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Egypt

Estonia

Finland

France

Germany

Honduras

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Hungary

India

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Ireland

Israel

Italy

Japan

Kenya

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Mexico

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Brunei
Bulgaria
Cambodia
Cameroon
Canada
Cayman Islands
Chile
China
Colombia
Costa Rica
Croatia
Cyprus
Czech Republic
Denmark

Dominica

Dominican Republic

Ecuador

Egypt

El Salvador

Estonia

Finland

France

Georgia

Germany

Ghana

Greece

Grenada

Guam

Guatemala

Honduras

Hong Kong

Hungary

India

Indonesia

Ireland

Israel

Italy

Jamaica

Japan

Jordan

Kenya

Kuwait

Latvia

Lithuania

Luxembourg

Macedonia

Malaysia

Malta

Mexico

Moldova

Monaco

Morocco

Netherlands

New Zealand

Nicaragua

Nigeria

Northern Mariana Islands

Norway

Pakistan

Panama

Paraguay

Peru

Philippines

Poland

Portugal

Puerto Rico

Qatar

Romania

Russia

Saint Kitts and Nevis

Saint Lucia

Saudi Arabia

Serbia

Singapore

Slovakia

Slovenia

South Africa

South Korea

- Spain
- Sri Lanka
- Sweden
- Switzerland
- Taiwan
- Thailand
- Trinidad & Tobago
- Tunisia
- Turkey
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- Uganda
- Ukraine
- United Arab Emirates (UAE)
- United Kingdom
- United States
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Upgrade discovery questionnaire

Export content with the Microsoft Teams Export API

Release notes for Teams admin features

Public preview in Microsoft Teams

Welcome to Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

If you're the admin for Microsoft Teams in your organization, you're in the right place. When you're ready to get going with Teams, start with How to roll out Teams.

If you're new to Teams and want to learn more, check out our short Welcome to Teams video (55 seconds).

Don't miss our Welcome to Teams for the Teams admin video (just over 3 minutes):

If you're looking for end user Teams Help, click **Help** on the left side of the app, or go to the Microsoft Teams help center. For training, go to Microsoft Teams Training.

Teams architecture

Teams is built on Microsoft 365 groups, Microsoft Graph, and the same enterprise-level security, compliance, and manageability as the rest of Microsoft 365 and Office 365. Teams leverages identities stored in Azure Active Directory (Azure AD). Teams keeps working even when you're offline or experiencing spotty network conditions.

To see where Teams fits in the context of Microsoft 365, check out this architecture poster: Teams as part of Microsoft 365

When you create a team, here's what gets created:

- A new Microsoft 365 group
- A SharePoint Online site and document library to store team files
- An Exchange Online shared mailbox and calendar
- A OneNote notebook
- Ties into other Microsoft 365 and Office 365 apps such as Planner and Power BI

When you create a team from an existing group, that group's membership, site, mailbox, and notebook are surfaced in Teams. To learn more, check out this poster: Groups in Microsoft 365 for IT Architects

To customize and extend Teams, add third-party apps through apps, bots, and connectors. With Teams, you can include people from outside your organization by adding them as a guest to a team or channel. As part of Microsoft 365 and Office 365, Teams offers a robust development platform so you can build the teamwork hub you need for your organization.

> **TIP**
> For a deep dive into Teams architecture, watch the videos on the Teams Platform Academy.

Managing Teams

As the admin, you'll manage Teams through the Microsoft Teams admin center. For a quick orientation, watch the Manage Teams using the Teams admin center video (3:03 min):

To learn more:

- Use Teams admin roles to manage Teams

- Manage Teams in the Teams admin center
- Manage Teams during the transition to the new Teams admin center
- Manage Teams features in your Microsoft 365 or Office 365

To stay on top of what's coming for Teams and all other Microsoft 365 or Office 365 products and services in your organization, be sure to check Message center and the Teams roadmap. You'll get announcements about new and updated features, planned changes, and issues to help keep you informed and prepared.

Upgrade from Skype for Business to Teams

Teams is the primary client for intelligent communications in Microsoft 365 and Office 365, and it'll eventually replace Skype for Business Online. To stay on top of new features coming to Teams, see the Microsoft 365 Roadmap. To complement persistent chat and messaging capabilities, Teams offers a comprehensive meeting and calling experience, with built in, fully integrated voice and video. Check out Teams is now a complete meeting and calling solution in the Microsoft Teams Blog.

If you're running Skype for Business and are ready to upgrade to Teams, or if you're running Skype for Business and Teams side-by-side and are ready to fully move to Teams, we have the tools, tips, and guidance to help make your transition successful. To learn more, see Upgrade to Teams.

Teamwork

Every team is different; there's no one-size-fits-all approach to collaboration. Microsoft 365 and Office 365 are designed to meet the unique needs of every team, empowering people to communicate, collaborate, and achieve more with purpose-built, integrated applications.

When deciding which Microsoft 365 or Office 365 apps and services to use, think about the work your organization does and the types of conversations your teams need to have.

- **Teams**, as the hub for teamwork, is where people - including people outside your organization - can actively connect and collaborate in real time to get things done. Have a conversation right where the work is happening, whether coauthoring a document, having a meeting, or working together in other apps and services. Teams is the place to have informal chats, iterate quickly on a project, work with team files, and collaborate on shared deliverables.
- **Outlook** for collaborating in the familiar environment of email and in a more formal, structured manner or when targeted and direct communication is required.
- **SharePoint** for sites, portals, intelligent content services, business process automation, and enterprise search. SharePoint keeps content at the center of teamwork, making all types of content easily shareable and accessible across teams. Tight integration with Outlook, Yammer, and Teams enables seamless content collaboration across conversation experiences.
- **OneDrive for Business** for storing files and sharing them with people that a user invites. Content that a user saves to OneDrive for Business is private until the user shares it with others, making it the best option for storing personal and draft documents that are not intended to be shared or not ready to be shared.
- **Yammer** to connect people across the organization. Drive company-wide initiatives, share best practices, and build communities around common topics of interest or areas of practice. Crowdsource ideas to foster open discussions with people across the company.
- **Office apps** are all the familiar tools that people know and use regularly, including Word, Excel, PowerPoint, and OneNote.

Teams content updates

See a weekly list of Teams topics that have been updated.

Teams known issues

See Teams Troubleshooting.

Teams client release notes

See What's new in Teams.

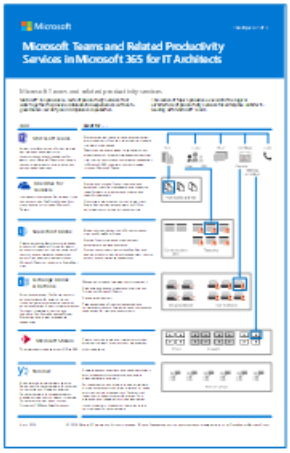
Microsoft Teams IT architecture and telephony solutions posters

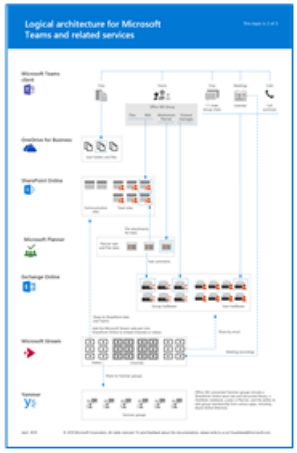
8/6/2020 • 2 minutes to read • Edit Online

Teams as part of Microsoft 365

Teams is central to the logical architecture of productivity services in Microsoft 365 - including data governance, security, and compliance capabilities.

This series of illustrations provides a view into the logical architecture of productivity services for enterprise architects, leading with Teams.

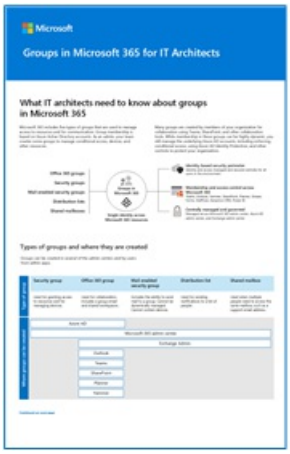




PDF | Visio

Groups in Microsoft 365

This is what IT architects need to know about groups in Microsoft 365. These illustrations detail the different types of groups, how they're created and managed, and a few governance recommendations.





PDF | Visio

Microsoft telephony solutions

Microsoft supports several options as you begin your journey to Teams in the Microsoft cloud. This poster helps you decide which Microsoft telephony solution (Phone System in the cloud or Enterprise Voice on-premises) is right for users in your organization, and how your organization can connect to the Public Switched Telephone Network (PSTN).

PDF | Visio

For more information, see the article for this poster: Microsoft telephony solutions

See Also

Microsoft cloud IT architecture resources

Download Microsoft Teams

Support remote workers using Microsoft Teams

9/23/2020 • 5 minutes to read • Edit Online

Does your organization want to use Microsoft Teams to support your users who work remotely or from home? Use the guidance in this article to get up and running quickly.

If you're a small or medium-sized business, don't miss Empower your small business with remote work.

IT admin guidance

- Make sure everyone has access to Teams with a paid subscription that includes Teams. As an option, eligible organizations can use the **Free version of Teams**, or employees can activate the **Teams Exploratory** experience.
- If you already have a subscription that includes Teams, **turn it on for everyone**.
- Understand how to get your organization started with **Meetings and live events in Teams**.

For more, read Additional resources for supporting remote workers below.

End-user communications

Ready to roll out Teams to your users? Get the **Customer Success Kit**, which contains these great email templates:

- Use the **Announcement Email** to tell users that Teams is available for them.
- Send **Countdown - Your First Day in Teams Email** to help users feel productive quickly.
- A few days later, send the **Tips and Tricks Email** to help your users get the most out of Teams.

End-user guidance

Share these assets and videos with your end users to help them get started quickly:

- Watch the **Welcome video** to get an overview of Teams.
- Download the **Quick Start Guide** to learn the Teams basics.
- Watch a series of short **Quick Start videos** for a walkthrough of Teams.
- Watch the **Meetings videos** to learn how to use meetings in Teams.

Additional resources for supporting remote workers

1. Read the FAQ: Support your remote workforce, which we're updating regularly.
2. Use Advisor for Teams to help you roll out Teams. Advisor for Teams (in the Teams admin center) walks you through your Teams deployment.
3. Read our recent blog posts:
   - How Microsoft is enabling its employees to work remotely with Microsoft Teams
   - Helping small and medium-sized businesses work remotely with Teams

- The top nine ways Microsoft IT is enabling remote work for its employees

4. Teams for Education

   - If you work in education and want to set up teachers, students, and administrators on Teams, use Office 365 A1. This free version of Office 365 is available to all educational institutions. Sign up at Get Office 365 free for your entire school.
   - Don't miss Get started with Teams for remote learning.

5. Make sure your employees have adequate internet access and bandwidth for Teams. Use the guidance in Prepare your organization's network for Teams to learn how to ensure adequate bandwidth.

   - Limited bandwidth can affect audio quality in Teams meetings. To ensure the best meeting experience under low-bandwidth conditions, encourage users to limit video and use PSTN for calls and meeting audio.
   - Read this timely blog (March 6, 2020), How to quickly optimize Microsoft 365 or Office 365 traffic for remote staff & reduce the load on your infrastructure.
   - March 26, 2020 blog: Running on VPN: How Microsoft is keeping its remote workforce connected
   - If you're in China, check out Microsoft 365 or Office 365 global tenant performance optimization for China users.
   - If you need help with troubleshooting or with fixing problems with call or meeting quality, then follow the guidance in Known issue - China: Dialing into Skype for Business/Teams conference IDs at the bottom of this article.

6. Security when everyone's working from home

   - Top tips for working more securely from home
   - Microsoft Security blog (March 26, 2020): Alternative ways for security professionals and IT to achieve modern security controls in today's unique remote work scenarios
   - Work remotely, stay secure—guidance for CISOs
   - Top 12 tasks for security teams to support working from home
   - Optimize Microsoft 365 or Office 365 connectivity for remote users using VPN split tunneling
   - Security and Teams goes into all the technical details of Teams security, as part of Microsoft 365 enterprise-grade security best practices and procedures.

7. Share a link to Teams video training to help your employees get the most out of Teams.

8. Go deeper: Learn more about rolling out Teams.

   - As a mid-sized organization (500-5000 users), start your Teams journey with live, interactive workshops.
   - Join one of our online classes to see Teams in action and get your questions answered.
   - Share in-depth training videos with users who want to learn more.
   - Read How to roll out Teams to learn how to get ready for and manage Teams.

9. Read our new content about working remotely and share it with your users:

   - Microsoft blog (March 10, 2020): Staying productive while working remotely with Teams
   - Work remotely with Teams

- Teams blog (February 28, 2020): Four tips for working from home with Microsoft Teams
- Collaborate with Microsoft 365 or Office 365
- Work remotely with Microsoft 365 or Office 365
- Nine tips for working remotely
- Satya Nadella and Teams Product Marketing Manager Aya Tange video about using Teams to work remotely (March 20, 2020)

10. Encourage everyone to install and use the mobile app: iOS or Android.

    > **NOTE**
    > If you're in China, go here to Get Teams for Android in China.

11. Use Teams to stay in touch with your employees:
    - Org-wide teams and Company Communicator app template.
    - Send out information about your org's work-from-home and health and safety policies.
    - Use Live events for company-wide meetings and outreach. If your meeting reaches the Limits and specifications of a Teams regular meeting, then make it a live event. Turn on live captions for meetings and live events. Turn on subtitles in live events. These features increase inclusivity, productivity, and comprehension.
12. Staff up your helpdesk to deal with user inquiries.
13. If you're new to the Teams admin role, check out Admin training for Teams.
14. Make sure your users have the devices they need to be seen and heard clearly. Check out Teams-certified devices for personal and shared spaces.

Known issue - China: Dialing into Skype for Business or Teams conference IDs

The following is a summary of a Feb 7, 2020 Message center post (MC203397):

Microsoft understands that some users in the China region are experiencing issues dialing into Skype for Business or Teams conference IDs. In most cases, these problems are external to systems under our control. Often, the issue is with local mobile and telephony carriers.

We recommend the following if you're having audio conferencing problems:

- Ask the caller or meeting organizer to call your PSTN or mobile number.
- Join the call or meeting from the desktop or mobile clients, using VoIP.

If you need to log a support ticket, include the following items:

- Exact time of call
- Conference bridge number dialed
- Caller phone network
- Caller phone number

Microsoft Teams training

12/5/2020 • 2 minutes to read • Edit Online

	Admin training Use these tutorials, videos, and other training resources to learn about Teams and drive usage in your org.
	Teams live training Microsoft-hosted free, live, online training classes designed to get you up and running with Teams. Join us to see Teams in action, get your questions answered, and interact with our live instructors.
	Teams online training Use these self-paced training resources to help users in your get the most out of Teams.

Don't miss these key training offerings

Check back frequently - we'll keep updating this list so you'll always know about the latest, coolest, most important Teams training.

Support remote workers

Get the guidance you need - including links to training - to support your users who are working from home.

Teams Essentials for IT

Microsoft Mechanics "Teams for IT" video series shows you - the admin - how to roll out, configure, and manage Teams.

Teamwork

Course: Enabling Teamwork with Teams

Adoption specialist certification

The Microsoft Service Adoption Specialist Certification course features Teams. Learn how to drive adoption of Microsoft services in your org.

Introduction to teamwork in Microsoft 365

Learn about the Microsoft 365 tools that facilitate teamwork for all workers, no matter where they're located or how they connect to your org.

Microsoft 365 Certified: Teamwork Administrator Associate

Microsoft 365 Teamwork Administrators configure, deploy, and manage Microsoft 365 or Office 365 workloads, such as SharePoint (online, on-premises, and hybrid), OneDrive, and Teams.

Getting started with admin training for Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

Use the training resources to educate yourself about Teams, teach others or run workshops. Check back here often for new content.

	Get started fast with a couple of teams and channels		Get training for your users
	View best practice and how-to videos in the Coffee in the Cloud channel on YouTube		Teams Chalk Talks: learn best practices and practical guidance around popular Teams scenarios

Technical training

MODULE	VIDEO	POWERPOINT DECK
Microsoft Mechanics - Teams Essentials for IT YouTube channel	Video: Teams Essentials for IT (10:13 min) Video: Deploy & Configure Teams - Intro (8:22 min) Video: Security and Compliance (12:42 min) Video: Teams Controls for Security and Compliance (10:54 min)	
Foundations - Core Components	Video	Deck
Windows Desktop Client	Video	Deck
Governance, management and Lifecycle	Video	Deck
Security & Compliance	Video	Deck
Call Quality Overview	Video	Deck
Meetings introduction	Video	Deck
Media - Why meetings are simple	Video	Deck
Media - Media flow	Video	Deck
Dynamic emergency calling	Video	Deck
Live Events	Video	Deck

MODULE	VIDEO	POWERPOINT DECK
Phone System introduction	Video	Deck
Direct Routing	Video 1: Planning for Direct Routing in Teams Video 2: Configuring and Managing Direct Routing in Teams Video 3: Migrating to Direct Routing in Teams	Deck
Upgrade from Skype for Business to Teams	Video 1: Introduction to Upgrade Video 2: Plan your upgrade Video 3: Coexistence and Interoperability Video 4: Administrator experience	Deck

Teams Rooms Foundations for IT & AV Pros

The following table contains links to comprehensive video training, with accompanying PowerPoint decks (in PDF format), on Microsoft Teams Rooms.

MODULE	VIDEO	POWERPOINT DECK (PDF)
Module 1: Introduction to Microsoft Teams Rooms (18:29 min)	Video	Deck
Module 2: Microsoft Teams Networking (34:10 min)	Video	Deck
Module 3: Choosing the right device for the right space (18:45 min)	Video	Deck
Module 4: Deploying Microsoft Teams Rooms (56:36 min)	Video	Deck
Module 5: Configuring and starting Microsoft Teams Rooms (32:27 min)	Video	Deck
Module 6: Managing Microsoft Teams Rooms, Part 1 (18:31 min)	Video	Deck
Module 7: Managing Microsoft Teams Rooms, Part 2 (41:06 min)	Video	Deck
Module 8: Microsoft Teams Rooms -- Tips, tricks, and troubleshooting (18:14 min)	Video	Deck
One-touch Join Instructions		Deck

Interactive guides

TITLE	ABSTRACT	LINK TO THE GUIDE
Identity, Access management & Threat Protection for Teams	Learn how to use Microsoft admin centers and PowerShell to configure access and identity policies and Enable Office 365 Advanced Threat Protection for Teams	Teams security guide
Managing Compliance in Teams	Use the Microsoft 365 Security, Microsoft 365 Compliance, and Microsoft Teams admin centers, as well as Windows PowerShell to manage and configure an Office 365 organization's Microsoft Teams policies and settings.	Managing compliance in Teams guide
Teams Advisor: Deploying chats, teams, channels and apps in Microsoft Teams	Learn how to leverage Teams advisor to assess your environment and build a plan for deploying chats, teams, channels and apps.	Teams Advisor guide
Streamlining Teams administration with PowerShell and dynamic groups	Convert an Office 365 group from static membership to dynamic and use Windows PowerShell to assign a new App permission policy to all members.	Streamlining Teams administration guide
Managing Teams and Guest Access in the Microsoft Teams admin center	Learn how to configure and manage Microsoft Teams and guest access for your organization.	Managing Teams and guest access guide
Configure Teams Phone System: Auto Attendant & Call Queue	Step through the process of creating and deploying a Call Queue and Auto Attendant as part of Microsoft Teams calling using the Microsoft Teams admin center.	Configure Teams phone system guide
Configure Direct Routing: connecting SBCs and voice routing	Use Microsoft Teams Phone System Direct Routing to integrate with your existing telephony infrastructure.	Configure direct routing guide
Configure Governance in Microsoft Teams	Learn how to create a Teams messaging retention policy for your organization and how to archive, delete and restore individual Teams	Configure governance in Microsoft Teams guide
Configuring and deploying Microsoft Teams meetings	Step through the process of deploying the meetings workload for Microsoft Teams.	Configuring and deploying Microsoft Teams meetings guide
Configure Audio Conferencing for Microsoft Teams	Discover the capabilities of Audio Conferencing in Teams and learn how to assign conference bridges and dial-in phone numbers.	Configuring audio conferencing for Microsoft Teams guide
Configuring Microsoft Teams for Firstline Workers	Learn how to configure and deploy the right Microsoft Teams environment for your Firstline Workforce.	Configuring Microsoft Teams for Firstline Workers guide

Quick start guides

- Quick start: Teams for Education admins
- Quick start: Configuring Calling Plans in Teams

Tutorials

- Tutorial: Meetings in Teams
- Tutorial: Audio Conferencing in Teams
- Tutorial: Understand calling in Teams

Courses

- Enabling Teamwork with Microsoft Teams
- Microsoft Service Adoption Specialist

Teams sessions at Ignite 2020

11/2/2020 • 15 minutes to read • Edit Online

Watch these sessions to get the latest Teams news, announcements, and technical skilling content from Digital Ignite 2020.

Key segments

TITLE	ABSTRACT	SPEAKERS
Creating a resilient, inclusive, and hybrid workplace with Microsoft Teams	Organizations are moving to a hybrid workplace to support the needs of remote and onsite employees. In the 1st part of a 2-part series, we'll demonstrate how teams can stay connected through Teams meetings, virtual events, and calling, along with new device experiences. We'll also show how the Teams platform can help streamline workflows, improve decision making, and integrate your ecosystem of applications directly in Teams. Also check out the 2nd part of this series, session code DB158.	Nicole Herskowitz
Meet smarter, stay focused, and achieve more with Microsoft Teams meetings	Meetings are the cornerstone for how works gets done. Learn how Teams meetings can help you and your organization be more productive while adapting to a new way of working.	Shiraz Cupala
Microsoft Teams Calling Made Simple	Enterprise Calling in Teams is simple to deploy and use. Learn the basics of Teams Calling while finding out the latest in Calling such as new calling experiences and collaborative calling.	Paul Cannon, Laura Kramer, Barbara Kim
One place for admins to manage Microsoft Teams: What's new in Teams manageability	Teams admins have flexible and granular management capabilities to craft a custom experience for their organizations that best meets the needs of the business. In this session we will introduce the latest and greatest capabilities around our Team Admin Center portal, discuss what's new in policies , app management, device management, reporting, analytics and troubleshooting and PowerShell.	Ronit Ben-Sheffer, Jamie Stark

TITLE	ABSTRACT	SPEAKERS
Scale and Customize Virtual Meetings and Events with Microsoft Teams	Meetings come in all shapes and sizes - learn how to best utilize Teams to structure and manage your next large event. Teams can seamlessly scale with your organization's needs, providing ways to customize and deliver optimal attendee experiences for events of all sizes.	Christina Torok, Ashwin Appiah
Power modern meeting experiences across the hybrid workplace using Microsoft Teams devices	Introduction to Microsoft Teams devices. Teams devices are designed to help peoplemaximizethe power of Teams and bridge the gap between remote and shared workspaces. Learn about the devices designed to deliver people-centric meeting room experiences and re-imagined personal workspaces enabling more inclusive and collaborative experiences with Microsoft Teams devices.	Kendra Baker, Greg Baribault
Transforming the modern workplace with Microsoft Teams Platform	Learn about all the new and existing extensibility points within the Teams platform and how you can create powerful apps and solutions to solve your business needs.	Archana Saseetharan, Michal Lesiczka
Reimagining work with the Microsoft 365 Platform	The Microsoft 365 platform helps organizations tailor every facet of their environment to help people work and collaborate better. Discover how every app can go further by adding insights and relevant data from Microsoft Graph, and how every app can integrate with the flow of work across apps, including Microsoft Teams. See how apps can deliver unique, engaging experiences across devices. Take advantage of key building blocks that can speed app creation.	Yina Arenas, Mike Ammerlaan
Simplify work with low-code solutions for Microsoft Teams & Microsoft 365	Teams and Microsoft 365 are platforms for everyone, even if you don't have any professional development experience. Come see how low-code innovations for Teams and Microsoft 365 are making it easier for teams to build and use custom apps, bots, automation, and data to address challenging business processes.	Karan Nigam, Weston Lander

TITLE	ABSTRACT	SPEAKERS
What's new in Microsoft Teams security and compliance	Enabling secure, remote work is top of mind. In this session, learn about the latest Teams features and functionalities across security and compliance. We'll cover how to leverage the intelligence and strength of Microsoft 365 within Teams to keep your organization secure and compliant. Topics include keeping your information protected against data leaks, enabling safe and inclusive meetings, and maintaining a compliant organization across world-wide regulations and business requirements.	John Gruszczyk

Pre-recorded sessions

Meetings, Calling, and Devices

TITLE	ABSTRACT	LEVEL	SPEAKERS
Innovation in Teams meetings and devices with intelligence	We are continuously innovating and re-imaging meetings. Join us to learn about how we are continuously bringing more intelligence in meetings and our latest innovation in devices that bring intelligence to life.	200	Shalendra Chhabra
Advanced calling capabilities	Go deeper with Calling as we explore the new calling experience, further information on Collaborative Calling, e911, Location Based Routing and other features. Learn how Calling is ready for your advanced scenarios no matter the size of your company.	200	Alan Xie, Roy Kuntz

TITLE	ABSTRACT	LEVEL	SPEAKERS
Microsoft Teams devices for shared spaces	Microsoft Teams devices are designed to help people maximize the power of Teams and bridge the gap between remote and shared workspaces. Through a combination of Teams meetings features, customer-centric room experiences, and industry leading hardware, users benefit from low-friction, inclusive, and interactive meetings, whether they join remotely or in the meeting room. Learn how shared space devices like Microsoft Teams Rooms, collaboration bars and Surface Hub can help your teams stay connected and collaborative across the hybrid workplace.	200	Greg Baribault, Kendra Baker, Sandhya Rao
On Skype for Business? Design your path to Microsoft Teams	Join this session to learn and determine the most suitable approach based on your current Skype for Business implementation and business goals. Whether you are a Skype for Business Online or Server customer, we will share best practices, resources and guidance to get to Microsoft Teams today.	200	Lisa McKee, Laszlo Somi
Modern innovation in Teams personal devices	Customers are looking for the right personal devices for Teams, especially as many of their employees are working remotely. Join us to learn about new innovations in Teams personal devices, our momentum in features and certified devices, and our best practices for remote work.	200	Sandhya Rao, Arash Ghanaie-Sichanie, Kruthika Ponnusamy
Master virtual breakout rooms in Microsoft Teams meetings	Join us to learn about the latest innovations with virtual breakout rooms in Teams. In this session we'll highlight use cases and best practices for facilitating small group ideation, brainstorming, learning, and discussions with virtual breakout rooms.	200	James Skay, Nakul Madaan

TITLE	ABSTRACT	LEVEL	SPEAKERS
Make your Teams meetings safe and inclusive with meeting and video conferencing controls	Join this session to learn more about meetings safety, security and moderation – including the ability to hard mute all attendees, request to speak functionality and configuring breakout rooms. We will also cover features like reactions and raised hands that can help make meetings more inclusive.	200	Nakul Madaan, Rajiv Ramaiah
Microsoft Teams Calling and Meetings as a platform	Learn about the Teams Calling and Meetings platform capabilities with updates to Microsoft Graph Cloud Communications APIs, Contact Center, and Compliance Recording and coming news in other platform experiences.	200	Srividhya Chandrasekaran, Mansoor Malik
Leverage Teams to deliver engaging virtual events for your employees, customers and communities	Join this session to learn how Microsoft Teams can seamlessly scale to help deliver events of all types, from company townhalls, to training webinars, to online conferences. We will also share vision and roadmap for features to help scale and customize your virtual meetings and events.	200	Christina Torok, Ashwin Appiah
Best practices for delivering more efficient and impactful meetings with Microsoft Teams	Teams Meetings are evolving and integrating deeply in the continuum of collaboration. Making meetings more productive, secure, and inclusive, innovation in Teams will help you better prepare, execute, and streamline meetings. In this session we'll showcase best practices to help you get the most of your meetings and stay in the flow of work.	200	Shiraz Cupala

Deployment, Management, and Security

TITLE	ABSTRACT	LEVEL	SPEAKERS

TITLE	ABSTRACT	LEVEL	SPEAKERS
Driving Adoption with Virtual Events: Best practices for organizers and producers	This real world lessons session will review our Virtual Event Playbook for event organizers and IT professionals. Learn what you need to know from Karuana Gatimu, technical producer of key flagship events for Microsoft Teams Engineering during the initial stages of the pandemic. Hear guidance gathered from the Microsoft transition to virtual events and how you can use Teams Meetings and Live Events to deliver compelling events that keep your organization connected.	300	Karuana Gatimu, Ashwin Appiah
Deep dive on governance for Office 365 Groups and Microsoft Teams	View this hands on demonstration of governance capabilities and tools that will manage your end-users experience of Microsoft Teams and allow you to feel confident about the security and compliance of your information. Includes configuration of Azure Active Director add-on capabilities.	300	Karuana Gatimu
Driving Industry Adoption - Special scenarios and features for firstline, non-profit, healthcare and more.	In this scenario driven session we will review features, both existing and new, in the context of the IT professionals who must deliver on them. Including end-user and ITPro templates, mobile features	200	Karuana Gatimu, Kathy Minnis
So are you ready to deploy Microsoft Teams?	In this session we will walk through all the key products and resources that can help you to ensure your Teams rollout is successful. From tools and resources to best practices, this session is a must attend if the planning and deployment of Teams is on your to-do list!	300	Stephen Rose
Teams Deployment and Microsoft End Point Manager	View hands on demonstrations around best practices to help you deploy and manage Microsoft Teams via End Point Manager	300	Mayunk Jain, Mayank Verma

TITLE	ABSTRACT	LEVEL	SPEAKERS
Essentials for managing Microsoft Teams; Advanced manageability controls	Microsoft Teams is designed with IT in mind, providing management capabilities for collaboration, meetings, callings, and apps. Explore the full range of management features available for configuring, managing, and monitoring Microsoft Teams. We'll walk through the full scope of controls - from enabling a smoother onboarding experience to ongoing maintenance and optimization of your environment.	200	Ronit Ben-Sheffer, Jamie Stark
Managing Security and Compliance in Microsoft Teams	Delivering a secure collaboration experience is essential. Join us for a review of the security and compliance features for Microsoft Teams from an ITPro perspective. Policy management, content management, retention procedures, communication compliances, and more will be covered. Come see the full compliment of capabilities for secure, compliant collaboration!	300	John Gruszczyk
Microsoft Teams Device Management Essentials	The Windows AI Platform provides ML professionals with the OS infrastructure they need in order to successfully build and deploy ML experiences on Windows. Windows ML, the platform's inferencing API, is revolutionizing how Windows developers deploy and execute ML models by introducing an easy-to-use interface that simply works on any Windows device. Learn to use the newly available Windows ML redistributable package, leverage DirectML in your ONNX Runtime usage on Windows and get the info you need to set up the preview enabling GPU based ML training workloads inside the Windows Subsystem for Linux.	200	Kyle Spiess, Sid Roy

TITLE	ABSTRACT	LEVEL	SPEAKERS
Create devops workspaces in Microsoft Teams	See how you can leverage Microsoft Teams and apps to build a hub for your DevOps teams.	200	Sid Uppal

Collaboration

TITLE	ABSTRACT	LEVEL	SPEAKERS	
Microsoft Teams Mobile App: What's new & What's Next	Check out what's new and what's coming next across the Microsoft Teams mobile clients.	100	Marissa Salazar	
Driving wellbeing and inclusion with Microsoft Teams	To be at their best, people need to feel included, encouraged to be present during their personal time, and empowered with the right tools to set them up for success in their role. Learn how Teams can power inclusive teamwork by ensuring everyone can collaborate in the way that works best for them while also balancing work and life.	100	Chris Bryan, Ali Oberg	
Collaborate inside and outside your organization with chat and channels in Microsoft Teams	Instant messaging remains one of the most efficient means of communication, but without appropriate planning it can limit who can participate. Learn how you can best leverage chat and channel conversations to foster more open collaboration with people inside and outside your organization. We'll discuss the differences, best practices, and upcoming features in this area.	200	Karuana Gatimu, Luis Escobar Reyes, Somak Bhattacharyya	

Platform

TITLE	ABSTRACT	LEVEL	SPEAKERS	
Digitize and transform business processes with no-code building blocks and app templates in Microsoft Teams	Organizations are already transforming many of their business processes on Teams – from approvals and task management, all the way to crowd sourcing the organization for top ideas. Learn how to use embedded building blocks and production-ready app templates to digitize and streamline key processes. In this session we'll share how customers are leveraging these solutions without any custom development required, as well as how some recent innovations can help simplify these processes	200	Wes Lander, Aditya Challapally, Christopher Bryan	
Build richer meetings experiences with Microsoft Teams apps using new meetings extensibility points	Learn how developers can use new meetings extensibility points to integrate their Teams apps across the meetings surfaces – enabling apps to be used throughout the meetings lifecycle (pre, during, post) and provide users a richer collaboration experience within meetings.	300	Rajesh Rangarajan, Isabella Lubin	

TITLE	ABSTRACT	LEVEL	SPEAKERS	
Navigating the Teams app lifecycle	Understand the tools you need to securely and efficiently manage the Teams app lifecycle from developers to IT admins and, finally, end users. We'll cover Teams app development, validation, submission, configuration, permissions, and deployment that will help you navigate app management and adoption.	300	Joey Glocke, Vaibhav Agarwal	
Explore how to integrate and power mobile experiences in your Teams apps	Collaborating through mobile devices continue to be a critical component of how we get work done today. Whether you use mobile as a companion experience or as your primary means, Teams offers all the features you need to stay on top of your work, keep in touch with your team and be productive. Join us to learn about what's new and coming soon as we cover Personal apps on Mobile and Mobile Device capabilities you can use to build Mobile first apps for your employees.	300	Anuj Bahl, Vikramjit Singh Chug	
Build custom apps, bots, and automation for Microsoft Teams with low-code capabilities	Learn how to get started building custom solutions for Teams. We'll go deeper into the Teams + Power Platform integration to show how user can create custom digital tools - even if they have no developer experience	300	Pete Daderko, Geneve Estrada	

TITLE	ABSTRACT	LEVEL	SPEAKERS	
Elevate user experiences with Teams and Adaptive Card	Teams platform with Adaptive Cards enables building beautifully integrated and actionable user experiences in Teams. In this session, we'll cover how developers can leverage new capabilities to build contextual and compliant experiences that elevate collaboration in Teams.	300	Suryamanohar Mallela, Shubham Chauhan	
Tips and Tricks: Best practices and common challenges when building Microsoft Teams apps	Join us for a session where we cover some common challenges developers run into as they build Teams apps. Developers will leave this session with tips and insights they can use as they continue their Teams app development journey.	400	Adrian Solis, Erin Bailie	
Building friction-free apps & enabling seamless adoption using authorization and authentication capabilities and Microsoft Graph	Develop apps with powerful capabilities like Single Sign-On (SSO), Resource-Specific Consent (RSC), granular permissions, and where IT Admins can learn how to leverage Graph APIs to automate app lifecycle/management.	400	Nick Kramer	

Industry

TITLE	ABSTRACT	LEVEL	SPEAKERS	

TITLE	ABSTRACT	LEVEL	SPEAKERS	
Deployment and governance of Teams for Education	Understand everything you'll need to know for holistic governance for your educational institution. In this session we'll cover chat policies, meeting policies, app policies, assignments through groups, how to configure student safety, and methods for automating team class creation.	300	Jethro Seghers	
Virtual health and collaboration with Microsoft Teams in healthcare	Learn how healthcare organizations can help empower health teams to provide the best possible care with Microsoft Teams. This session will focus on virtual health and health team collaboration and dives deep into areas like the latest announcements for Teams in healthcare, virtual visits, customer stories, and more. You'll also learn how to use Microsoft Teams as a platform for addressing many current healthcare scenarios.	200	Evan Westenberger, Tom McGuinness, Kristina Behr, Daniel Canning	
Tailor Microsoft Teams for your Industry	In this session we will share details about how to bootstrap your collaboration experiences with Templates through our Industry Gallery, customize those templates to your organization needs and deploy them to various parts of our organization and simply management through policy packages.	200	Prem Kuchi, Aaron Glick	

TITLE	ABSTRACT	LEVEL	SPEAKERS	
Collaboration and Communication using Microsoft Teams in Government	State, local and federal agencies have leverages Microsoft Teams to increase their ability to collaborate and improve their response times and citizen engagement. Learn how to maximize your use of existing features, what's coming next and our future vision for Microsoft Teams in government.	200	Rima Reyes, Karuana Gatimu, Roxy Ndebumadu, Sarah Gilbert	
Integrate with Microsoft Teams for Education App Platform	Teams is an open platform for educational institutions to integrate apps and create custom workflows. In this session we'll cover how the Teams app store is used across classroom teaching to integration with IT help desks. Learn about 3rd party app governance, open source app templates, and a hands-on example of App Studio to create a quick custom website app for your institution.	300	Dominic Williamson	
Remote and hybrid learning with Teams for Education	In this session, we'll go in depth on everything you need to know for remote and hybrid learning, including how to create online meetings with the right meetings options and policies, how to create class teams through automation, and how to support collaborative classroom environments.	200	Juliano Menegazzo Souza	

Firstline Worker

TITLE	ABSTRACT	LEVEL	SPEAKERS
Enable Business Continuity for your Firstline Workforce with Microsoft Teams	As organizations continue to adjust their operations and workforce to maintain business continuity, new capabilities in Microsoft Teams help Firstline Workers stay focused on meeting customer needs.This session will focus on Shifts, Tasks and core communication along with Walkie Talkie capabilities to create a secure and centralized user experience that saves youtime and money.	200	Scott Morrison, Zoe Hawtof
Deploy and Manage Teams Enabled Devices to Meet the Diverse Needs of your Firstline Workforce	Learn how to deploy Firstline specific devices that enable new ways for workers to focus on the job in front of them. This walkthrough will include scenarios for Teams Walkie Talkie and hands-free collaboration.	200	Abid Chaudhry, James Ellis
Manage Distributed Firstline Workforceswith Capabilities in the Microsoft 365Admin Center	Discover best practices and practical guidance around popular IT deployment and management scenarios in Microsoft 365 for Firstline Workers. Learn how to build the right experience in Microsoft Teams and successfully rollout the solution to support your Firstline workforce.	300	Irina Parsina, Zoe Hawtof

How to roll out Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

Start here

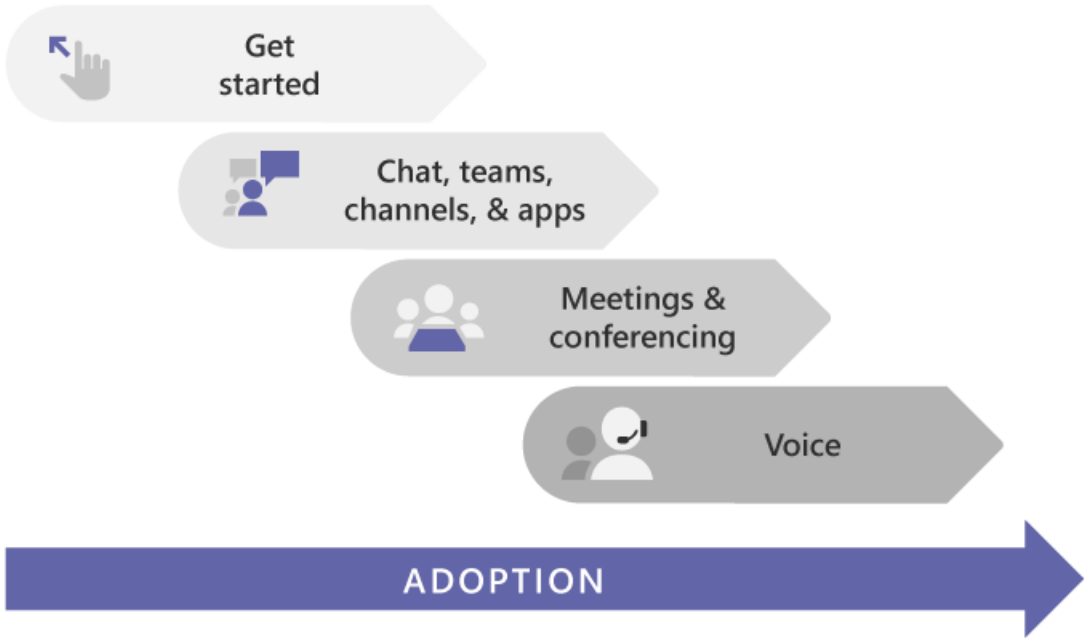
Whether you're a small business or a multi-national, the place to start for rolling out Teams is Get started. It walks you through a small-scale Teams rollout, which may be all you need if you're a small business, or if you're rolling out Teams quickly as your first Microsoft 365 or Office 365 workload to support **remote workers**. If you're a larger organization, use Get started to pilot Teams with a small group of early adopters so you can learn about Teams and start planning your org-wide deployment.

Recommended path to Teams

We recommend rolling out Teams in stages, workload by workload, as your organization is ready. **You don't have to wait until you've completed one step before you move to the next.** Some orgs may want to roll out all Teams features at once, while others may prefer a phased approach. Here are the Teams workloads, in the order we recommend rolling them out:

- Get started
- Chat, teams, channels, & apps
- Meetings & conferencing
- Cloud voice

Adoption hub: Throughout your Teams rollout, be sure to take advantage of these resources to help drive Teams adoption.



If you're starting from Skype for Business, on-premises, or hybrid deployments

If you're coming to Teams from Skype for Business (online or on premises), or if you need a hybrid configuration, you still want to follow the recommended path above for a Teams deployment, but first you need

to do some extra planning. Start by reviewing the guidance in the table below that applies to your organization's profile.

	YOUR ORGANIZATION'S PROFILE	GUIDANCE
	I'm currently using Skype for Business Online, and I'm ready to move to Teams.	Go to Upgrade to Teams.
	My organization is running Skype for Business Server, and I want to roll out Teams.	For a full-scale Teams rollout, first you need to configure hybrid connectivity between your on-premises environment and Microsoft 365. Start by reading Plan hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365. You should also review Upgrade to Teams.
	I don't have Skype for Business Server, but I do have an on-premises PSTN solution. I want to roll out Teams, but I want to keep my on-premises PSTN solution.	Roll out Teams following the recommended path above. Then read Plan Direct Routing to learn about using Phone System Direct Routing to hook up your on-premises PSTN solution with Teams.

Get started with Microsoft Teams

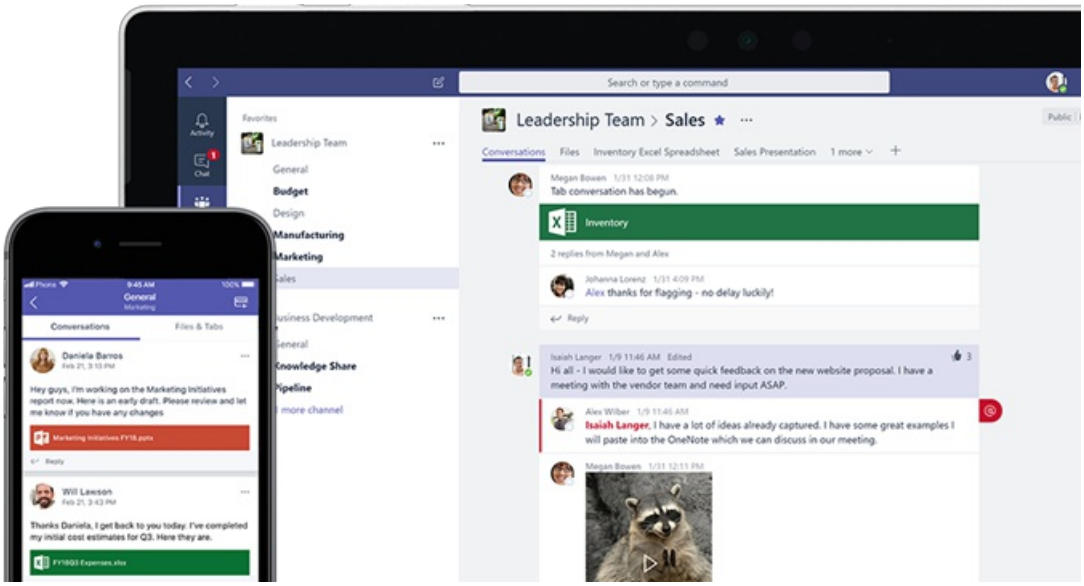
12/5/2020 • 3 minutes to read • Edit Online

IMPORTANT

If you're rolling out Microsoft Teams quickly in response to an increased demand to support **remote work**, use this Get started guidance to roll out Teams to your entire organization. This guidance applies, even when Teams is your first Microsoft 365 or Office 365 workload.

To get started quickly on Teams, we recommend you create two or three teams and channels for a select group of early adopters. By first rolling out Teams on a small scale, you'll learn Teams by using Teams and gain valuable insights to inform how you deploy Teams across your whole organization. If you're a small business, this Quick start guide is all you need to roll out Teams to your whole organization.

Teams lets you quickly pull together a team with people inside and outside your organization, chat with others to drive fast and inclusive conversations, securely share and coauthor documents, and iterate on projects. Customize Teams by adding fingertip access to shared notes, webpages, and apps. Use meetings and calling to collaborate in real time from wherever users are. Teams will simplify your access to Microsoft 365 or Office 365 services and third-party apps to be the new center of gravity for your collaboration and communication needs. Encourage your early adopters to install both the desktop and mobile applications for the best experience and most accurate feedback.



Here's how to roll out your first set of teams and channels so your early adopters can start chatting, sharing files, and collaborating.

- Step 1: Create your first teams and channels
- Step 2: Onboard early adopters
- Step 3: Monitor usage and feedback
- Step 4: Get resources to plan your organization-wide rollout

If you're a large organization, have a hybrid or on-premises Skype for Business configuration, have strict regulatory or compliance requirements, or if you want to roll out meetings or voice features (such as calling plans or phone system), start by reading How to roll out Teams. We recommend you still begin with this **Get started** section to build your skills and start planning your org-wide deployment. "Plan Teams with Teams." Start small by

rolling out Teams with chat, teams, channels, and apps and build from there. These initial experiences will help you spread the word about Teams, generating excitement throughout the organization for your next launch phase.

If you're a small business, or if **you're rolling out Teams quickly to support a newly remote workforce**, use this Get started guidance to fully roll out Teams in your organization. Be sure to check out the templates that are available specifically for small business to make deployment in your organization easier and more streamlined. See Get started with Teams templates for Small and Medium Businesses.

Before you get started

To get ready for your Teams rollout, here's what you need to do, whether Teams is your first workload ("Teams First") or the next workload in an existing Microsoft 365 or Office 365 deployment:

- Prepare your organization's network for Teams
  - This includes configuring your Microsoft 365 or Office 365 domain, SharePoint Online, Exchange Online, and OneDrive for Business.
- Get Teams licenses for everybody. Check out Teams plans and Microsoft Teams service description.
- Learn about the benefits of installing the desktop, web, and mobile clients
- Starting from on-premises Skype for Business or Lync Server
  - Upgrade from Skype for Business on premises to Teams
  - Plan hybrid connectivity between Skype for Business Server and Office 365

> **NOTE**
> If your organization is running on-premises Skype for Business Server (or Lync Server), you must Configure Azure AD Connect to synchronize your on-premises directory with Microsoft 365 or Office 365.

Next steps

Create your first teams and channels

Learn more with our interactive Teams Adoption Guide.

Create your first teams and channels in Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

Setting up and using your first set of teams and channels builds your experience with Teams and identifies champions who can help drive Teams adoption across your organization. If you haven't installed Teams yet, check out Get Teams clients and Sign in to Teams using modern authentication.

Suggestions for your first teams and channels

A team is a collection of people who gather together around a common goal. Channels are the collaboration spaces within a team where the actual work gets done.

To learn more, see Overview of teams and channels in Teams and Best practices for organizing teams in Teams.

We suggest you start with a "Get to know Teams" team where your early adopters can play around, ask questions, and discover the capabilities of Teams. This team can be essential to your success as you begin to experiment with Teams.

"Get to know Teams" team

Your project team can use the "Getting to know Teams" team to ensure they're set up with Teams clients, have some initial conversations, and explore what Teams can do. You may already have a group of people in your organization who enjoy getting early access to new capabilities. This can be one of their initial teams when you bring them on board and will help you get early feedback.

Here's a suggested structure for the team.

CHANNEL	DESCRIPTION AND USAGE	PINNED TABS, BOTS, AND APPS
General	All teams start with a General channel. Use this channel to make announcements as you start getting to know Teams.	
Say hi	Introduce yourself to the team and share what you want to get from Teams.	
How do I	A channel to ask how-to questions. Step 1 – install the desktop and mobile clients. Step 2 – jump into Teams.	Pinned tab that links to the Teams help center Pinned tab that links to Teams training videos Pinned tab that links to Teams desktop and mobile client download links
Feedback	Share your thoughts on your Teams experiences.	Pinned tab with Polly Poll
Ideas for future teams	Share your thoughts on where Teams can drive additional value in your organization. What could these teams be called? Who would be members?	

CHANNEL	DESCRIPTION AND USAGE	PINNED TABS, BOTS, AND APPS
Support	If something isn't working as expected, use this channel to get help.	

Get your first teams up and running

As an admin, you can create and manage teams and channels in the Teams client or the Microsoft Teams admin center. You can create teams as public or private. You can also create an org-wide team. Anyone using Teams in your organization can join a public team. For private teams, team owners manage team membership. And for an org-wide team, everyone in your organization is automatically added.

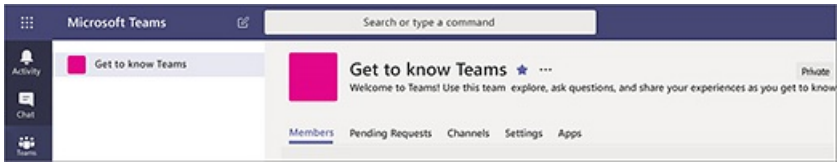
To get started, we recommend you create private teams and add another owner to manage team settings and membership.

> **NOTE**
> In the steps that follow, we use the Teams desktop client to create teams and channels. Keep in mind that as an admin, you can also do these tasks in the Microsoft Teams admin center.

Create a team

On the left side of Teams, click **Teams**, at the bottom of the teams list, click **Join or create a team**, and then click **Create a new team**.

Once you've created the team, invite people to join it. You can add individual users, groups, and even entire contact groups (formerly known as "distribution lists").

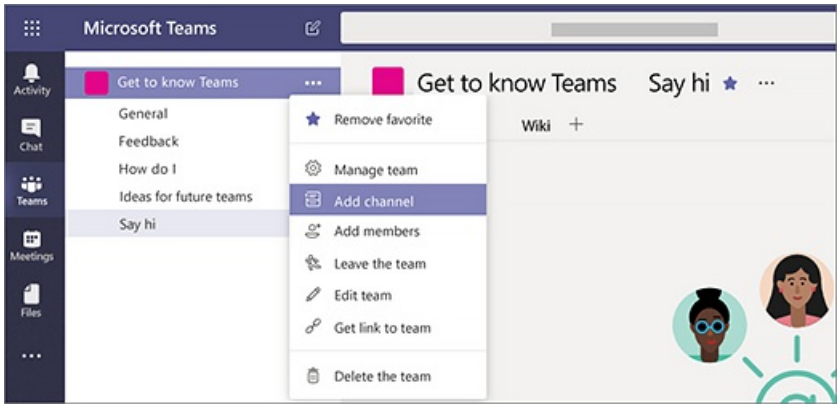


Add a team owner

Find the team that you created, click **More options úúú** > **Manage team**. Then go to the **Members** tab. Find the people you want to designate as team owners. Under **Role**, click **Owner**.

Create a channel in a team

Find the team that you created, click **More options ...** > **Add channel**. You can also click **Manage team** and add a channel in the **Channels** tab.

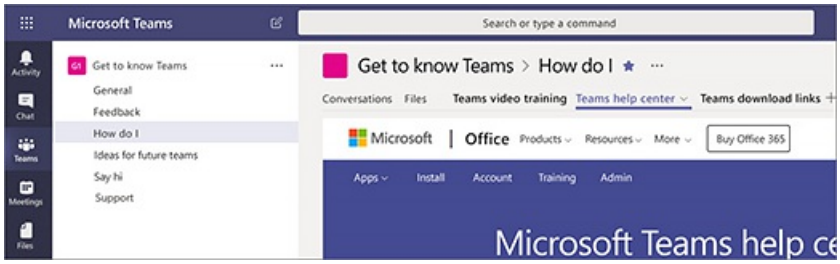


Give the channel a descriptive name to make it easier for users to understand the purpose of the channel.

As a team owner, you can automatically favorite channels for the whole team, making the channels more visible for

everyone on the team. You can also pin tabs to the channel to add tools, such as OneNote, links to webpages, and other content to make it easy for users to find what they need and share their thoughts.

Here's an example of the "How do I" channel in the "Get to know Teams" team, showing pinned tabs that link to Teams webpages – Teams video training, Teams help center, and Teams download links.



Next steps

Go to Onboard your early adopters.

Onboard early adopters to Microsoft Teams

12/5/2020 • 5 minutes to read • Edit Online

Invite users to Teams

Send a welcome email to users with the names and descriptions of the teams you created and invite them to join the conversations in Teams. Be sure to include the following links in the email so they know where to get Teams clients, training, and support:

- Teams web client
- Desktop and mobile client download links
- Teams training videos
- Teams Help documentation

For example, for the "Get to know Teams" team, you might want to start your email like this:

```
Welcome to Microsoft Teams for <insert_company_name>. Teams is a chat-based workspace that brings together
chat, files, people, and tools in one place.

We created a team called "Get to know Teams" to get you started. Use it to experiment, ask questions, and
discover the possibilities of Teams.

To join, click <link to the team>.
```

Engage with users when they first join. Post a welcome message in Teams and start a chat in a channel. Doing this sets the tone and encourages users to make the switch to Teams. In the welcome message, include the same links you sent in email so users know where to get Teams as well as any other helpful information to get users up and running quickly. Touch base with users to ensure they know how to download, install, and sign in to Teams so they can start chatting, sharing files, and collaborating with each other.

Get Teams clients

Teams has clients for desktop (Windows and Mac), web, and mobile (iOS and Android). We recommend users install the desktop and mobile clients to have the best experience with Teams.

Jump to: Teams for Windows | Teams for Mac | Teams for web browsers | Teams for iOS | Teams for Android

Desktop client

The Teams desktop client gives Windows and Mac users the best overall experience. To learn more, see Get clients for Teams (Desktop client) and Hardware requirements for the Microsoft Teams app.

> **NOTE**
> As an admin, you can choose the method to distribute the installation files to computers in your organization, such as Microsoft Endpoint Configuration Manager (Windows) or Jamf Pro (macOS).

Teams for Windows

The easiest way to install the Windows desktop client is to:

1. Download the Windows desktop client from https://teams.microsoft.com/downloads.
2. Run the installer (doesn't require admin permissions).

3. Start Teams after installation completes.

> **NOTE**
> Later, when you're considering a more formal, mass rollout of Teams across your organization, check out the Teams Windows desktop client video to learn how to plan for and deploy it.

Teams for Mac

The easiest way to install the Mac desktop client is to:

1. Download the Mac desktop client from https://teams.microsoft.com/downloads.
2. Run the installer (requires admin permissions).
3. Start Teams after installation completes.

Web client

Teams provides a feature-rich web client, https://teams.microsoft.com, that supports a variety of browsers.

Teams fully supports the following Internet browsers, with noted exceptions for calling and meetings. This table applies to operating systems running on desktop computers.

BROWSER	CALLING - AUDIO, VIDEO, AND SHARING	MEETINGS - AUDIO, VIDEO, AND SHARING[1] [2] [3]
Internet Explorer 11	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on IE11 without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing) Microsoft 365 apps and services will not support Internet Explorer 11 starting August 17, 2021 (Microsoft Teams will not support Internet Explorer 11 earlier, starting November 30, 2020). Learn more. Please note that Internet Explorer 11 will remain a supported browser. Internet Explorer 11 is a component of the Windows operating system and follows the Lifecycle Policy for the product on which it is installed.
Microsoft Edge, RS2 or later	Fully supported, except no outgoing sharing[4]	Fully supported, except no outgoing sharing
Microsoft Edge (Chromium-based), the latest version plus two previous versions	Fully supported	Fully supported
Google Chrome, the latest version plus two previous versions	Fully supported	Fully supported Sharing is supported without any plug-ins or extensions on Chrome version 72 or later.

BROWSER	CALLING - AUDIO, VIDEO, AND SHARING	MEETINGS - AUDIO, VIDEO, AND SHARING
Safari 13.1+	1:1 calls not supported. Group calls supported with full audio support. Video: Incoming only Sharing: Incoming sharing only (no outgoing)	Meetings are supported with full audio support. Video: Incoming only Sharing: Incoming sharing only (no outgoing). Note that only a user's entire display can be shared; sharing specific windows within a display is not available.
Firefox, the latest version plus two previous versions	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on Firefox without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing)
Safari versions before 13	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on Safari without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing) Safari is enabled on versions higher than 11.1 in preview. While in preview, there are known issues with Safari's Intelligent Tracking Prevention.

[1] To give and take control of shared content during sharing, both parties must be using the Teams desktop client. Control isn't supported when either party is running Teams in a browser. This is due to a technical limitation that we're planning to fix.

[2] Blur my background isn't available when you run Teams in a browser. This feature is only available in the Teams desktop client.

[3] Teams meetings on browsers are limited to a single incoming video feed of active speaker.

[4] Edge RS2 or later doesn't support sending real-time audio and video traffic through HTTP proxies.

> **NOTE**
>
> As long as an operating system can run the supported browser, Teams is supported on desktop computers. For example, running Firefox on the Linux operating system is an option for using Teams.
>
> For mobile operating systems, we recommend that you run the Teams app, available from the Android and iOS stores. Running Teams in a mobile operating system is supported, but many features are unavailable.

Mobile client

The Teams mobile clients for iOS and Android keep users connected and productive when on-the-go. To learn more, see Get clients for Teams (Mobile clients).

Teams for iOS

Users running iOS 10.0 or later can download the Teams mobile app from the Apple App Store and get started right away.

Teams for Android

Users running Android 4.4 or later can download the Teams mobile app from the Google Play Store and get started right away.

Drive initial adoption

It's important to encourage your early adopters to actively use Teams to promote new collaboration experiences and develop Teams champions. We recommend using the "How do I" channel in the "Get to know Teams" team you created to share guidance with your users to help drive adoption.

For detailed guidance on driving Teams adoption for your organization, see Adopt Teams.

Next steps

Go to Monitor usage and feedback.

Monitor usage and feedback in Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

It's important to know how users are using Teams and what their experience is with Teams. Usage reports can help you better understand usage patterns, and along with user feedback, give you insights to inform your wider rollout and where to prioritize training and communication efforts.

Monitor usage

For your first set of teams, we recommend you review reports twice a week to understand emerging trends.

For example, usage reports show that not many users are using the Teams mobile clients. This may indicate that users aren't sure how to install the clients. Posting step-by-step installation instructions in a channel may help drive usage of a wider range of clients. Or, usage reports show that users are primarily using Teams for private chats. In this example, you may want to review your team scenarios because users are chatting outside the initial teams and channels that were set up.

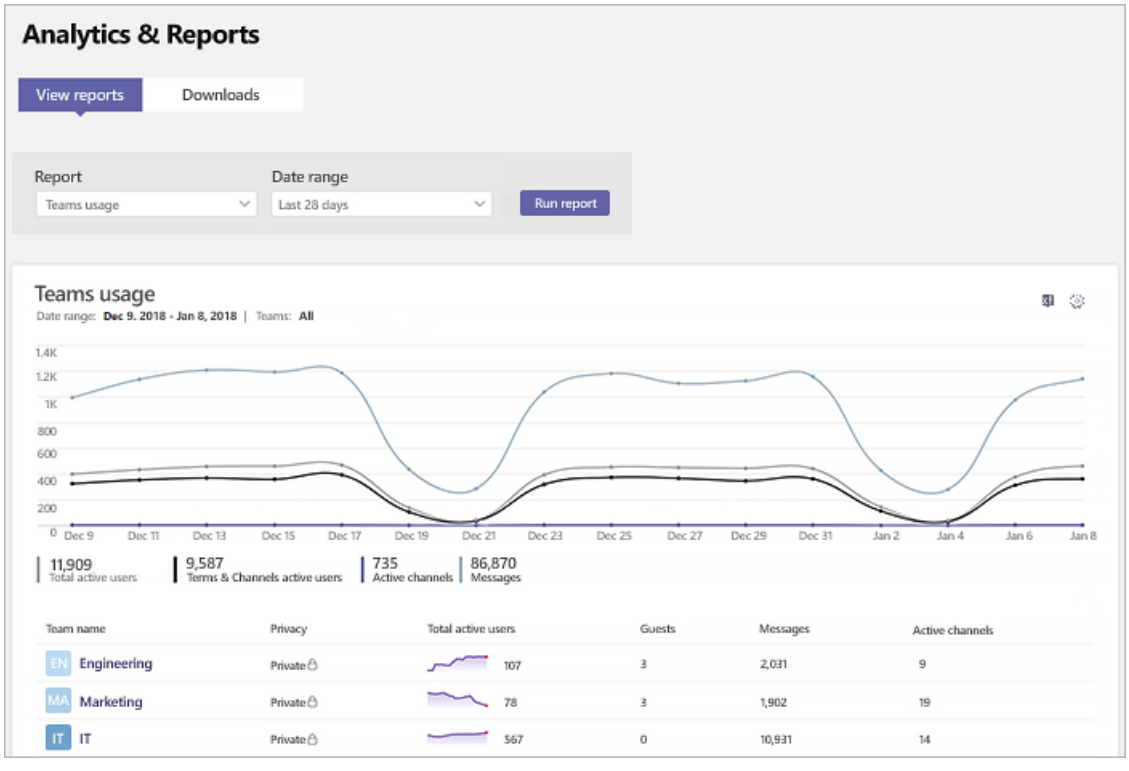
Here's how to get reports to view Teams usage.

Teams analytics & reports (Microsoft Teams admin center)

Teams reports in the Microsoft Teams admin center give you insights into how Teams is used in your organization. Use the reports to get a view into Teams usage, user activity, and device usage across your organization.

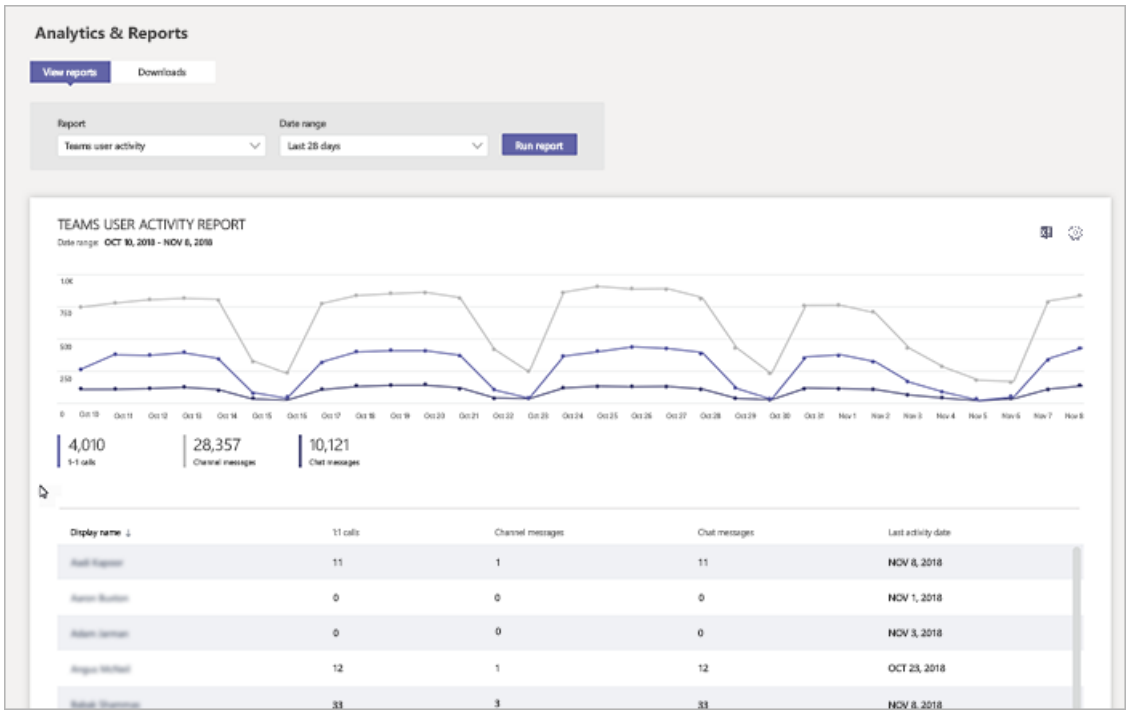
To view these reports, you must be a global admin in Microsoft 365 or Office 365, Teams service admin, or Skype for Business admin. Go to the Microsoft Teams admin center, in the left navigation, select **Analytics & reports**, and then under **Report**, choose the report you want to run.

- **Teams usage report**: This report gives you an overview of usage activity in Teams, including the total active users and channels, and the number of active users and channels, guests, and messages in each team.

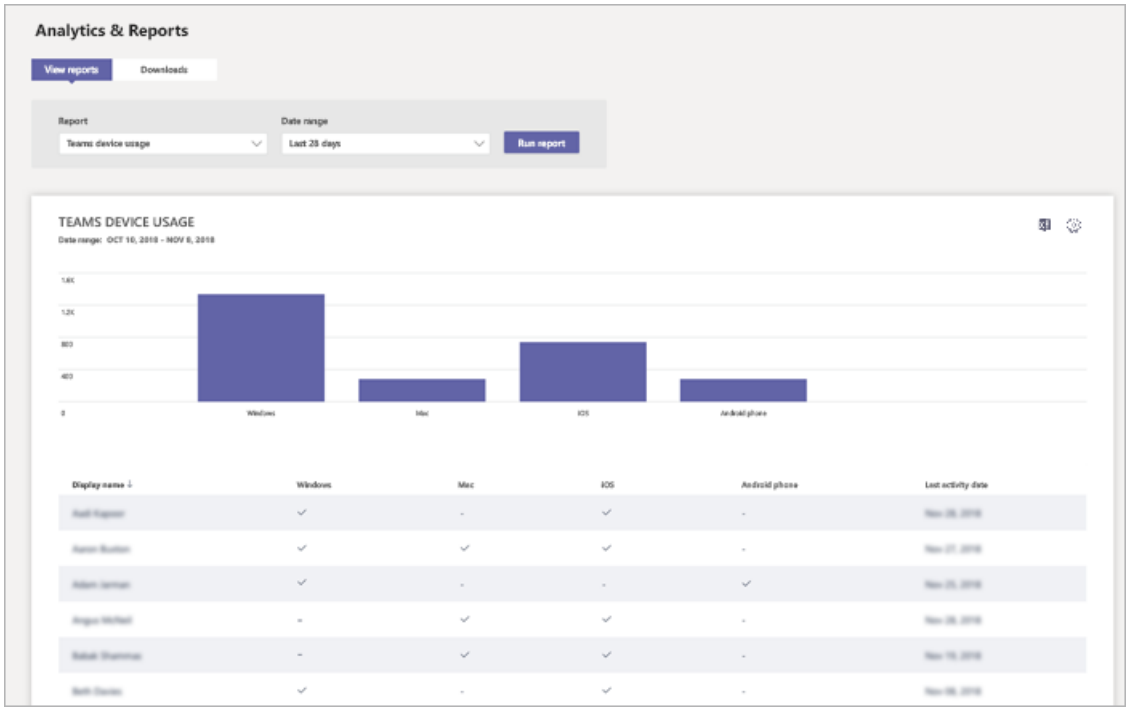


- **Teams user activity report**: This report gives you insight into the types of activities users engage in, such

as how many people communicate through 1:1 calls, channel messages, and private chat messages.



- **Teams device usage report**: This report shows you how users connect to Teams, including how many people use Teams on their mobile devices when on-the-go.



To learn more, check out Teams analytics and reporting.

Teams activity reports (Microsoft 365 admin center)

You can also view Teams activity through reports that are available from the Microsoft 365 admin center. These reports are part of the Microsoft 365 reports in the Microsoft 365 admin center and provide information about user activity and device usage.

To view these reports, go to the Microsoft 365 admin center, click **Reports** > **Usage**. Under **Select a report**, click **Microsoft Teams**. From here, choose the report you want to view.

To learn more, go to Use activity reports for Teams.

Microsoft 365 usage analytics

You can use Microsoft 365 usage analytics in Power BI to view and analyze usage data for Teams and other Microsoft 365 or Office 365 products and services. Microsoft 365 usage analytics is a content pack that includes a pre-built dashboard and a number of pre-built reports. Each report gives you specific usage data and insights. To connect to the content pack, you need Power BI and must be a global admin in Microsoft 365, Office 365, or reports reader. If you don't already have Power BI, sign up for the free Power BI service.

To learn more, see Microsoft 365 usage analytics.

Gather feedback

The adoption of a new collaboration experience is about changing the behavior of users. Enabling change requires training, encouragement, and positive examples. It's important for users to have a voice during the transition to Teams and to be able to openly share their experiences. We recommend using the Feedback channel in the "Get to know Teams" team you created to collect and address feedback from users on their experiences with Teams.

Next steps

Go to Get resources to plan your organization-wide rollout of Teams.

Choose a path to your organization-wide rollout of Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

Now that you've successfully set up your first teams and onboarded an initial group of users while driving usage, it's time to look at your go-forward plan to deploy Teams across the rest of your organization while driving adoption. Start with the first workload, Chat, teams, channels, & apps.

For help picking your path to rolling out Teams, read How to roll out Teams.

Chat, teams, channels, & apps in Microsoft Teams

12/5/2020 • 11 minutes to read • Edit Online

Teams provides a great out-of-the-box collaboration experience for your organization, and most organizations find that the default settings work for them. This article helps you decide whether to change any of the default settings, based on your organization's profile and business requirements, then it walks you through each change. We've split the settings into two groups, starting with the core set of changes you're more likely to make. The second group includes the additional settings you may want to configure, based on your organization's needs.

To get started, watch our short Teams chat, teams, and channels video (4:30 minutes):

New in November 2019

- You can now use Advisor for Teams (preview) to help you roll out Microsoft Teams. Advisor for Teams (preview) walks you through your Teams rollout. It assesses your Microsoft 365 or Office 365 environment and identifies the most common configurations that you may need to update or modify before you can successfully roll out Teams.
- Microsoft Teams Essentials for IT YouTube channel, including short (8-10 minute) videos that show you how to roll out, configure, and manage Teams.

TIP

We recommend that you include our featured apps -- such as Planner -- in your initial Teams rollout. Add other apps, bots, and connectors as you drive Teams adoption.

NOTE

For details about Teams features on different platforms, see Teams features by platform.

Chat deployment prerequisites

Before you roll out Teams across your organization, take time to confirm that your environment is ready for Teams. Review Prepare your organization's network for Teams and make any required changes to your environment.

ASK YOURSELF	ACTION
Is my organization ready to roll out Teams?	To answer this question, see: • Prepare your organization's network for Teams • URLs and IP address ranges • Plan for Microsoft 365 Groups when creating teams

Core deployment decisions

These are the chat, teams, and channels settings that most organizations want to change (if the default settings don't work for them).

Teams administrators

Teams provides a set of custom administrator roles that can be used to manage Teams for your organization. The roles provide various capabilities to administrators.

ASK YOURSELF	ACTION
Who will be assigned the Teams Communications Administrator role?	To learn more about Teams administrator roles see Use Microsoft Teams admin roles to manage Teams.
Who will be assigned the Teams Communications Support Engineer role?	To assign admin roles, see Assign administrator and non-administrator roles to users with Active Directory.
Who will be assigned the Teams Communications Support Specialist role?	

Teams owners and members

In addition to administrator roles, Teams lets you assign owner and member user roles, and selectively give them moderator capabilities (if moderation has been set up) to control who can perform certain actions within a channel. Moderation allows you to control who can start new posts in a channel, add and remove team members as moderators, and control whether team members can reply to existing channel messages.

ASK YOURSELF	ACTION
Who should be assigned to each role?	To compare the capabilities of each role, see Assign team owners, moderators, and members in Microsoft Teams.
How do I assign a user role?	To assign or change a role, see Assign a user role.
Do I need to control who can post and reply in a channel?	To configure moderation, see Set up and manage channel moderation in Microsoft Teams.

Messaging policies

Messaging policies control which chat and channel messaging features are available to users in Teams. For example, who can edit and delete sent messages, who can use chat, who can use memes in conversations, and more. By default, users are assigned the global messaging policy and all features are **On**. You can use the default global policy or create one or more custom messaging policies for people in your organization.

ASK YOURSELF	ACTION
Will I customize the global messaging policy?	For information about using the Microsoft Teams admin center to change the global messaging policy or add a new policy, see Manage messaging policies in Teams.
Do I require multiple messaging policies?	To create and assign a messaging policy in PowerShell, see PowerShell script sample - Create and assign a messaging policy.
How will I determine which groups of users get which messaging policy?	To learn about the CsTeamsMessagingPolicy cmdlets, see Set-CsTeamsMessagingPolicy.

External access

External access (formerly known as federation) lets your Teams and Skype for Business users communicate with

users who are outside of your organization. By turning this on and adding domains to the allowed list, your users can communicate with users in other domains and organizations. External access differs from guest access in that an entire domain is given access permission, not an individual. External access is turned off by default.

ASK YOURSELF	ACTION
• Will I turn on external access for my organization? • If enabled, will I limit which domains my organization can communicate with?	To turn on external access, see Plan for external access.

Guest access

Guest access in Teams lets individuals outside your organization access teams and channels. You can use the guest access settings to control which features guest users can or can't use. Guest access is turned off by default. To learn more, see Guest access in Teams.

> **NOTE**
>
> For more on External access and Guest access see here - Communicate with users from other organizations in Microsoft Teams

ASK YOURSELF	ACTION
Will I turn on guest access for my organization?	To turn on guest access, see Turn on or off guest access in Teams.
If enabled, will I customize the features available to guests in my organization?	To customize guest access feature availability, see Authorize guest access in Teams.

Teams settings

Teams settings let you set up your teams for features such as email integration, cloud storage options, organization tab, meeting room device setup, and search scope. When you make changes to these settings, they apply to all the teams in your organization. To learn more, see Teams settings.

ASK YOURSELF	ACTION
Will I customize Teams settings for my organization?	To learn about Teams settings and how to customize them, see Teams settings.

Teams clients

Teams supports a number of clients from web to desktop to mobile, and the default configuration lets users choose whichever clients they want. To learn more, see Get clients for Teams.

ASK YOURSELF	ACTION
Will I customize Teams client availability for my organization?	Check out Hardware requirements for the Teams app.
Will I customize Teams client settings for my organization?	Learn how to Install Teams using MSI.

Teams usage reporting

The Global Admin, Teams Service Admin, and Reports Readers roles can view Teams usage reports. To learn more, see the Microsoft 365 usage analytics.

ASK YOURSELF	ACTION
Who needs to see the Teams usage reports, and do they have the correct role to view them?	• If the user isn't an admin, assign the Reports reader role. • See Roles and permissions and View and assign roles to learn how to assign admin roles in Azure Active Directory.

Teams default apps

Teams provides a number of first-party (Microsoft provided) and third-party apps to engage users, support productivity, and integrate commonly used business services into Teams. Get apps from the Teams Store. Apps are turned on by default in Teams.

To learn more about rolling out and managing apps in Teams, see our in-depth Apps, bots, & connectors guidance.

Additional deployment decisions

You may want to change these settings, based on your organization's needs and configuration.

Teams licensing

Teams is provided as part of many Microsoft 365 or Office 365 licenses. To learn more about Teams licensing, see Microsoft Teams service description.

ASK YOURSELF	ACTION
Do my users have the licenses they need in order to use all the Teams features I want to roll out?	To learn about licensing requirements, read Microsoft Teams service description.

Exchange and SharePoint interoperability

For the full Teams experience, every user should be enabled for Exchange Online, SharePoint Online, and Microsoft 365 group creation. The following articles outline information related to Exchange mailboxes hosted in various environments, how Exchange and Teams interact, and similar considerations for SharePoint and OneDrive for Business.

ASK YOURSELF	ACTION
Will I be able to deploy the Teams features that I require with the current Exchange and SharePoint deployments?	For more information about Exchange and SharePoint in Teams, see: • How Exchange and Teams interact • How SharePoint Online and OneDrive for Business interact with Teams

Teams limits and specifications

When planning an enterprise deployment of Teams, you should take into account any relevant limitations and

specifications, such as the maximum number of members in a team, the maximum number of teams a user can create, and so on.

ASK YOURSELF	ACTION
What limits am I likely to hit with my Teams rollout?	To learn more, read Limits and specifications for Teams.

URLs and ports

Organizations that maintain fine-grained control of their internet traffic should read URLs and IP address ranges for an up-to-date list of the URLs, IP addresses, ports, and protocols that must be correctly configured for Teams. Microsoft is continuously improving the Microsoft 365 and Office 365 services and adding new functionality, which means the required ports, URLs, and IP addresses may change over time. We recommend that you subscribe via RSS to receive notifications when this information is updated or changed. At a minimum, make sure you've opened the ports listed above in Chat deployment prerequisites.

ASK YOURSELF	ACTION
Do I require internet access rules to enable users to use Teams, or is it sufficient to open the minimum required ports?	To learn more, see URLs and IP address ranges.

Governance (naming conventions, who can create teams)

Your organization might require that you implement controls on how teams are named and classified, who can create teams, and team expiration, retention, and archiving. This is called governance. You can use Azure Active Directory (Azure AD) to configure each of these areas.

ASK YOURSELF	ACTION
Will I need to implement controls on who can create teams?	Read Plan for governance in Teams.
Will I need to implement controls on how teams are named?	Read Enforce a naming policy for Microsoft 365 groups in Azure AD.

Teams application policy (side-rail control)

A pinned app shows up in the side rail in Teams. By creating Teams application policies, you can preconfigure sets of pinned Teams apps to personalize Teams for select groups of users. By default, the **Allow external apps in Microsoft Teams** setting is turned on.

ASK YOURSELF	ACTION
Should I create preconfigured sets of pinned Teams applications?	Read Admin settings for apps in Teams.
How will I decide which groups receive these app groupings?	Read Teams apps permissions and considerations.

Archiving and compliance

Your organization might require that you implement controls on how teams are archived and the types of data that are held in certain types of teams. Read Overview of security and compliance in Teams to learn which Teams settings are turned on by default.

ASK YOURSELF	ACTION
Will I need to configure team retention?	To set up retention policies, see Set up Teams retention policies.
Will I need to configure team archiving?	To archive or restore a team, see Archive or restore a team.
Will I need to configure additional compliance settings?	For more information about security and compliance, see Overview of security and compliance in Teams.

Conditional access

Teams relies heavily on Exchange Online, SharePoint Online, and Skype for Business Online for core productivity scenarios, including meetings, calendars, interop chats, and file sharing. Conditional access policies that are set for these cloud apps apply to Teams when a user signs in directly to Teams, on any client. Conditional access policies that are set for the Teams cloud app control aspects such as whether users can access Teams services from certain networks.

ASK YOURSELF	ACTION
Will I need to configure conditional access for Teams?	• To understand how access policies work, see How do conditional access policies work for Teams? • To set up multi-factor authentication (MFA) for Teams, see: ◦ Quickstart: Require MFA for specific apps with Azure Active Directory conditional access ◦ Azure Active Directory conditional access settings reference

Education (EDU)

IT pros working in education can take advantage of Teams for Education, which comes with a number of capabilities that have been tailored to meet education-specific scenarios for students, faculty, and the wider business.

ASK YOURSELF	ACTION
Will I use EDU-specific Teams templates?	To learn more about Teams for Education, see Microsoft Education governance FAQ for admins.
Will I deploy scoped search?	To set up Teams for EDU, see Quickstart - Teams for Education admins.
Will I integrate Teams with the School Data Sync service to provision user accounts?	Teams resources for Education admins

Government - GCC considerations

The use of Office 365 for Government - GCC (Government Community Cloud) is appropriate to meet the requirements of IT pros who are driving deployments of Office 365 in US federal, state, local, tribal, or territorial government entities or other entities that handle data that's subject to government regulations and requirements.

ASK YOURSELF	ACTION
Will I need to deploy Teams in a Office 365 for Government – GCC environment?	For deployment considerations, see Plan for Office 365 Government - GCC deployments.

Next steps

- Drive adoption of chat, teams, channels, & apps.
- Include featured apps - such as Planner - in your initial Teams rollout. Add other apps, bots, & connectors as you drive Teams adoption.
- Roll out meetings & conferencing
- Roll out cloud voice

Use Advisor for Teams to help you roll out Microsoft Teams

12/5/2020 • 10 minutes to read • Edit Online

Advisor for Teams walks you through your Microsoft Teams rollout. It assesses your Microsoft 365 organization environment and identifies the most common configurations that you may need to update or modify before you can successfully roll out Teams. Then, Advisor for Teams creates a Deployment team (in Teams), with channels for each workload you want to roll out. Each workload in the Deployment team comes with a comprehensive Planner plan that includes all the rollout tasks for each workload. Using this Planner plan, you'll assign tasks to the people responsible for each phase of the rollout - including the project manager, Teams service admins, support people, and your adoption and user readiness team. Each rollout task contains all the guidance and resources you need to successfully complete the task.

Advisor for Teams is part of the Teams admin center. At a minimum, you'll need a Microsoft 365 Business Basic license so you can take advantage of the Advisor for Teams integration with Forms and Planner. To begin using Advisor for Teams, click the **Start** button in the **Deploying Teams workload** widget on the Dashboard. Or go to **Planning** > **Teams Advisor**.

> **IMPORTANT**
> Advisor for Teams isn't available for Microsoft 365 Government (GCC High or DoD) deployments.

For a guided overview of the Advisor for Teams experience, check out the Deploy & Configure Microsoft Teams Microsoft Mechanics video.

Using Advisor for Teams

Teams, Forms, and Planner licenses are required to use Advisor for Teams. However, you don't have to be a Teams admin to use Advisor for Teams - anybody in your organization can use it. We've set up special permissions so non-admin users can get to Advisor for Teams, even though it's in the Teams admin center. You DO have to be a Teams admin, Teams Service Administrator, or Global Administrator to open the tenant readiness assessments (this is because the special non-admin roles don't have access to the Microsoft Graph APIs underlying the assessments).

> **IMPORTANT**
> If **Teams Advisor** is missing under **Planning** in the Teams admin center, it means the user isn't licensed for Teams.

The first time you use Advisor for Teams, it'll create a Deployment team for you in Teams. It adds a channel for each workload you select.

> **IMPORTANT**
> If a Deployment team has already been created and a different user tries to create it, they'll get an error telling them to contact their support team. This prevents Teams from unintentionally disclosing information about the existing team and its members. Ask the owner of the Deployment team to add you, or contact your support person for help.

Available Advisor for Teams plans

Advisor for Teams currently provides the following plans:

1. Chat, teams, channels, and apps
   - Tenant assessment
   - Planner plan, including adoption tasks
   - Forms user survey
   - Advisor for Teams bot
2. Meetings and conferencing
   - Tenant assessment
   - Planner plan, including adoption tasks
   - Forms user survey
   - Advisor for Teams bot
3. Skype for Business upgrade
   - Tenant assessment
   - Planner plan, including adoption tasks
   - Forms user survey
   - Advisor for Teams bot
   - Designed for customers who are currently using Skype for Business Online or Skype for Business on-premises environments, the Skype for Business upgrade plan will help you take the guesswork out of your upgrade journey. Leveraging a proven success framework for implementing change, the plan will guide you through the step-by-step process whether you're just getting started with Teams, already using Teams alongside Skype for Business, or ready to upgrade. The plan will also connect you to online guidance and best practices, downloadable assets, live 1:many planning workshops, and additional resources to support your success.

We recommend that you start with the Chat, teams, channels, and apps plan. When you're done deploying that workload, go back to Advisor for Teams and click **Add channel** to start the next workload.

Tenant assessment

Each plan includes a tenant readiness assessment that you can use to quickly identify aspects of your environment that may need remediation before you roll out Teams. The assessments include prerequisites and best practices. Each assessment test will have a green check mark or an orange warning triangle.

- ✓ A green check mark means your tenant passed the specific test.
- ⚠ An orange warning triangle means that we suggest you follow up to determine if any action is needed (for example, a Microsoft 365 Group expiration policy is recommended but not required).

> **IMPORTANT**
> Once a user with an Administrative role starts Advisor for Teams, all assessments run in the background. If you update or remediate something, it may not be reflected in your assessments for up to 24 hours.

The sections below describe each assessment, including whether something is a prerequisite or best practices, what each assessment checks is doing and why, and guidance for remediation as needed.

Assessment tests for all workloads

ASSESSMENT TEST	WHAT IT TELLS YOU

ASSESSMENT TEST	WHAT IT TELLS YOU
Vanity domain configured	Whether there's a non-@onmicrosoft.com domain configured for your tenant (for example, @contoso.onmicrosoft.com). You can use the @onmicrosoft.com domain, of course, or you can configure a vanity domain - your choice. For more information, read Add a domain to Microsoft 365.
Teams licenses	This is a prerequisite - you **must have** Teams licenses in order to roll out Teams. Queries the Microsoft Graph to see whether you have Teams licenses (with at least one license available to assign). For more information, read Microsoft Teams service description.
Exchange Online licenses	Whether you have an active subscription with available Exchange Online licenses. While Exchange isn't required for basic Teams functionality, integration with Exchange provides an optimal Teams experience. Queries the Microsoft Graph to analyze the subscriptions associated with your tenant and validate whether you have subscriptions with an eligible Exchange Online license (with at least one license available to assign). For more information, read How Exchange and Teams interact.
SharePoint Online licenses	Whether you have an active subscription with available SharePoint Online licenses. We recommend per-user SharePoint Online licenses to provide OneDrive for Business for file storage in chats. Queries the Microsoft Graph to see whether you have SharePoint Online licenses (with at least one license available to assign). For more information, read How SharePoint Online and OneDrive for Business interact with Teams.
Guest access enabled	Whether guest access is turned on. Guest access lets you invite external users to your join your teams. See Collaborate with guests in a team to walk through turning on guest access in Teams; the checklist includes the required Azure AD configurations.
External access configured	Whether external access is turned on. By default, it's turned on, with open federation.

Assessments for chat, teams, channels, and apps

In addition to the Assessment tests for all workloads, the following additional assessments are run for the chat, teams, channels, and apps workload:

ASSESSMENT TEST	WHAT IT TELLS YOU
Microsoft 365 Group naming policy configured	Whether naming standards have been configured for Microsoft 365 Groups. Microsoft 365 Groups naming policy enables your organization to apply a consistent naming strategy to user-created teams and also applies to other Groups workloads (including Outlook, SharePoint, Planner, and Yammer). This test queries Azure AD via the Microsoft Graph to check for the existence of naming policies that apply to Microsoft 365 Groups. For more information, read Groups naming policy.

ASSESSMENT TEST	WHAT IT TELLS YOU
Microsoft 365 Group Expiration Policy configured	Whether a Group Expiration Policy has been defined for Microsoft 365 Groups. This enables your organization to automatically remove inactive Teams. It's turned off by default. This test queries Azure AD via the Microsoft Graph and reports whether the value has been modified from the default. For more information, read Microsoft 365 group expiration policy.

Assessments for meetings and conferencing

In addition to the Assessment tests for all workloads, the following additional assessments are run for the meetings and conferencing workload:

ASSESSMENT TEST	WHAT IT TELLS YOU
Audio Conferencing licenses	Whether you have an active subscription with Audio conferencing licenses. This is a prerequisite if you're deploying Audio conferencing bridges. Queries the Microsoft Graph to see whether you have Audio Conferencing licenses (with at least one license available to assign) For more information, read Teams add-on licensing.
Stream licenses	Whether you have an active subscription with Microsoft Stream licenses. This is a prerequisite if you want to turn on Meeting Recording. Queries the Microsoft Graph to see whether you have Microsoft Stream licenses (with at least one license available to assign). For more information on Stream and how to turn it on, read Teams cloud meeting recording.

Assessments for Skype for Business Upgrade

In addition to the Assessment tests for all workloads, Skype for Business Upgrade also includes assessments used in the meetings and conferencing plan.

Advisor for Teams bot

Once Advisor for Teams creates your Deployment team, the Advisor bot delivers the following message in the General channel:

> **Welcome to your Deployment team for Microsoft Teams!**
>
> The purpose of this team is to walk you through your organization's Teams rollout by giving you all the resources you need and providing a collaboration space for the project team. Each channel created using Advisor for Teams includes a step-by-step Planner plan and other resources such as a Forms users survey that can be used throughout your rollout. At any point, you can you go back and review the tenant readiness assessment or add additional workload plans using the Teams admin center.
>
> **Call to action**
>
> - If you're new to Teams or Planner, check out our Teams walkthrough and watch the Planner quick-start videos.
> - Head over to your Deployment team in Teams. Select your workload channel (for example, Chat, teams, channels, and apps), and select the **Planner** tab to get started.
>
> To learn more about Advisor for Teams, read Use Advisor for Teams to roll out Microsoft Teams.

IMPORTANT

The Advisor for Teams Bot is only used to send a welcome message to your Deployment team. No additional data is collected.

IMPORTANT

The Advisor for Teams bot is turned on by default. Don't turn it off if you use or plan on using Advisor for Teams.

Frequently asked questions

What are the licensing requirements for Advisor for Teams?

At a minimum, you'll need Microsoft 365 Business Basic so you can take advantage of the Advisor for Teams integration with Forms and Planner.

Can I delete the Deployment team?

After Advisor for Teams has created your Deployment team, manage the team like any other team - including the ability to delete it. Be aware that, if you don't delete the team by using the Teams admin center, the Teams admin center will show that the team still exists.

Can I add or remove channels in the Deployment team?

Yes, once the Deployment team has been created, you'll manage the channels the same way as any other team.

Can I add or remove project team members in the Deployment team?

Yes, once the Deployment team has been created, you'll manage it the same way as any other team.

Can I modify the Planner plans?

Yes, after Advisor for Teams has created your Deployment team, you should update the Planner plan so it best supports your Teams rollout. You can modify anything - buckets, tasks, task details - just like any other Planner plan.

Can I modify the Forms survey?

Yes, after Advisor for Teams has created your Deployment team, you can modify the Forms survey as needed.

Are there any differences between Advisor for Teams in GCC?

Yes, user survey Forms are created but are not pinned in plan channels as the Teams Forms app is not available in GCC presently.

What information is Advisor for Teams collecting about my organization?

Advisor for Teams requests your agreement to collecting non-EUII (end user identifying information). The information that is collected is in the form of telemetry that provides feedback to Microsoft on how well Advisor for Teams is driving successful outcomes and where it may need to be improved. This same data is used to identify opportunities for Microsoft to proactively engage with your organization in an effort to assist with your deployment.

Can I use Advisor for Teams with FastTrack?

Yes, FastTrack leverages Advisor for Teams for all customers looking to deploy Teams. They can assist with the initial setup of your Deployment team using Advisor for Teams (if required) and also provide as-needed support on specific topics during your Teams rollout.

Can I use Advisor for Teams with a partner?

Yes, you can use Advisor for Teams while also using a deployment partner for your Teams deployment. If your partner is a CSP and manages your tenant on your behalf, they can use Advisor for Teams to create your Deployment team and assist you with executing the overall project. Additionally, you can work with any partner by

adding those individuals as guests in your Deployment team, to allow them to participate as a member of the overall project team.

How do I use Planner?

Check out Microsoft Planner help and the Planner quick-start videos.

How do I use Forms?

Go to the Forms help center.

Related topics

How to roll out Teams

Best practices for organizing teams in Teams

Product names and service plan identifiers for licensing

Overview of teams and channels in Microsoft Teams

11/2/2020 • 6 minutes to read • Edit Online

> **NOTE**
> Review the following information to understand chat, teams, channels, & apps in Teams. Then, go to Chat, teams, channels, & apps in Teams to walk through a list of decisions important to your Teams rollout.

Let's get started by thinking about how Microsoft Teams allows individual teams to self-organize and collaborate across business scenarios:

- **Teams** are a collection of people, content, and tools surrounding different projects and outcomes within an organization.
  - Teams can be created to be private to only invited users.
  - Teams can also be created to be public and open and anyone within the organization can join (up to 10,000 members).

  A team is designed to bring together a group of people who work closely to get things done. Teams can be dynamic for project-based work (for example, launching a product, creating a digital war room), as well as ongoing, to reflect the internal structure of your organization (for example, departments and office locations). Conversations, files and notes across team channels are only visible to members of the team.
- **Channels** are dedicated sections within a team to keep conversations organized by specific topics, projects, disciplines—-whatever works for your team! Files that you share in a channel (on the Files tab) are stored in SharePoint. To learn more, read How SharePoint Online and OneDrive for Business interact with Teams.
  - Channels are places where conversations happen and where the work actually gets done. Channels can be open to all team members or, if you need a more select audience, they can be private. Standard channels are for conversations that everyone in a team can participate in and private channels limit communication to a subset of people in a team.
  - Channels are most valuable when extended with apps that include tabs, connectors, and bots that increase their value to the members of the team. To learn more, see Apps, bots, & connectors in Teams.

For help using teams and channels, check out Teams and channels.

View this short video to learn more about best practices for creating teams and channels.

Membership, roles, and settings

Team membership

When Microsoft Teams is activated for your entire organization, designated team owners can invite any employee they work with to join their team. Microsoft Teams makes it easy for team owners to add people in the organization based on their name. Depending on your organization's settings guests who are team members but outside of your organization can also be added to your teams. See Guest Access in Microsoft Teams for more information.

Team owners can also create a team based on an existing Microsoft 365 group. Any changes made to the group will be synced with Microsoft Teams automatically. Creating a team based on an existing Microsoft 365 group not only simplifies the process of inviting and managing members, but also syncs group files inside of Microsoft

Teams.

Team roles

There are two main roles in Microsoft Teams:

- **Team owner** - The person who creates the team. Team owners can make any member of their team a co-owner when they invite them to the team or at any point after they've joined the team. Having multiple team owners lets you share the responsibilities of managing settings and membership, including invitations.
- **Team members** - The people who the owners invite to join their team.

In addition, if moderation is set up, team owners and members can have moderator capabilities for a channel. Moderators can start new posts in the channel and control whether team members can reply to existing channel messages. Team owners can assign moderators within a channel. (Team owners have moderator capabilities by default.) Moderators within a channel can add or remove other moderators within that channel. For more information, see Set up and manage channel moderation in Microsoft Teams.

Team settings

Team owners can manage team-wide settings directly in Microsoft Teams. Settings include the ability to add a team picture, set permissions across team members for creating standard and private channels, adding tabs and connectors, @mentioning the entire team or channel, and the usage of GIFs, stickers, and memes.

Take three minutes to check out this go-to-guide video for team owners:

If you are a Microsoft Teams administrator in Microsoft 365 or Office 365, you have access to system-wide settings in the Microsoft Teams admin center. These settings can impact the options and defaults team owners see under team settings. For example, you can enable a default channel, "General", for team-wide announcements, discussions, and resources, which will appear across all teams.

By default, all users have permissions to create a team within Microsoft Teams (to modify this, see Assign roles and permissions in Teams. Users of an existing Microsoft 365 group can also enhance their permissions with Teams functionality.

One key early planning activity to engage users with Microsoft Teams is to help people think and understand how Teams can enhance collaboration in their day to day lives. Talk with people and help them select business scenarios where they are currently collaborating in fragmented ways. Bring them together in a channel with the relevant tabs that will help them get their work done. One of the most powerful use cases of Teams is any cross-organizational process.

Example Teams

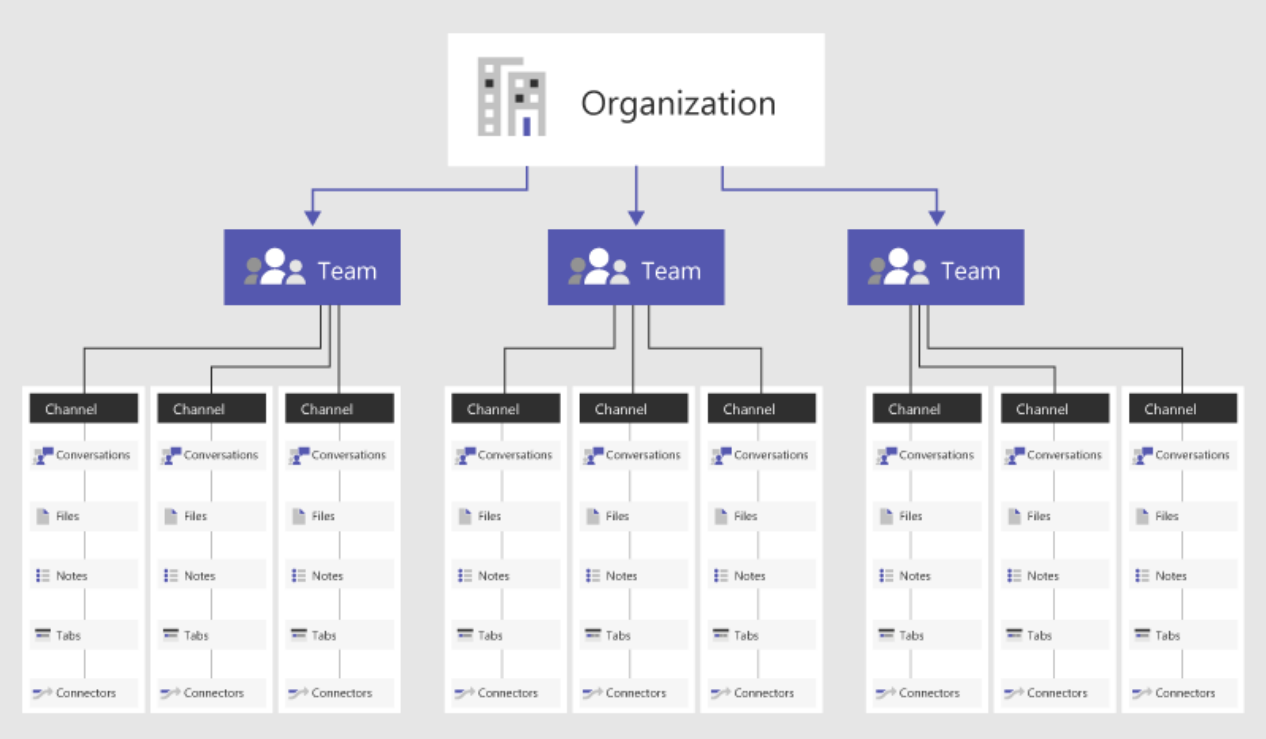
Below are a few functional examples of how different types of users may approach setting up their teams, channels, and apps (tabs/connectors/bots). This may be useful to help kick off a conversation about Microsoft Teams with your user community. As you think about how to implement Microsoft Teams in your organization, remember that you can provide guidance on how to structure their teams; however, users have control of how they can self-organize. These are just examples to help get teams to start thinking through the possibilities.

Microsoft Teams is great for breaking down organizational silos and promoting cross-functional teams, so encourage your users to think about functional teams rather than organizational boundaries.

TYPES OF TEAMS	POTENTIAL CHANNELS	APPS (TABS /CONNECTORS /BOTS)

TYPES OF TEAMS	POTENTIAL CHANNELS	APPS (TABS /CONNECTORS /BOTS)
Sales	Annual Sales Meeting Quarterly Business Review Monthly Sales Pipeline Review Sales Playbook	Power BI Trello CRM Summarize Bot
Public Relations	Press Releases News and Updates Fact Checking	RSS Feed Twitter
Event Planning	Marketing Logistics and Scheduling Venue Budget	Twitter Facebook Planner PDF
Marketing/Go to Market	Market Research Messaging Pillars Communications Plan Marketing Bill of Materials	YouTube Microsoft Stream Twitter MailChimp
Technical Operations	Incident Management Sprint Planning Work Items Infrastructure and Operations	Team Services Jira AzureBot
Product Team	Strategy Marketing Sales Operations Insights Services & Support	Power BI Team Services
Finance	Current Fiscal FY Planning Forecasting Accounts Receivable Accounts Payable	Power BI Google Analytics
Logistics	Warehouse Operations Vehicle Maintenance Driver Rosters	Weather Service Travel / Road Disruptions Planner Tubot UPS Bot
HR	Talent Management Recruiting Performance Review Planning Morale	HR Tools External Job Posting Sites Growbot
Cross-organizational Virtual Team	Strategy Workforce Development Compete & Research	Power BI Microsoft Stream

It's possible to create Teams that align with the organizational structure. This is best used for leaders who want to drive morale, have team-specific reviews, clarify employee onboarding processes, discuss workforce plans, and increase visibility across a diverse workforce.



Org-wide teams

If your organization has no more than 5,000 users, you can create an org-wide team. Org-wide teams provide an automatic way for everyone in an organization to be a part of a single team for collaboration. For more information, including best practices for creating and managing an org-wide team, see Create an org-wide team in Microsoft Teams.

Private channels in Microsoft Teams

6/18/2020 • 9 minutes to read • Edit Online

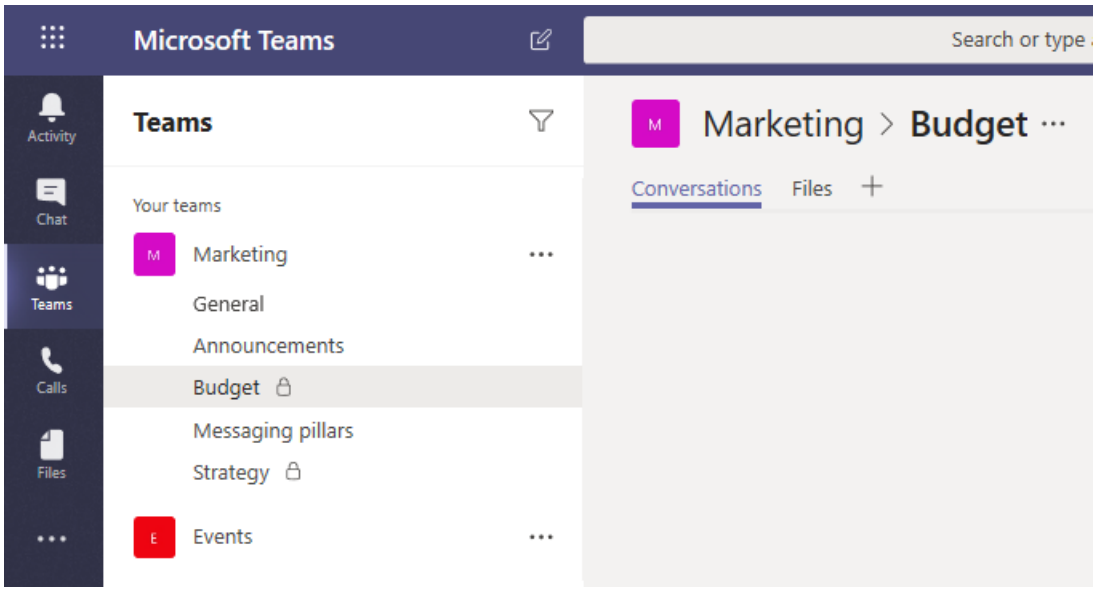
Private channels in Microsoft Teams create focused spaces for collaboration within your teams. Only the users on the team who are owners or members of the private channel can access the channel. Anyone, including guests, can be added as a member of a private channel as long as they are already members of the team.

You might want to use a private channel if you want to limit collaboration to those who have a need to know or if you want to facilitate communication between a group of people assigned to a specific project, without having to create an additional team to manage.

For example, a private channel is useful in these scenarios:

- A group of people in a team want a focused space to collaborate without having to create a separate team.
- A subset of people in a team want a private channel to discuss sensitive information, such as budgets, resourcing, strategic positioning, and so on.

A lock icon indicates a private channel. Only members of private channels can see and participate in private channels that they are added to.



What you need to know about private channels

Currently, private channels support connectors and tabs (except Stream, Planner, and Forms). We're working on full apps support for private channels, including messaging extensions and bots.

Each team can have a maximum of 30 private channels and each private channel can have a maximum of 250 members. The 30 private channel limit is in addition to the 200 standard channel limit per team.

When you create a team from an existing team, any private channels in the existing team won't be copied over.

> **NOTE**
>
> We're continually adding capabilities to private channels so check back for the most up-to-date information regarding apps, channel meetings, and scaling private channels for large teams.

When to create a private channel

To determine whether a private channel is appropriate, consider the following questions about who needs to work together and what the collaboration is about.

IS THERE ALREADY A TEAM THAT HAS THESE PEOPLE AS TEAM MEMBERS?	DOES THIS WORK NEED TO BE KEPT PRIVATE FROM OTHERS?	ARE THERE MULTIPLE DISTINCT TOPICS TO DISCUSS?	RECOMMENDATION
Yes	Yes	Yes	Create a private channel in the existing team or consider creating dedicated private channels for each topic.
Yes	Yes	No	Create a private channel in the existing team.
Yes	No	No	Create a channel in the existing team.
No	No	No	Consider creating a new team.
No	No	Yes	Consider creating a new team and then, depending on the confidentiality of each topic, consider creating separate standard or private channels for each topic.
No	Yes	No	Create a new team and consider creating a private channel.

When a private channel is created, it's linked to the parent team and can't be moved to a different team. Additionally, private channels can't be converted to standard channels and vice versa.

Private channel creation and membership

Who can create private channels?

By default, any team owner or team member can create a private channel. Guests can't create them. The ability to create private channels can be managed at the team level and at the organization level.

1. Go to the admin center at https://admin.microsoft.com.
2. Use policies to control which users in your organization are allowed to create private channels. Once you've set the policies, team owners can turn off or turn on the ability for members to create private channels in the **Settings** tab for a team.

The person who creates a private channel is the private channel owner and only the private channel owner can directly add or remove people from it. A private channel owner can add any team member to a private channel they created, including guests. Members of a private channel have a secure conversation space, and when new members are added, they can see all conversations (even old conversations) in that private channel.

What happens when a team member leaves or is removed from a team?

If a team member leaves or is removed from a team, that user will also leave or be removed from all private

channels in the team. If the user is added back to the team, they must be added back to the private channels in the team.

What happens when a private channel owner is removed from a private channel?

A private channel owner can't be removed through the Teams client if they are the last owner of one or more private channels.

If a private channel owner leaves your organization or if they are removed from the Microsoft 365 group associated with the team, a member of the private channel is automatically promoted to be the private channel owner.

What can team owners and team members see in a private channel?

Team owners can see the names of all private channels in their team and can also delete any private channel in the team. (A deleted private channel can be restored within 30 days after it's deleted). Team owners can't see the files in a private channel or the conversations and member list of a private channel unless they are members of that private channel.

The following table shows who can see what in a private channel.

ITEM	TEAM OWNER CAN SEE	TEAM MEMBERS CAN SEE
Name and description	All private channels in the team	Only the private channels that they are added to
Conversations and tabs	Only when added to the private channel	Only when added to the private channel
Files and content	Only when added to the private channel	Only when added to the private channel
Private channel owner	All private channels in the team	Only when added to the private channel
Last activity time stamp	All private channels in the team	Only when added to the private channel

Manage private channels

The following table outlines what actions owners, members, and guests can do in private channels.

ACTION	TEAM OWNER	TEAM MEMBER	TEAM GUEST	PRIVATE CHANNEL OWNER	PRIVATE CHANNEL MEMBER	PRIVATE CHANNEL GUEST
Create private channel	Yes[1]	Yes[1,2]	No	N/A	N/A	N/A
Delete private channel	Yes	No	No	Yes	No	No
Leave private channel	N/A	N/A	N/A	Yes[3]	Yes	Yes
Edit private channel	No	N/A	N/A	Yes	No	No

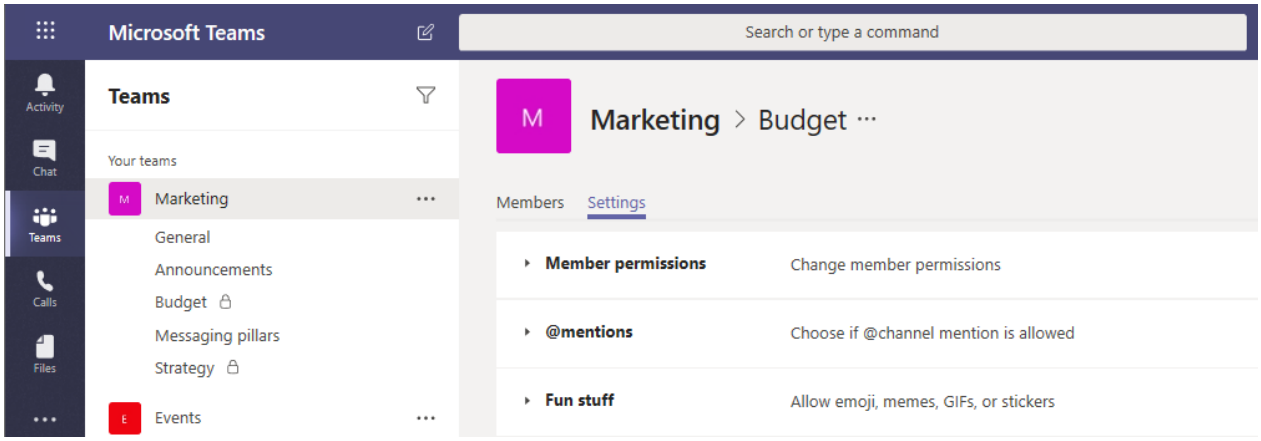
ACTION	TEAM OWNER	TEAM MEMBER	TEAM GUEST	PRIVATE CHANNEL OWNER	PRIVATE CHANNEL MEMBER	PRIVATE CHANNEL GUEST
Restore deleted private channel	Yes	No	No	Yes	No	No
Add members	No	N/A	N/A	Yes	No	No
Edit settings	No	N/A	N/A	Yes	No	No
Manage tabs and apps	No	N/A	N/A	Yes[4]	Yes[5]	No

[1] Assuming the policy that you, the admin, configured allows the user to create private channels.
[2] Each team has a setting that team owners can turn on or off to allow team members to create private channels. Team owners can always create private channels.
[3] Assuming the private channel owner isn't the last owner of the channel.
[4] Requires the team to have an app installed for a private channel to use it.
[5] Private channel owners can configure this.

Manage private channel membership and settings

Each private channel has its own settings, including the ability to add and remove members, add tabs, and @mentioning for the entire channel. These settings are independent of the parent team settings. When a private channel is created, it inherits settings from the parent team, after which its settings can be changed independently of the parent team settings.

The private channel owner can click **Manage channel**, and then use the **Members** and **Settings** tabs to add or remove members and edit settings.



Manage the life cycle of private channels

See Manage the life cycle of private channels in Teams for guidance on how to manage the life cycle of private channels in your organization. This includes how to control whether users in your organization can create private channels, how to create a private channel on behalf of a team owner, how to get a list of all private channel messages for archiving and auditing purposes, and other management tasks.

Private channel SharePoint sites

Each private channel has its own SharePoint site collection. The separate site collection is to ensure access to private channel files is restricted to only members of the private channel compared to the team site where team

owners have access to all the assets within the site collection. These site collections are created with a document library by default, and can be easily enhanced to a full-featured site collection through the site management interface. Each site collection is created in the same geographic region as the site collection of the parent team. These lightweight sites have a custom template ID, "TEAMCHANNEL#0", for easier management through PowerShell and Graph API. By design, they aren't visible in the SharePoint admin center.

To accommodate a greater number of site collections per tenant, the limit has increased from 500,000 to 2,000,000. A private channel site collection syncs data classification and inherits guest access permissions from the site collection of the parent team. Membership to the site collection owner and member groups are kept in sync with the membership of the private channel within Teams. Any changes to the membership of Owner or Member groups in SharePoint Online will be reverted to private channel membership within four hours automatically. In scenarios where certain users need to access documents without needing to access private channel messages, add them to the Visitors group on the site or to a new group that's separate from Owners and Members.

Teams manages the life cycle of the private channel SharePoint site collection. If the site collection is deleted outside of Teams, a background job restores the site within four hours as long as the private channel is still active. If the site is deleted and hard-deleted, a new site collection is provisioned for the private channel.

If a private channel or a team containing a private channel is restored, the site collections are restored with it. If a private channel site collection is restored and it's beyond the 30-day soft delete window for the private channel, the site collection operates as a standalone site collection.

Private channel message compliance records

Records for messages sent in a private channel are delivered to the mailbox of all private channel members, rather than to a group mailbox. The titles of the records are formatted to indicate which private channel they were sent from.

For more information about performing an eDiscovery search for private channel messages, see eDiscovery of private channels.

Considerations around access in private channels

When a new OneNote notebook is created in a private channel, additional users can still get access to the notebook because the behavior is the same as sharing access to any other item in a private channel SharePoint site with a user.

If a user is granted access to a notebook in a private channel through SharePoint, removing the user from the team or private channel won't remove the user's access to the notebook.

If an existing notebook is added as a tab to a private channel, access to the private channel isn't changed. This means the following:

- Not everyone in the private channel will have access to the notebook by default. This is because they may not have access to where the notebook is hosted, such as another team's SharePoint site.
- Users who are not members of the private channel can view the notebook.

Related topics

- Overview of teams and channels in Teams
- Teams PowerShell overview
- Use the Microsoft Graph API to work with Teams

Manage the life cycle of private channels in Microsoft Teams

7/1/2020 • 5 minutes to read • Edit Online

Here you'll find the guidance you need to manage the life cycle of private channels in your organization.

> **IMPORTANT**
>
> If you're using the PowerShell steps in this article to manage private channels, you must install and use the Teams PowerShell public preview module from the PowerShell Gallery. For steps on how to install the module, see Install Microsoft Teams PowerShell. The latest General Availability Teams PowerShell module doesn't support managing private channels.

Set whether team members can create private channels

Team owners can turn off or turn on the ability for members to create private channels in team settings. To do this, on the **Settings** tab for the team, turn off or turn on **Allow members to create private channels**.

As an admin, you can use Graph API to control whether members can create private channels in specific teams. Here's an example.

```
PATCH /teams/<team_id>
{"memberSettings":
  {
    "allowCreatePrivateChannels": false
  }
}
```

Set whether users in your organization can create private channels

As an admin, you can set policies by using the Microsoft Teams admin center or PowerShell to control which users in your organization are allowed to create private channels.

Using the Microsoft Teams admin center

Use teams policies to set which users in your organization are allowed to create private channels. To learn more, see Manage teams policies in Teams.

Using PowerShell

Use **CsTeamsChannelsPolicy** to set which users in your organization are allowed to create private channels. Set the **AllowPrivateChannelCreation** parameter to **true** to allow users who are assigned the policy to create private channels. Setting the parameter to **false** turns off the ability to create private channels for users who are assigned the policy.

To learn more, see New-CsTeamsChannelsPolicy.

Create a private channel on behalf of a team owner

As an admin, you can use PowerShell or Graph API to create a private channel on behalf of a team owner. For example, you may want to do this if your organization wants to centralize creation of private channels.

Using PowerShell

```
New-TeamChannel -GroupId <Group_Id> -MembershipType Private -DisplayName "<Channel_Name>" -Owner <Owner_UPN>
```

Using Graph API

```
POST /teams/{id}/channels
{ "membershipType": "Private",
  "displayName": "<Channel_Name>",
  "members":[{
           "@odata.type":"#microsoft.graph.aadUserConversationMember",
           "user@odata.bind":"https://graph.microsoft.com/beta/users('<user_id>')",
           "roles":["owner"]
            }]
```

Get a list of all private channel messages

You may want to get a list of all messages and replies posted in a private channel for archiving and auditing purposes. Here's how to use Graph API to do this.

```
GET /teams/{id}/channels/{id}/messages
GET /teams/{id}/channels/{id}/messages/{id}/replies/{id}
```

Find SharePoint URLs for all private channels in a team

Whether you're looking to perform eDiscovery or legal hold on files in a private channel or looking to build a custom app that places files in specific private channels, you'll want a way to query the unique SharePoint site collections that are created for each private channel.

As an admin, you can use PowerShell or Graph APIs commands to query these URLs.

Using PowerShell

1. Install and connect to the SharePoint Online Management Shell with your admin account.
2. Run the following, where <group_id> is the Group ID of the team. (You can easily find the Group ID in the link to the team.)

   ```
   $sites = get-sposite -template "teamchannel#0"
   $groupID = "<group_id>"
   foreach ($site in $sites) {$x= Get-SpoSite -Identity
   $site.url -Detail; if ($x.RelatedGroupId -eq $groupID)
   {$x.RelatedGroupId;$x.url}}
   ```

Using Graph API

You can try these commands through Graph Explorer.

1. Use the following to get the list of private channel IDs for a given team, where <group_id> is the group ID of the team. You'll need this in subsequent calls. (You can easily find the group ID in the link to the team).

   #### Request

   ```
   GET https://graph.microsoft.com/beta/teams/<group_id>/channels?$filter=membershipType eq 'private'
   ```

   #### Response

```
HTTP/1.1 200 OK
Content-type: application/json
Content-length:

{
  "value": [
    {
      "description": "description-value",
      "displayName": "display-name-value",
      "id": "channel_id",
      "membershipType": "membership-type-value",
      "isFavoriteByDefault": false,
      "webUrl": "webUrl-value",
      "email": "email-value"
    }
  ]
}
```

2. For each private channel which you want to get the SharePoint URL, make the following request, where <channel_id> is the channel ID.

Request

```
GET https://graph.microsoft.com/beta/teams/<group_id>/channels/<channel_id>/filesFolder
```

Response

```
HTTP/1.1 200 OK
Content-type: application/json
Content-length:

{
  "value": [
    {
      "description": "description-value",
      "displayName": "display-name-value",
      "id": "channel_id",
      "membershipType": "membership-type-value",
      "isFavoriteByDefault": false,
      "webUrl": "webUrl-value",
      "email": "email-value"
    }
  ]
}
```

List and update roles of owners and members in a private channel

You may want to list out the owners and members of a private channel to decide whether you need to promote certain members of the private channel to an owner. This can happen when you have owners of private channels who have left the organization and the private channel requires admin help to claim ownership of the channel.

As an admin, you can use the Microsoft Teams admin center, PowerShell, or Graph API to perform these actions.

Using the Microsoft Teams admin center

To learn how to manage team members using the Microsoft Teams admin center, see Manage teams in the Microsoft Teams admin center.

Using PowerShell

1. Run the following, where <group_id> is the group ID of the team and <channel_name> is the channel

name.

```
Get-TeamChannelUser -GroupId <group_id> -DisplayName "<channel_name>"
```

2. Promote a member to an owner.

```
Add-TeamChannelUser -GroupId <group_id> -DisplayName "<channel_name>" -User <UPN> -Role Owner
```

Using Graph API

You can try these commands through Graph Explorer.

1. Use the following, where <group_id> is the group ID of the team and <channel_id> is the channel ID.

   #### Request

```
GET https://graph.microsoft.com/beta/teams/<group_id>/channels/<channel_id>/members
```

   #### Response

```
HTTP/1.1 200 OK Content-type: application/json
Content-length:
{
      "@odata.context":
"https://graph.microsoft.com/beta/$metadata#teams({group_id}')/channels('{channel_id}')/members",
      "@odata.count": 2,
      "value": [
          {
              "@odata.type": "#microsoft.graph.aadUserConversationMember",
              "id": "id-value",
              "roles": [],
              "displayName": "display-name-value",
              "userId": "userId-value",
              "email": "email-value"
          },
          {
              "@odata.type": "#microsoft.graph.aadUserConversationMember",
          "id": "id-value",
          "roles": ["owner"],
          "displayName": "display-name-value",
          "userId": "userId-value",
          "email": "email-value"
          }
      ]
}
```

2. Use the following to promote the member to an owner, where <group_id>, <channel_id>, and <id> are returned from the previous call. Note that <id> and <userId> returned from the previous call aren't the same and aren't interchangeable. Make sure you use <id>.

   #### Request

```
PATCH
https://graph.microsoft.com/beta/teams/<group_id>/channels/<channel_id>/members/<id>

{
"@odata.type": "#microsoft.graph.aadUserConversationMember",
"roles": ["owner"]
}
```

Response

```
HTTP/1.1 200 OK
Content-type: application/json

{
  "@odata.context":
"https://graph.microsoft.com/beta/$metadata#teams('{group_id}')/channels('{channel_id}')/members/$entity
",
  "@odata.type": "#microsoft.graph.aadUserConversationMember",
  "id": "id-value",
  "roles": ["owner"],
  "displayName": "display-name-value",
  "userId": "userId-value",
  "email": "email-value"
 }
```

Related topics

- Teams PowerShell overview
- Use the Microsoft Graph API to work with Teams
  - List channels
  - Create channel
  - Add member to channel
  - Update member in channel
  - Remove member from channel

Assign team owners and members in Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

IMPORTANT

The Microsoft Teams admin center is gradually replacing the Skype for Business admin center, and we're migrating Teams settings to it from the Microsoft 365 admin center. If a setting has been migrated, you'll see a notification and then be directed to the setting's location in the Teams admin center. For more information, see Manage Teams during the transition to the Teams admin center.

Within Microsoft Teams there are two user roles: **owner** and **member**. By default, a user who creates a new team is granted the owner status. In addition, owners and members can have moderator capabilities for a channel (provided that moderation has been set up). If a team is created from an existing Microsoft 365 Group, permissions are inherited.

The table below shows the difference in permissions between an owner and a member.

TASK	TEAM OWNER	TEAM MEMBER
Create team	Yes[1]	No
Leave team	Yes	Yes
Edit team name/description	Yes	No
Delete team	Yes	No
Add standard channel	Yes	Yes[2]
Edit standard channel name/description	Yes	Yes[2]
Delete standard channel	Yes	Yes[2]
***Add private channel**	Yes	Yes[2]
***Edit private channel name/description**	No	N/A
***Delete private channel**	Yes	No
Add members	Yes[3]	No[4]
Request to add members	N/A	Yes[5]
Add apps	Yes	Yes[2]

[1] Team owners can create teams unless they've been restricted from doing so. Permissions to create teams below.

[2] An owner can turn off these items at the team level, in which case members would not have access to them.

[3] After adding a member to a team, an owner can also promote a member to owner status. It is also possible for an

owner to demote their own status to a member.
[4] Team members can add other members to a public team.
[5] While a team member can't directly add members to a private team, they can request someone to be added to a team they're already a member of. When a member requests someone to be added to a team, team owners receive an alert that they have a pending request that they can accept or deny.

*To learn more about permissions for private channels, see Private channels in Teams.

> **NOTE**
> Owners can make other members owners in the **View teams** option. A team can have up to 100 owners. We recommend that you have at least a few owners to help manage the team; this will also prevent orphaned groups if a sole owner leaves your organization. For more information about orphaned groups, see Assign a new owner to an orphaned group.

Moderator capabilities

In addition to other capabilities, team owners and members can have moderator capabilities for a channel (provided that moderation is turned on for a team). Moderators can start new posts in a channel and control whether team members can reply to existing channel messages. They can also control whether bots and connectors can submit channel messages.

Moderator capabilities are assigned at the channel level. Team owners have moderator capabilities by default. Team members have moderator capabilities turned off by default, but a team owner can give moderator capabilities for a channel to a team member. Moderators within a channel can add and remove other moderators within that channel.

For more information about moderator capabilities, see Set up and manage channel moderation in Microsoft Teams.

Assign a user role

To assign a user role, in Teams, select the team name and click **More options** > **Manage team**. On the **Members** tab, you can add members and choose owners and moderators (if you have sufficient permissions). For more information , see Change team settings in Teams.

Permissions to create teams

By default, all users with a mailbox in Exchange Online have permissions to create Microsoft 365 groups and therefore a team within Microsoft Teams. You can have tighter control and restrict the creation of new teams and thus the creation of new Microsoft 365 groups by delegating group creation and management rights to a set of users. For instructions, see Manage who can create Microsoft 365 Groups.

ICON	TITLE	DESCRIPTION
	Decision Point	Will all Microsoft Teams users be able to create Teams (recommended)?
	Next Steps	Modify the default permissions for who can create Microsoft 365 groups if you need to limit who can create Teams

Overview of dynamic membership for teams

8/6/2020 • 2 minutes to read • Edit Online

Microsoft Teams supports teams associated with Microsoft 365 groups by using *dynamic membership*. Dynamic membership enables the membership of a team to be defined by one or more rules that check for certain user attributes in Azure Active Directory (Azure AD). Users are automatically added or removed to the correct teams as user attributes change or users join and leave the tenant.

With dynamic membership you can set up teams for certain cohorts of users in your organization. Possible scenarios include:

- A hospital can create distinct teams for nurses, doctors, and surgeons to broadcast communications. This is especially important if the hospital relies on temp employees.
- A university can create a team for all faculty within a particular college, including an adjunct faculty that changes frequently.
- An airline wants to create a team for each flight (like a Tuesday afternoon non-stop from Chicago to Atlanta) and have a frequently changing flight crew automatically assigned or removed as needed.

Using this feature, a given team's members update automatically based on a specific set of criteria, instead of manually managing membership. Doing this requires Azure AD Premium P1 licenses and team membership can be assigned by a tenant admin to any user's Azure AD properties provided you have a tenant and an admin account.

Microsoft Teams may take anywhere from a few minutes to up to 2 hours to reflect dynamic membership changes once they take effect in the Microsoft 365 group for a team.

NOTE

- Rules can define who is a team member, but not who is a team owner.
- See Limits and specifications for Microsoft Teams for current limits on team and channel sizes.
- Owners will not be able to add or remove users as members of the team, since members are defined by dynamic group rules.
- Members will not be able to leave teams backed by dynamic groups.

Creating and managing a Microsoft 365 group with dynamic membership

While logged in as the tenant admin, follow the instructions in Create a dynamic group and check status. As needed, refer to Dynamic membership rules for groups in Azure Active Directory.

Create a new team with your Microsoft 365 group

Now allow time for the membership changes to take effect, and create a new team as described in Create a team from an existing group.

Apply dynamic membership to an existing team

You can also take an existing team and change it to have a dynamic membership, as described in Change static group membership to dynamic in Azure Active Directory.

Changes in client behavior

Once dynamic membership is enabled for a team, Teams clients will no longer allow member management for the team. Options to add members, edit member roles, send and approve join requests, and leave the team are all hidden.

Best practices for organizing teams in Microsoft Teams

8/6/2020 • 3 minutes to read • Edit Online

Teams are collections of people who gather together around a common goal. This group of people may be within a department or across the organization. What brings them together is the outcome they are driving toward. Members of a team may work at a different pace or create assets differently, but in our experience they often collaborate quickly with each other, a process we call "high velocity teamwork."

Before creating a team, think about the goal, project, or work items and who in your organization can help deliver it collaboratively. Once you've identified them, add these people or groups to a team to start collaborating. Because membership can change over time, it's a good idea to designate multiple owners for each team. For more information, see Managing teams.

Take a look at this short video to see some examples of how to structure cross-organizational or single purpose teams:

Add teams gradually

When you first roll out Teams, we recommend starting with a small number of teams and team members. Add new people or groups as you go. The great thing with Teams is that, when you add new people or groups, they can quickly get up to speed on what's already been discussed, as the conversations and files are available to users regardless of when they join. Avoid the temptation to create a bunch of different teams that have the same set of members; instead, create channels in a single team.

Create channels to focus discussions

Once you've created your team, it's a good idea to start to think about the different projects and types of conversations you need to support. Create initial channels so people know where to contribute and to find existing conversations. Use descriptive channel names, to make it easy for people to know where to go for each conversation. Add tools (such as OneNote, Power BI, or Planner) as tabs to a channel so members have everything they need, right in the channel. You can also add a commonly used web page as a tab to a channel.

Learn more about working in teams with these quick tips for end users.

Best practice: Create teams with a larger set of members and more channels. Minimize the number of teams that require a person's participation. Channels within a team should be thought of as topics or workstreams to aid the team in organizing their work to deliver on their joint objectives. There is no specific number of channels that should be created. Each team should craft channels based on their work, priorities, and style.

Use standard channels for conversations that everyone on the team can contribute to. Take advantage of Private channels in Teams when you need a focused collaboration space with a select group of members.

Larger organizations may want to create teams as "templates" to standardize the information they capture about specific types of work. This is useful for strategic customer management, classroom management, health care scenarios, claim management, incident management and other scenarios appropriate to a specific industry. To learn more, check out Get started with Teams templates and Teams templates for small and medium businesses.

Use the General channel

By default, the **General channel** is created for you when you create the team. There are many useful purposes for this channel:

- Use it to share an overview of what the team wants to achieve such as a project charter or who's who in the team.
- Use it for new team member onboarding and other high-level information that a new team member would find useful.
- Use it for announcements, or configure the SharePoint News connector to post your modern status reports to this channel.
- For new or single purpose teams, it may be the only channel at the beginning as you decide how Teams can best support your goals.

You can't remove, rename, or unfavorite the General channel. Channels appear in alphabetical order (with the General channel at the top). In teams with many channels, use **Hide** or **Show** to display the channels you use the most.

To learn more, peruse the **Work in channels** tab on the Teams and channels page.

Consider setting up moderation in your channels

Team owners can turn on moderation for a channel to control who can start new posts and reply to posts in that channel. When you set up moderation, you can choose one or more team members to be moderators. (Team owners are moderators by default.) For more information, see Set up and manage channel moderation in Microsoft Teams.

Related topics

- Create an org-wide team in Teams
- Limits and specifications for Microsoft Teams

Manage large teams in Microsoft Teams - Best practices

8/6/2020 • 3 minutes to read • Edit Online

Microsoft Teams is equally effective at facilitating communications between small groups with dozens of members and large groups with thousands of members. Review Limits and specifications for Teams for updates on team sizes. Increase in team size leads to unique management and operational challenges. This article describes best practices for creating and managing large teams comprised of thousands of members.

Value of large teams

Large teams are very useful in enabling the following collaboration scenarios:

- **Department-wide collaboration**: If your organization has multiple departments such as Finance, Operations, R&D etc., then you can create a single team that includes all members in a specific department. Now all communications relevant to a department can be shared in this team, which facilitates instant reach and engagement from members.
- **Collaboration in employee resource groups**: Organizations often have large groups of people with mutual interests who belong to a different department or work group. As an example, there can be a group of people who share a passion for personal finance and investing. It's often hard to connect in a large organization. To develop communities for such groups, tenant admins can create a large team that serves as a public company-wide resource group that anyone can join and take advantage of. Eventually, these communities collect information that both new and existing members can enjoy.
- **Collaboration between internal and external members**: Popular products often develop a community of early adopters who are eager to try new product releases and provide feedback. Early adopters develop a relationship with product groups to help shape the product. In such scenarios, tenant admins can set up a large team which includes both internal product groups and external product evaluators to facilitate a rich product development process. These teams can also provide customer support to a select set of customers.

Create teams from existing groups

Use contact groups, security groups, or Office groups to jump start your team. You can import a group to make a team or create a team from an Office group.

Import a group to make a team: When you import a group with up to 3,500 members into Teams, Teams automatically calculates the total number of members in the group. This is a one-time import only and future changes in the group will not automatically be updated in Teams.

Create a team from a large Microsoft 365 group: When you create a team from a large Microsoft 365 group, members are automatically part of the Microsoft 365 group **and** the team. In the future, as team members join or leave the Microsoft 365 group, they're automatically added or removed from the team.

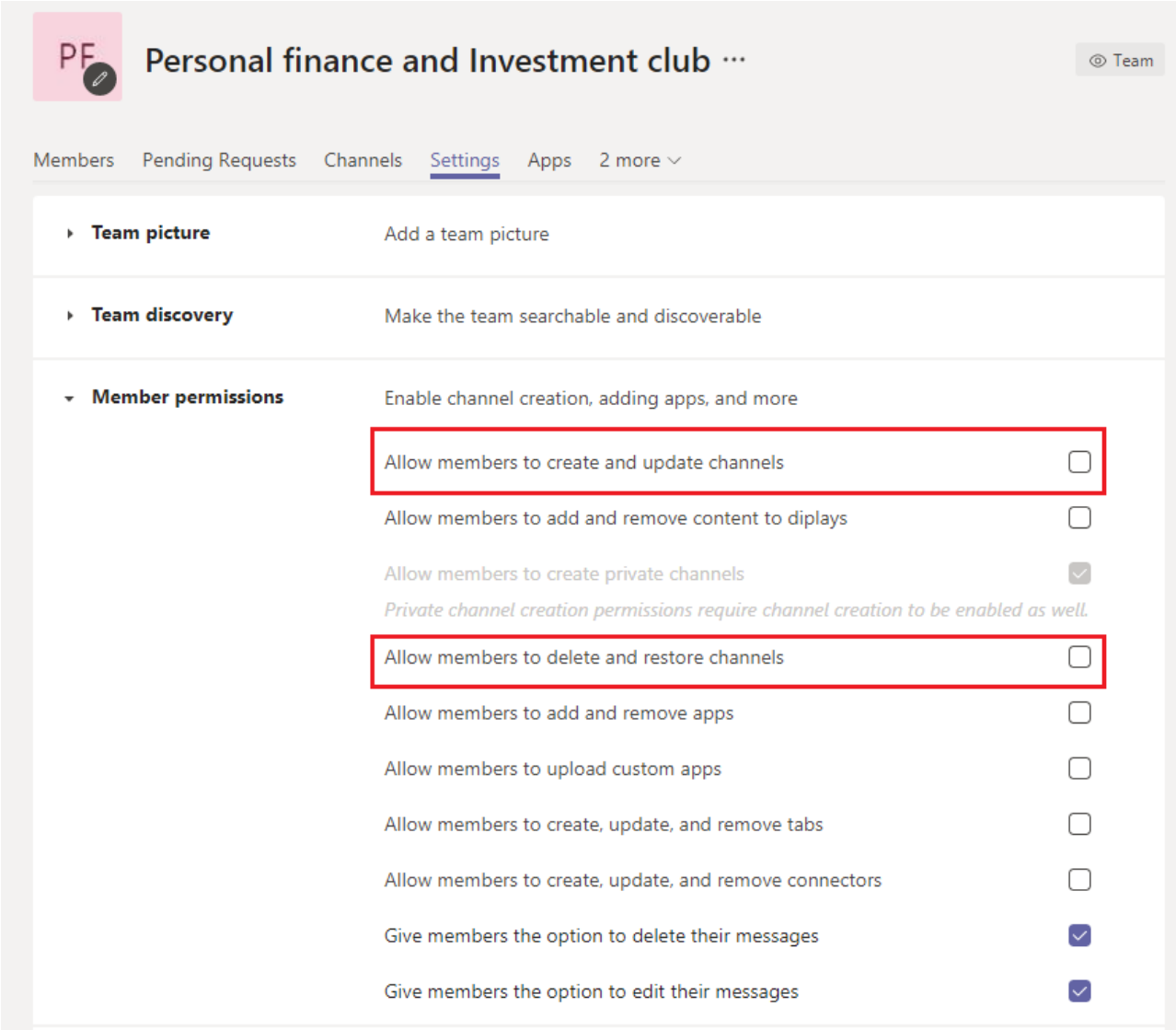
Create channels to focus discussions

You can narrow the group discussions by creating focused channels. See Best practices for organizing teams.

Restrict channel creation

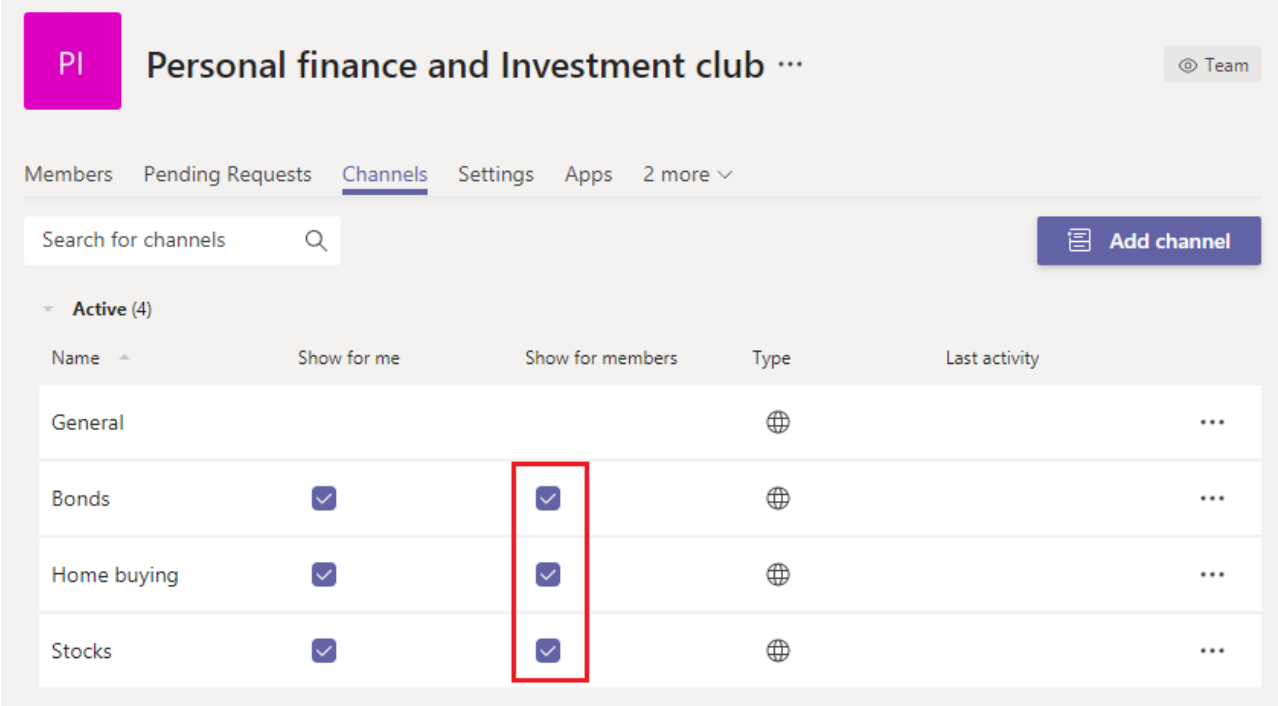
If any team member is allowed to create channels, that team can have channel sprawl. Team owners should turn off

channel create, update, delete, and restore for members in **Settings** > **Member permissions**. See Overview of teams and channels.



Add favorite channels

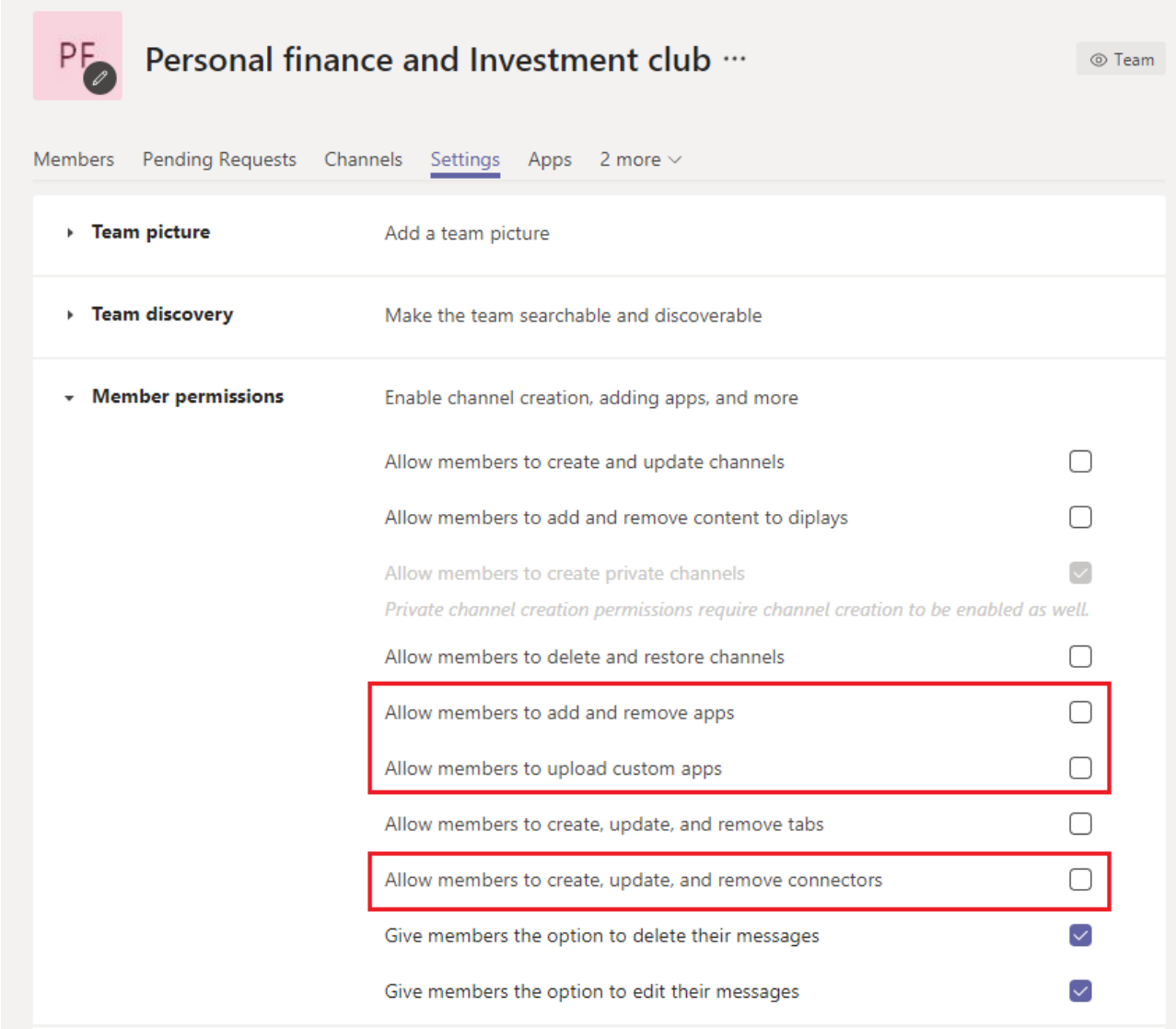
In order to speed up new user engagement and content discovery, you can select favorite channels that are available to the user by default. In the **Channels** pane of the admin center, check the channels under the **Show for members** column.



See Create your first teams and channels for details.

Regulate applications and bots in large teams

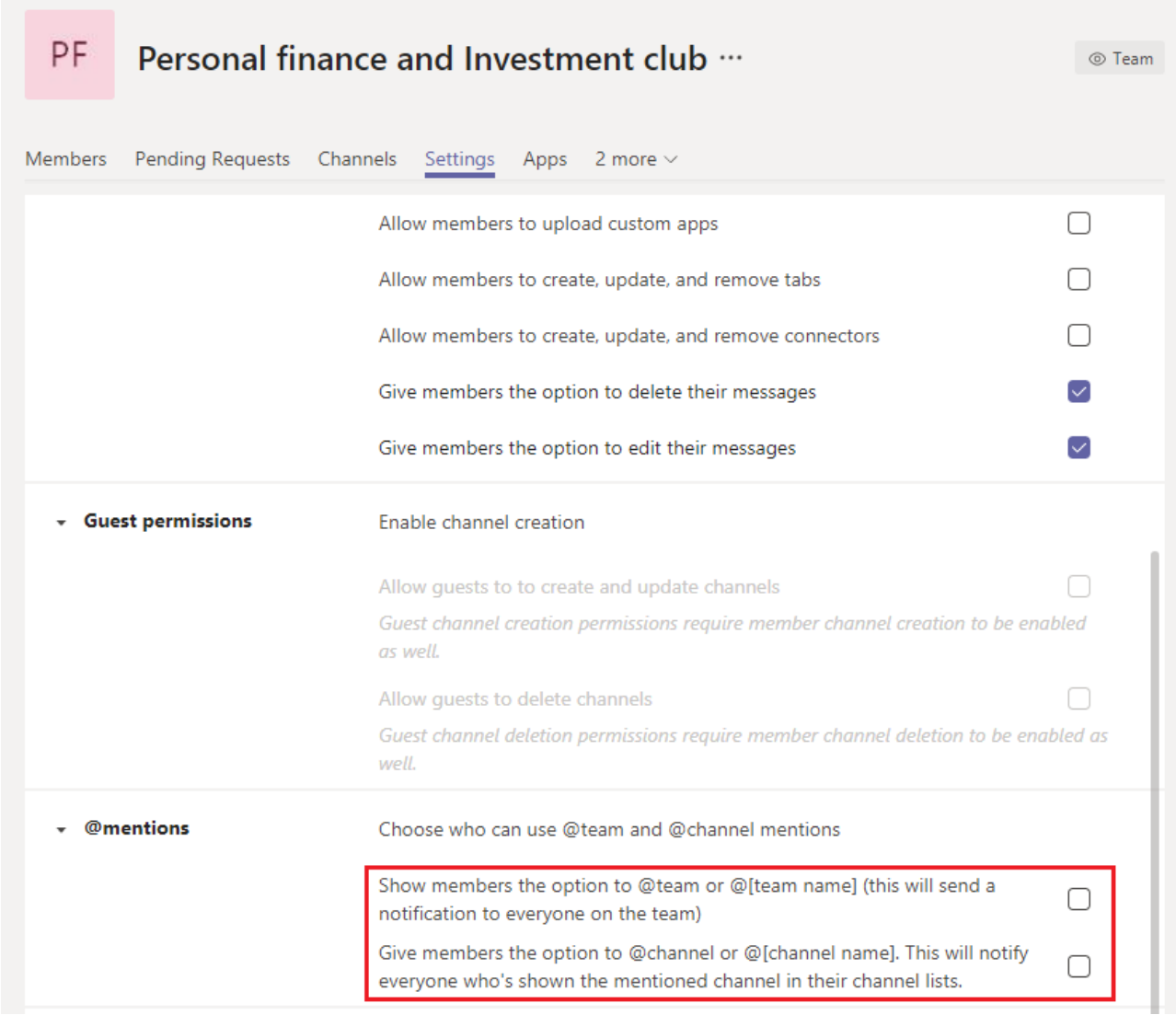
To prevent addition of distracting applications or bots, team owners can disable, add, remove, and upload apps and connectors for team members. In the admin center under **Settings > Member permissions**, uncheck the three options that allow members to add apps or connectors.



See Apps, bots, & connectors.

Regulate team and channel mentions

Team and channel mentions can be used to draw the attention of the whole team to certain channel posts. Once a mention is used in a post, a notification is sent to thousands of team members. If the notifications are too frequent, then team members can become overloaded and might complain to team owners. To prevent team or channel mentions, turn off team and channel mentions for members by unchecking the boxes in the teams **Settings > @mentions** pane.



Consider setting up moderation in your channels

Team owners can turn on moderation for a channel to control who can start new posts and reply to posts in that channel. When you set up moderation, you can choose one or more team members to be moderators. Team owners are moderators by default. For more information, see Set up and manage channel moderation.

Related topics

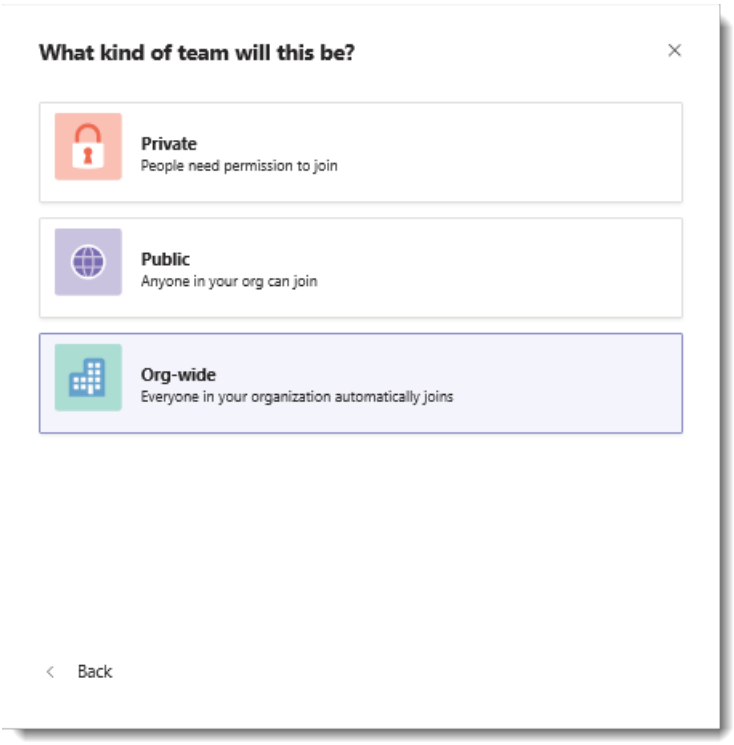
- Best practices for organizing Teams
- Create an org-wide team

Create an org-wide team in Microsoft Teams

10/5/2020 • 4 minutes to read • Edit Online

Org-wide teams provide an automatic way for everyone in a small to medium-sized organization to be a part of a single team for collaboration.

With org-wide teams, global admins can easily create a public team that pulls in every user in the organization and keeps the membership up to date with Active Directory as users join and leave the organization. Only global admins can create org-wide teams and currently, an org-wide team is limited to organizations with no more than 5,000 users. There's also a limit of five org-wide teams per tenant. If these requirements are met, global admins will see **Org-wide** as an option when they select **Build a team from scratch** when creating a team.



When an org-wide team is created, all global admins and Teams service administrators are added as team owners and all active users are added as team members. Unlicensed users are also added to the team. The first time an unlicensed user signs in to Teams, the user is assigned a Microsoft Teams Exploratory license. To learn more about the Exploratory license, check out Manage the Microsoft Teams Exploratory license.

These types of accounts won't be added to your org-wide team:

- Accounts that are blocked from sign in
- Guest users
- Resource or service accounts (for example, accounts associated with auto attendants and call queues)
- Room or equipment accounts
- Accounts backed by a shared mailbox

As your organization's directory is updated to include new active users or if users no longer work at your company and their account is disabled, changes are automatically synced and the users are added or removed from the team. Team members can't leave an org-wide team. As a team owner, you can manually add or remove users if needed.

NOTE

- If you don't see the **Org-wide** option when creating a team and you're a global admin, you might have reached the five org-wide teams limit, or your organization might have more than the current size limit of 5,000 members. We're looking to increase this limit in the future. Org-wide teams aren't yet available for Teams for Education.
- Rooms that aren't a part of a room list, equipment, and resource accounts might be added or synced to the org-wide team. Team owners can easily remove these accounts from the team.
- All actions by the system to add or remove members are posted in the General channel. The channel will also be marked as having new activity in the Teams client.
- We'll automatically create an org-wide team for your organization if your organization is new to Teams and has no more than 5,000 users. The team name will reflect the tenant name and will have a General channel. Global admins can edit this team like any other team.

Best practices

To get the most out of your org-wide team, we recommend team owners do the following.

Allow only team owners to post to the General channel

Reduce channel noise by having only team owners post to the General channel. Go to the team, locate the General channel, and then select **ύύύ More options** > **Manage channel**. On the **Channel settings** tab, click **Permissions**, and then select **Only owners can post messages**.

Turn off @team and @[team name] mentions

Reduce @mentions to keep them from overloading the entire organization. Go to the team and click **ύύύ More options** > **Manage Team**. On the **Settings** tab, click **@mentions** > turn off **Show members the option to @team or @[team name]**.

Automatically show important channels

Show important channels to ensure everyone in your organization engages in specific conversations. To learn more, see Auto-favorite channels for the whole team.

Set up channel moderation

Consider setting up channel moderation and giving moderator capabilities to certain team members. (When moderation is set up, team owners are given moderator capabilities automatically.) Moderators can control who can start a new post in a channel, add and remove moderators, control whether team members can reply to existing channel messages, and control whether bots and connectors can submit channel messages. For more information, see Set up and manage channel moderation in Microsoft Teams.

Remove accounts that might not belong

Even though members can't leave an org-wide team, as a team owner, you can manage the team roster by removing accounts that don't belong. **Make sure you use Teams to remove users from your org-wide team**. If you use another way to remove a user, such as the Microsoft 365 admin center or from a group in Outlook, the user might be added back to the org-wide team.

FAQ

Is there a way to create an org-wide team other than using the Teams client?

Global admins can only create an org-wide team by using the Teams client. If your organization limits creating teams to using PowerShell, the recommended workaround is to add your global admins to the security group of users who can create a team. For more information, see Manage who can create groups.

If this isn't an option, you can use PowerShell to create a public team and add a global admin as the team owner. Then, have the global admin click **More options** next to the team name, click **Edit team**, and then change the

privacy to **Org-wide - Everyone in your organization will be automatically added**. Note that only team owners can access the **Edit team** option and only global admins can see the **Org-wide** option.

Is there a way to convert an existing team to an org-wide team?

Global admins can convert an existing team to an org-wide team by editing it in Teams client. Go to the team name, click **More options** > **Edit team**.

Can I create an org-wide team using a team template?

Team templates can't be used to create an org-wide team. Work for this feature is currently in progress.

See also

Watch a video about creating a company-wide team in Microsoft Teams.

Create people manager teams in Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

When you roll out Microsoft Teams, rather than launching with a "blank slate" (no teams or channels), we strongly recommend that you set up a base framework of teams and channels. This helps to prevent "team sprawl," where users create numerous teams when they should be creating channels in existing teams. To help you get started with a well-designed teams and channels structure, we've created a PowerShell script that creates a team for each of your first and second line people managers, with each manager's direct reports as team members. This is a "point-in-time" script (it doesn't update your teams or channels automatically when people are added or removed from an organization). But it's a valuable tool you can use to impose some order on your Teams structure from the start. This script reads your Azure AD, gets a list of managers and their direct reports. It uses this list to create one team per people manager.

How to use the PowerShell script

Start by running the Export managers and their directs script (which assumes you've already run the Connect-AzureAd and Connect-MicrosoftTeams PowerShell modules). The *Export managers and their directs* script creates a tab-delimited file (ExportedManagerDirects.txt) that lists all managers with their direct reports.

Then, run the Create new people manager teams script. This script reads in the ExportedManagerDirects.txt file and creates a team for each manager, with that manager's direct reports as members. If any manager or direct isn't enabled for Teams, the script skips them and doesn't create a team. (Review the report, then rerun the script after you've turned on Teams for anybody who needs it. The script won't create a second team for any manager it's already created a team for.)

For each team, the script creates a General and "Just for fun" channel.

Best practices

- Ask each people manager to add your organization's crisis communications website as a tab to the General channel for each team.
- Check out the new Crisis Communications app by reading this March 8, 2020 blog post: Coordinate crisis communications using Microsoft Teams + Power Platform.

Related topics

Best practices for organizing teams

Create an org-wide team in Teams

Manage teams policies in Microsoft Teams

9/28/2020 • 2 minutes to read • Edit Online

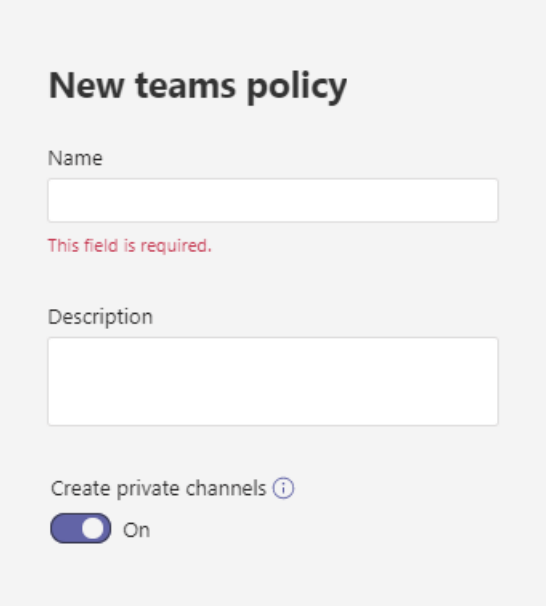
As an admin, you can use teams policies in Microsoft Teams to control what users in your organization can do in teams and channels. For example, you can set whether users are allowed to create private channels.

You manage teams policies by going to **Teams** > **Teams policies** in the Microsoft Teams admin center. You can use the global (Org-wide default) policy or create and assign custom policies. Users in your organization will automatically get the global policy unless you create and assign a custom policy.

You can edit the global policy or create and assign a custom policy. After you edit the global policy or assign a policy, it can take a few hours for changes to take effect.

Create a custom teams policy

1. In the left navigation of the Microsoft Teams admin center, go to **Teams** > **Teams policies**.
2. Click **Add**.
3. Enter a name and description for the policy.



4. Turn on or turn off **Create private channels**, depending on whether you want to allow users to create private channels.
5. Click **Save**.

Edit a teams policy

You can edit the global policy or any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams** > **Teams policies**.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. Turn on or turn off the settings that you want, and then click **Save**.

Assign a custom teams policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Related topics

Private channels in Teams

Assign policies to your users in Teams

Sensitivity labels for Microsoft Teams

10/15/2020 • 5 minutes to read • Edit Online

Sensitivity labels allow Teams admins to regulate access to sensitive organizational content created during collaboration within teams. You can define sensitivity labels and their associated policies in the Security & Compliance Center. These labels and policies are automatically applied to teams in your organization.

What's the difference between sensitivity labels and Teams classification labels?

Sensitivity labels are different from classification labels that require you to create them using PowerShell. Classification labels are text strings that can be associated with a group but don't have any actual policies associated with them. You use classification labels as metadata to manually enforce policies through internal tools and scripts.

On the other hand, sensitivity labels and their policies are automatically enforced end-to-end through a combination of the Groups platform, Security & Compliance Center, and Teams services. Sensitivity labels provide powerful infrastructure support for securing your organization's sensitive data.

To migrate your existing Groups from using classification labels to using sensitivity labels, use the instructions in Azure Active Directory classification and sensitivity labels for Microsoft 365 groups.

Create, manage, and publish sensitivity labels for Teams

For how to enable, create, and publish sensitivity labels for Teams, see Azure Active Directory classification and sensitivity labels for Microsoft 365 groups.

> **IMPORTANT**
>
> Creating, updating and deleting sensitivity labels require careful sequencing with publishing labels to users. Any deviation in the sequence can result in persistent team creation errors for all users. Therefore, it's critical to do the following when you create and publish labels, modify and delete published labels, and manage team creation errors.

Create and publish labels

When a label is created and published in the Security & Compliance Center, it can take up to 10 minutes for the label to become visible in the teams creation interface. Use the following steps to publish the label for all users in the tenant:

1. Create the label and publish it for a few select user accounts in the tenant.
2. When the label is published, wait 10 minutes.
3. After 10 minutes, try to create a team with the label using one of the user accounts that have access to the label.
4. If the team successfully created in step 3, then go ahead and publish the label for the remaining users in the tenant.

Modify and delete published labels

Deleting or modifying the label while it's associated with sensitivity policies can result in team creation failures across the tenant. Therefore, before you delete or modify a label, you must first disassociate the label from its associated policies. Use the following steps
to delete or modify a label:

1. Remove the label from all policies that use the label. Alternatively, you can also delete the policies themselves.
2. When the label is removed from the policies or the policies themselves are deleted, wait 10 minutes before proceeding further.
3. After 10 minutes, launch the team creation interface and ensure that the label is no longer visible for any user in the tenant.
4. Now you can safely delete or modify the label.

Manage team creation errors

If team creation begins to fail at any point during the public preview, you have two options:

- Ensure that sensitivity labels are not mandatory for any user during team creation.
- Turn off sensitivity labels using the scripts in Enable this preview.

Note that the EnableMIPLabels setting must be set to false as follows:

```
$setting["EnableMIPLabels"] = "False"
```

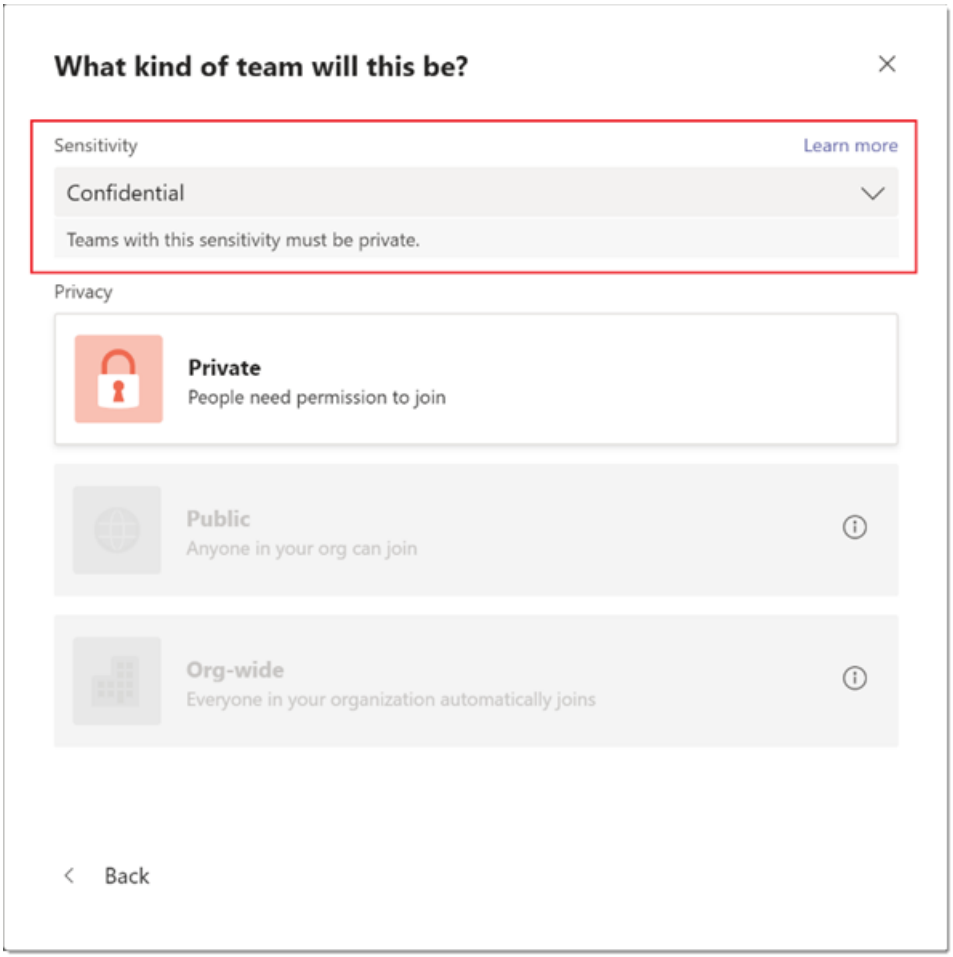
Using sensitivity labels with Teams

Here are some example scenarios of how you can use sensitivity labels with Teams in your organization.

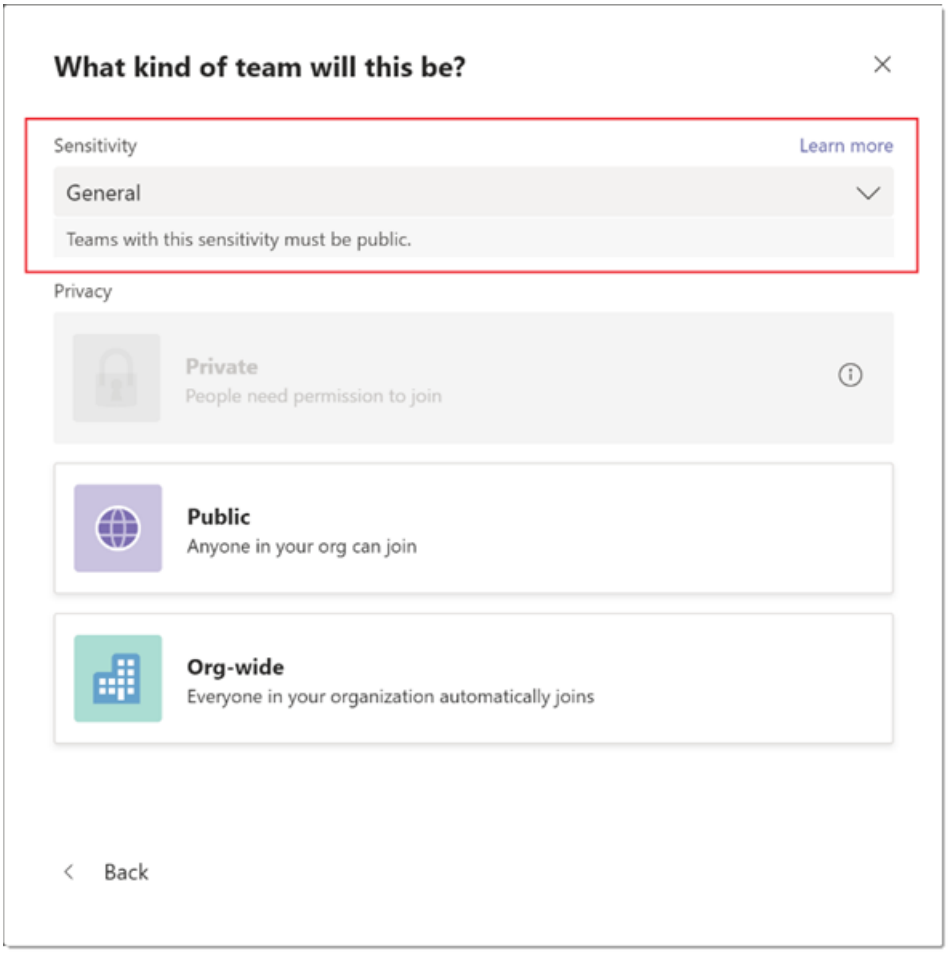
Privacy setting of teams

You can create a sensitivity label that, when applied during team creation, allows users to create teams with a specific privacy (public or private) setting.

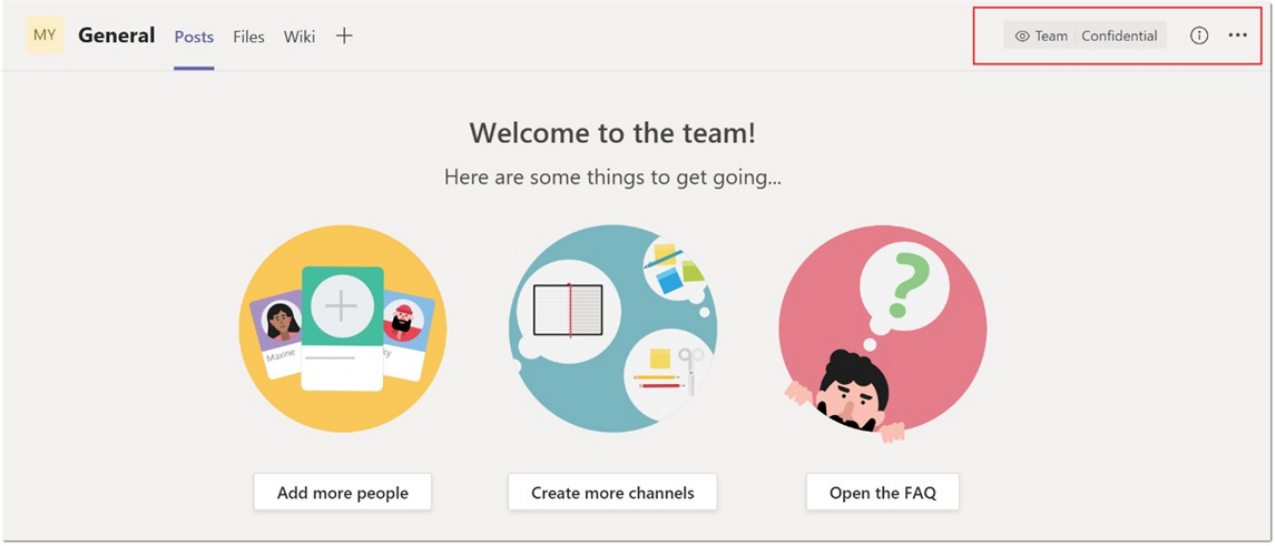
For example, you create a label named "Confidential" in the Security & Compliance Center and you configure Teams so that any team that's created with this label must be a private team. When a user creates a new team and selects the **Confidential** label, the only privacy option that's available to the user is **Private**. Other privacy options such as Public and Org-wide are disabled for the user.



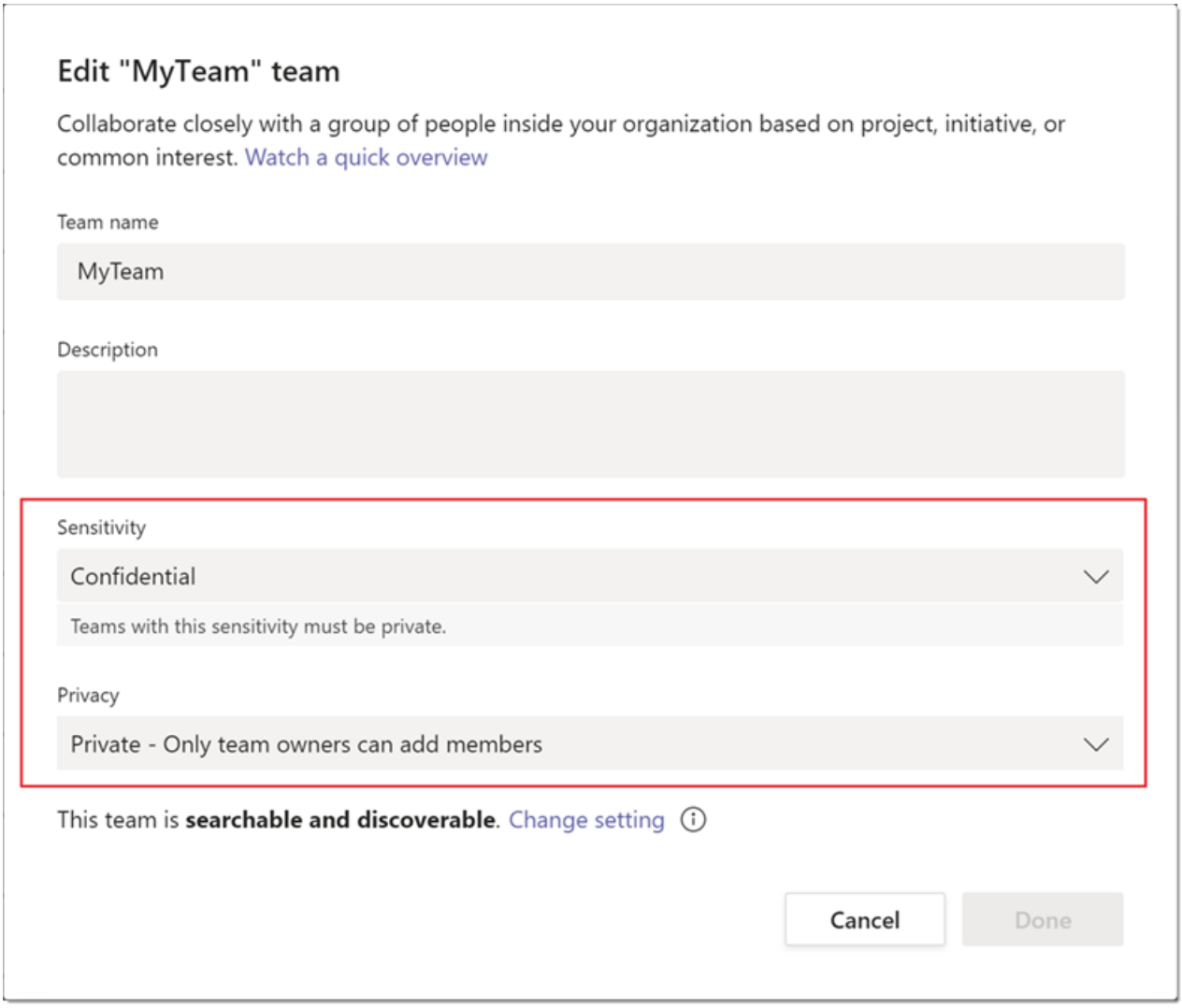
Similarly, if the user selects **General** when they create a new team, they can only create public or org-wide teams.



When the team is created, the sensitivity label is visible in the upper-right corner of channels in the team.



A team owner can change the sensitivity label and the privacy setting of the team at any time by going to the team, and then clicking **Edit team**.



Guest access to teams

You can specify whether a team created with a specific label allows guest access. Teams created with a label that doesn't allow guest access are only available to users in your organization. People outside your organization can't be added to the team.

Sensitivity labels in the Microsoft Teams admin center

You can set sensitivity labels when you create or edit a team in the Microsoft Teams admin center. Sensitivity labels

are also visible in team properties and in the **Classification** column on the Manage teams page of the Microsoft Teams admin center.

Known issues

Support for sensitivity labels in Teams Graph APIs, Powershell cmdlets and templates

Currently, users won't be able to apply sensitivity labels on teams that are created directly through Graph APIs, Powershell cmdlets, and templates.

Support for sensitivity labels in Teams EDU SKUs

Sensitivity labels are currently unsupported for customers using Teams Education SKUs.

Editing sensitivity labels directly on a SharePoint site collection for private channels

Private channels that are created in a team inherit the sensitivity label which was applied on a team. Furthermore, the same label is automatically applied on the SharePoint site collection for the private channel.

If a user directly updates the sensitivity label on a SharePoint site collection for a private channel, that label isn't updated in the Teams client. In this scenario, users will continue to see the sensitivity label applied on a team in the private channel header.

Propagation times for changes applied to sensitivity labels outside the Teams app

Changes made to sensitivity labels outside the Teams app can take up to 24 hours to reflect in the Teams app. This applies to any changes made to enable or disable labels for a tenant, changes to label names, settings, and policies.

Additionally, any changes to a label made directly to a group or SharePoint site collection that backs the team can take up to 24 hours to propagate to the Teams app.

Set up and manage channel moderation in Microsoft Teams

4/14/2020 • 2 minutes to read • Edit Online

In Microsoft Teams, team owners can turn on moderation for a standard channel to control who can start new posts and reply to posts in that channel.

Team owners can also add team members as moderators. A team owner might not have the subject matter expertise at the channel level to best support channel moderation. By allowing specific team members to moderate a channel, the responsibility of managing content and context within a channel is shared between team owners and channel moderators. For example, a team owner can add business owners or content owners as moderators, which lets them control information sharing in that channel.

> **NOTE**
> Channel moderation is available for standard channels. It's not available for the General channel or private channels.

What can a channel moderator do?

Channel moderators can:

- Start new posts in the channel. When moderation is turned on for a channel, only moderators can start new posts in that channel.
- Add and remove team members as moderators to a channel. Keep in mind that by default, team owners are channel moderators and can't be removed.
- Control whether team members can reply to existing channel messages and whether bots and connectors can submit channel messages.

Scenarios

Here's some examples of how your organization can use channel moderation in Teams.

Use a channel as an announcement channel

The Marketing team uses a specific channel to share key project announcements and deliverables. Sometimes team members post content to the channel that more appropriately belongs in other channels. The team owner wants to restrict information sharing in the channel to only announcements so that team members can use that channel to stay on top of what's important.

In this scenario, the team owner adds Marketing leads as moderators so they can post announcements in the channel and turns off the ability for team members to reply to messages in that channel.

Use a channel for class discussions in Teams for Education

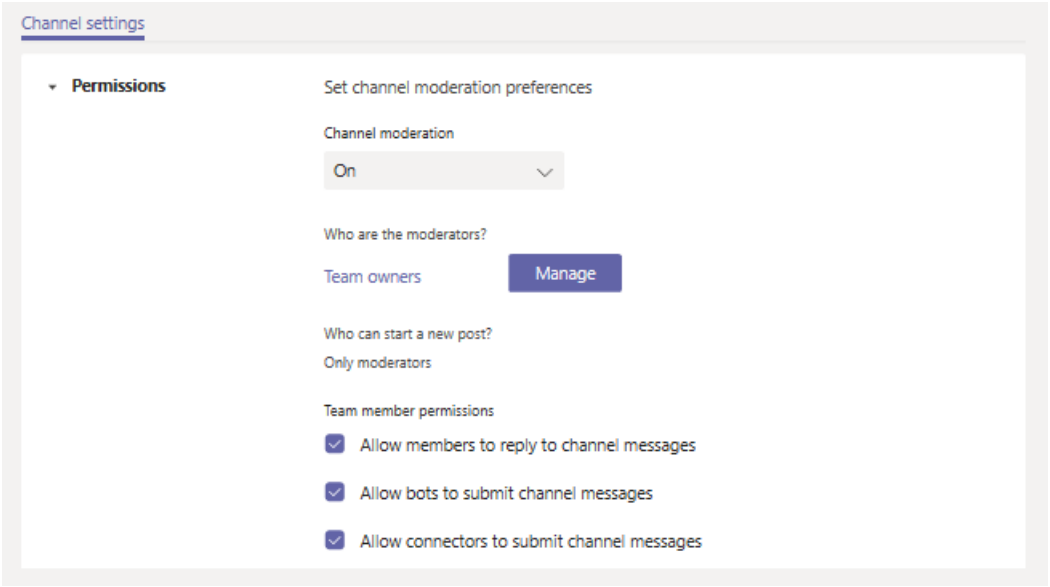
In Teams for Education, a science teacher wants to use a channel to engage students in focused discussions on specific classroom topics.

In this scenario, the teacher allows their teaching assistants to moderate the channel. The teaching assistants can then create new posts to initiate and drive discussions with students.

Manage channel moderation

In Teams, go to the channel, click **More options ...** > **Manage channel**. From here you can turn on and turn off moderation, add team members as moderators, and set preferences.

Channel moderation is a per-channel setting. There's no tenant-level setting for channel moderation. If you'd like us to add a tenant-level channel moderation setting, request it on Teams UserVoice.



Turn on or turn off moderation for a channel

By default, moderation is off, which means that the usual channel settings apply to team owners and team members. For example, you can restrict new posts to only team members or allow everyone, including guests, to start new posts.

To turn on moderation for a channel, under **Channel moderation**, click **On**. When channel moderation is on, only moderators can start new posts.

Add or remove channel moderators

Under **Who are the moderators?**, click **Manage**, and then add or remove team members as moderators. Team owners and moderators can add and remove other moderators.

Set team member permissions

Under **Team member permissions**, select the check boxes next to the activities you want to allow.

Related topics

- Overview of teams and channels in Teams

Sharing files in Microsoft Teams

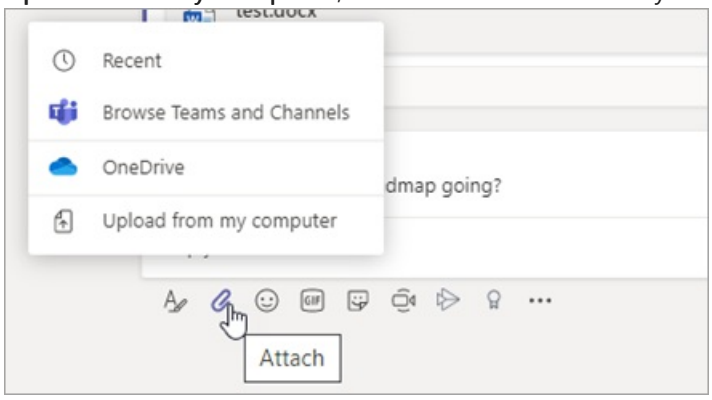
7/14/2020 • 3 minutes to read • Edit Online

In Microsoft Teams, users can share content with other Teams users within and outside their organization. Sharing in Teams is based on the settings configured in SharePoint and OneDrive, so whatever you set up for SharePoint and OneDrive will control sharing in Teams as well.

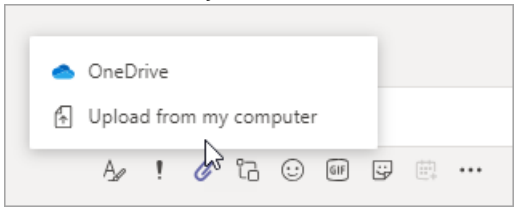
Overview

Users can share files from OneDrive, from teams and sites they have access to, and from their computer. To share a file, users can do the following:

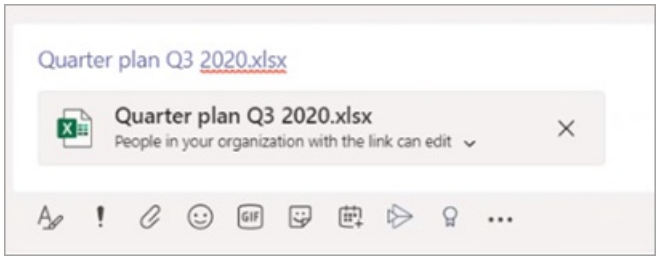
- In a channel, click **Attach** (the paperclip icon), select **Recent**, **Browse Teams and Channels**, **OneDrive**, or **Upload from my computer**, and then choose the file they want to share.



- In a chat, click **Attach** (the paperclip icon), select or **OneDrive** or **Upload from my computer**, and then choose the file they want to share.



- Copy and paste the sharing link in the compose box.



What you need to know about the file sharing experience

Permissions of shared files and sharing links

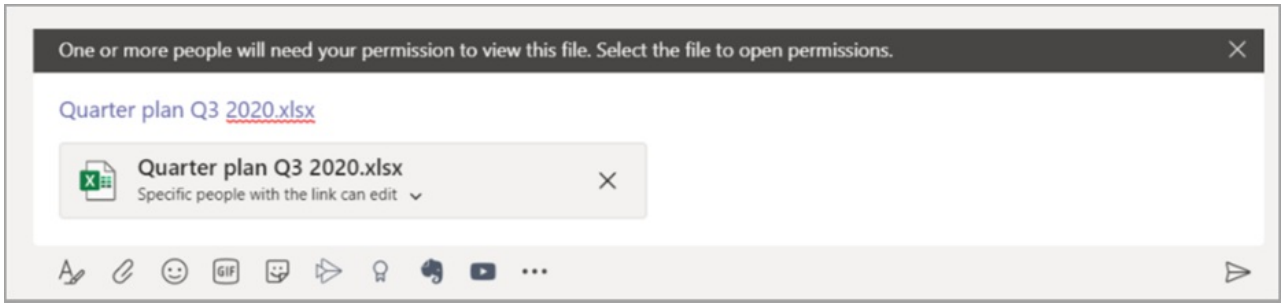
When users share a file by browsing to it in OneDrive or teams and channels, all recipients are granted access along with the default permission that's set at the organization level.

When a user copies and pastes a sharing link, the permissions set on that sharing link are honored and the SharePoint URL is shortened to the file name. In other words, Teams uses just the file name to link to a file.

When users share a file from within Teams, they can set who can access the file just like they do across Microsoft 365. They can give access to anyone, people in your organization, people with existing access, or specific people

(which can include the people in a 1:1 chat, group chat, or channel). When a file is shared, the file preview is available in the message, along with all file actions such as **Open online**, **Download**, and **Copy link**. By default, the file opens in Teams. Sometimes, the sharing link may not have converted to a file preview by the time a user sends the message. The file preview will be generated by the system, but in this scenario, the sharing link won't be shortened to the only the file name.

When users share a file in a chat or channel, they're notified whether some or all recipients don't have permission to view the file. They can change the permissions on the file before they share it by clicking the arrow next to the file preview that now appears in the message.



Copy a sharing link in Teams

Users can copy a SharePoint sharing link and change sharing permissions just like they do across Microsoft 365. They can give access to anyone, people in your organization, people with existing access, or specific people. The default permission of the link is the same as the default permission set at the organization level unless SharePoint site level permissions override it.

Configure sharing in OneDrive and SharePoint

For more information about sharing files in OneDrive and SharePoint, including how to configure sharing and how to turn sharing on and off, see:

- External sharing overview - describes what happens when users share, depending on what they're sharing and with whom.
- Manage sharing settings - describes how global and SharePoint admins can change their organization-level sharing settings for SharePoint and OneDrive.
- Turn external sharing on or off for a site – describes how global and SharePoint admins can turn external sharing on or off for a site.
- Change the default link type for a site - describes how to set the default link type so that it's more restrictive.

More information

- How SharePoint Online and OneDrive for Business interact with Microsoft Teams
- SharePoint and Teams: better together
- Share OneDrive files and folders
- Share SharePoint files or folders

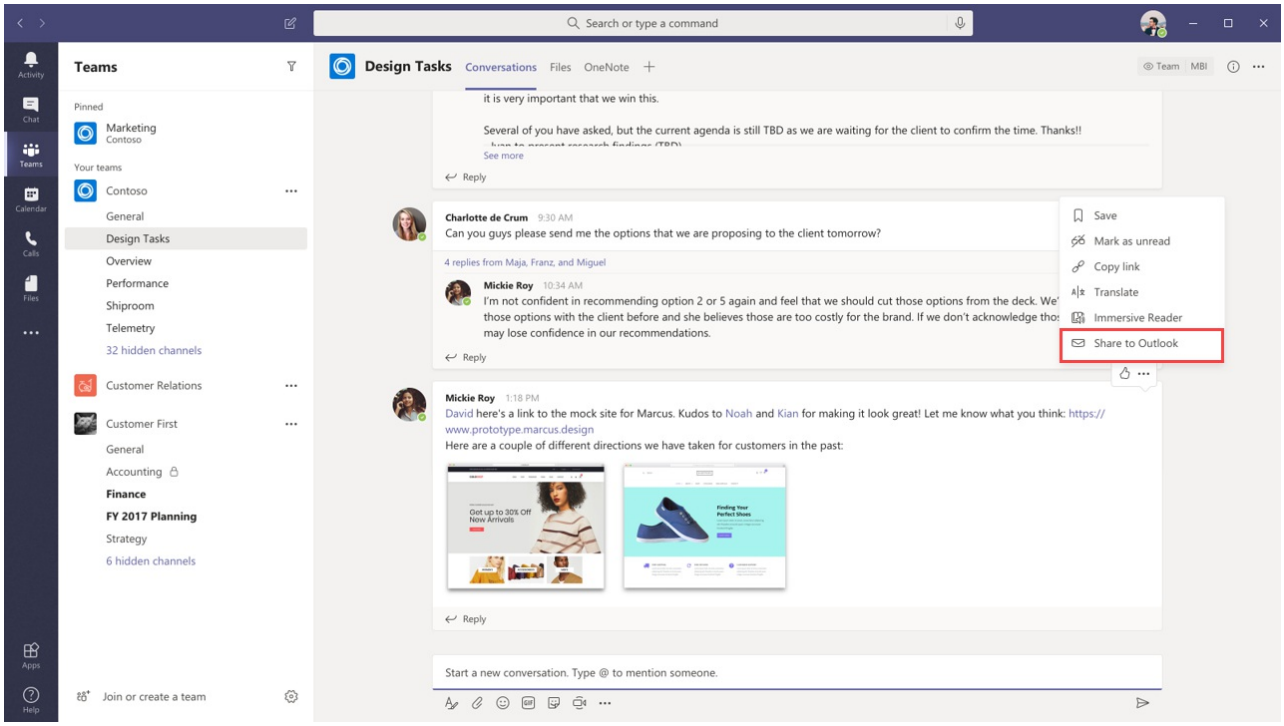
Teams and Outlook email integration

9/10/2020 • 2 minutes to read • Edit Online

Microsoft Teams includes features that make it easy for users in your organization to share information between email in Outlook and chat or channel conversations in Teams and to stay on top of missed conversations. This article gives you an overview of these features and the admin controls that apply.

Share to Outlook

Share to Outlook lets users share a copy of a Teams conversation to an email in Outlook, without having to leave Teams. This feature is handy if users need to share conversations or status updates with users outside their immediate team or even your organization. Go to the top of the conversation in Teams, select **úúú More options**, and then select **Share to Outlook**. To learn more, see Share to Outlook from Teams.

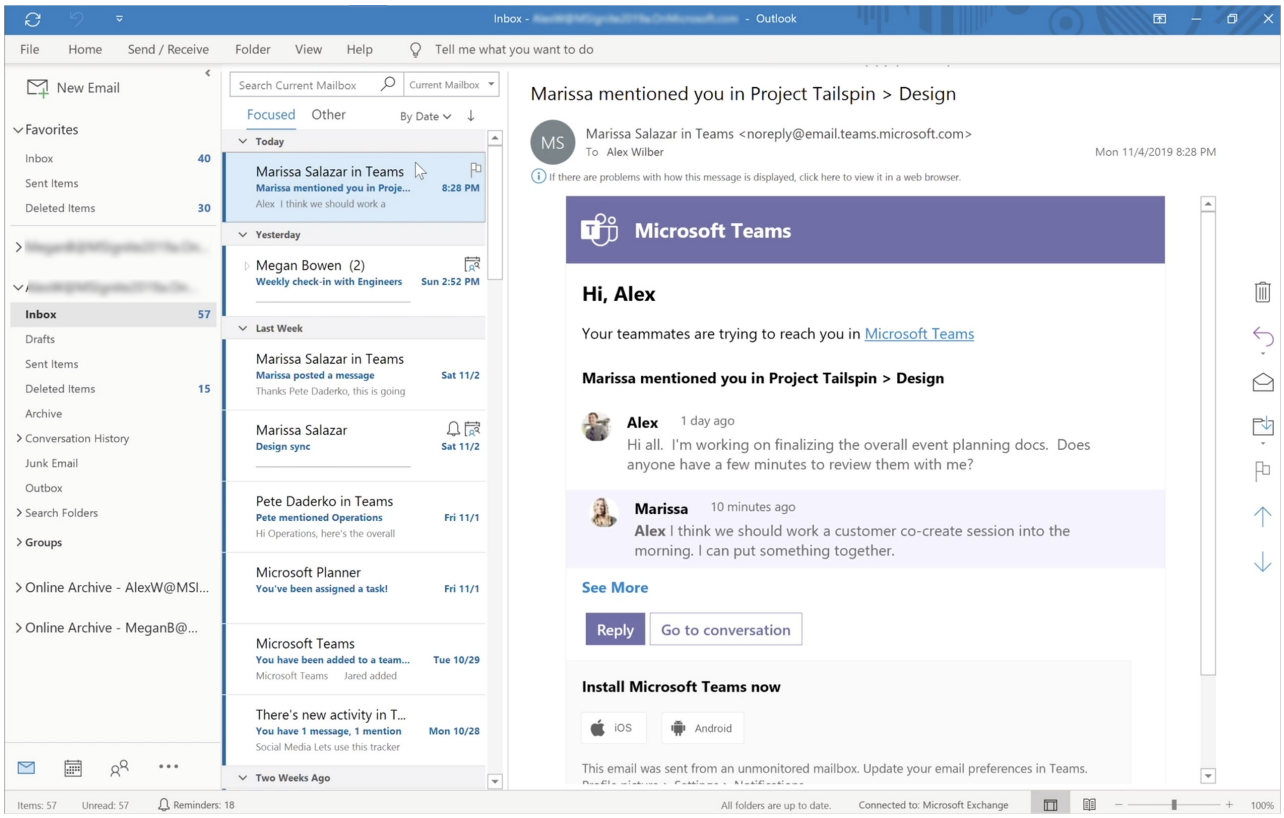


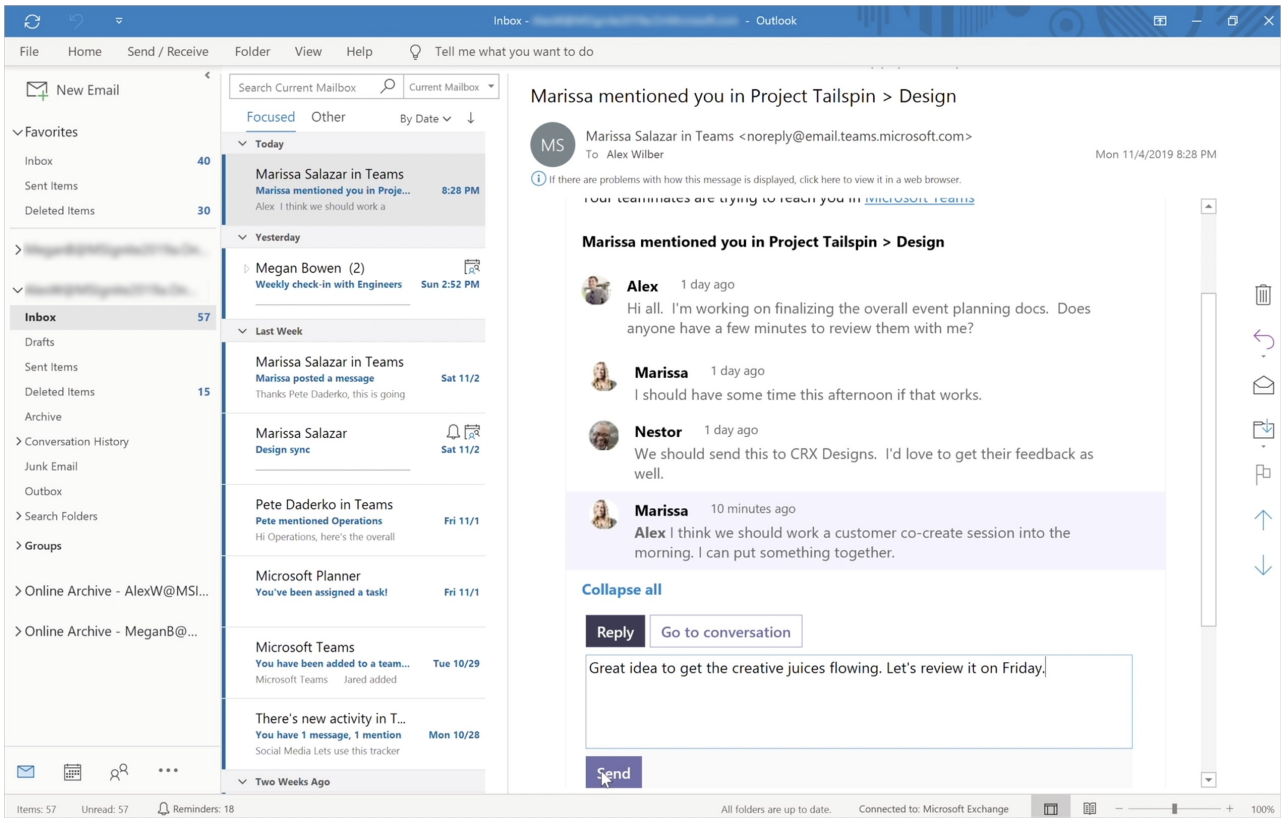
To use this feature, Outlook on the web must be turned on for the user. If Outlook on the web is turned off, the **Share to Outlook** option isn't displayed in Teams for the user. For steps on how to turn on and turn off Outlook on the web, see Enable or disable Outlook on the web for a mailbox.

Actionable activity emails

Users automatically get actionable missed activity emails which help them to catch up on missed conversations in Teams. The missed activity emails show the latest replies from a conversation, including messages that were sent after the missed message, and users can click **Reply** to respond directly from within Outlook. To learn more, see Reply to missed activity emails from Outlook.

> **NOTE**
>
> This feature isn't supported in Outlook for Mac or some older versions of Outlook for Windows. For more information, see Actionable messages in Outlook and Office 365 Groups.





You can use the Set-OrganizationConfig cmdlet together with the **SmtpActionableMessagesEnabled** parameter to turn off actionable emails. By default, the **SmtpActionableMessagesEnabled** parameter is set to **true**. Setting the parameter to **false** turns off actionable email messages across Office 365. For Teams users, this means that the **Reply** option to respond directly in Outlook isn't available in missed activity emails. Instead, the missed activity emails include a **Reply in Teams** option for users to reply in Teams.

Manage messaging policies in Teams

8/19/2020 • 5 minutes to read • Edit Online

Messaging policies are used to control which chat and channel messaging features are available to users (owners and members) in Microsoft Teams. You can use the global (Org-wide default) policy that's created automatically or create and assign custom messaging policies.

Users in your organization will automatically get the global policy unless you create and assign a custom policy. You can edit the settings in the global policy or create and assign one or more custom policies to turn on or turn off the features that you want.

Create a custom messaging policy

1. In the left navigation of the Microsoft Teams admin center, go to **Messaging policies**.
2. Click **Add**.
3. Enter a name and description for the policy.
4. Choose the settings that you want.
5. Click **Save**.

For example, say you want to make sure that sent messages aren't deleted or altered. Create a new custom policy named "Retain sent messages" and turn off the following settings:

- Owners can delete sent messages
- Users can delete sent messages
- Users can edit sent messages

Then assign the policy to users.

Edit a messaging policy

You can edit the global policy and any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Messaging policies**.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. From here, make the changes that you want.
4. Click **Save**.

Assign a custom messaging policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

A user can only be assigned one messaging policy at a time.

> **NOTE**
> You can't delete a policy if users are assigned to it. You must first assign a different policy to all affected users, and then you can delete the original policy.

Messaging policy settings

Here are the messaging policy settings that you can configure.

- **Owners can delete sent messages** Use this setting to let owners delete messages that users sent in chat.
- **Users can delete sent messages** Use this setting to let users delete messages that they sent in chat.
- **Users can edit sent messages** Use this setting to let users edit the messages that they sent in chat.
- **Read receipts** Read receipts allow the sender of a chat message to be notified when their message was read by the recipient in 1:1 and group chats 20 people or less. Message read receipts remove uncertainly about whether a message was read, and improve team communication. Please note that read receipts are not captured in eDiscovery reporting.
  - **User controlled** This means that users get to decide if they want read receipts ON or OFF. Default setting within the app is ON. Users can then turn it OFF.
  - **On for everyone** This means everyone in the tenant will have the feature ON with no option to turn it off. Be aware that when using the **On for everyone** setting, the only way to set receipts for the whole tenant is either to have only one messaging policy for the whole tenant (the default policy named "Global (Org-wide Default)") or to have all messaging policies in the tenant use the same settings for receipts. The read receipts feature is most effective when the feature is enabled to **On for everyone**.
  - **Off for everyone** This means the feature is disabled and no one in the tenant has read receipts nor can they turn it on.
- **Chat** Turn this setting on if you want users in your organization to be able to use the Teams app to chat with other people.
- **Use Giphys in conversations** If you turn this on, users can include Giphys in chat conversations with other people. Giphy is an online database and search engine that allows users to search for and share animated GIF files. Each Giphy is assigned a content rating.
- **Giphy content rating**
  - **No restriction** This means that your users will be able to insert any Giphy in chats regardless of the content rating.
  - **Moderate** This means that your users will be able to insert Giphys in chats, but will be moderately restricted from adult content.
  - **Strict** This means that your users will be able to insert Giphys in chats, but will be strictly restricted from adult content.
- **Use Memes in conversations** If you turn this on, users can include Memes in chat conversations with other people.
- **Use Stickers in conversations** If you turn this on, users can include Stickers in chat conversations with other people.
- **Allow URL previews** Use this setting to turn automatic URL previewing on or off in messages.
- **Allow users to translate messages** Turn this setting on to let users automatically translate Teams messages into the language specified by their personal language settings for Microsoft 365 or Office 365.
- **Allow immersive reader for viewing messages** Turn this setting on to let users view messages in Microsoft Immersive Reader. Immersive Reader is a learning tool that provides a full screen reading experience to increase readability of text.
- **Send urgent messages using priority notifications** If you turn this on, users can send messages using priority notifications. Priority notifications notify users every 2 minutes for a period of 20 minutes or until

messages that are marked as *urgent* are picked up and read by the recipient, maximizing the likelihood that the message is acted upon in a timely manner.

- Audio message creation

  > **IMPORTANT**
  > Audio messages are not captured in eDiscovery reporting.

  - **Allowed in chats and channels** This means that users can leave audio messages in both chats and channels.
  - **Allowed in chats only** This means that users can leave audio messages in chats, but not in channels.
  - **Disabled** This means that users cannot create audio messages in chats or channels.
- **On mobile devices, display favorite channels above recent chats** Enable this setting to move favorite channels to the top of the mobile device screen so that a user doesn't need to scroll to find them.
- **Allow a user to remove users from a group chat** Turn this setting on to let a user remove other users from a group chat. This feature lets you continue a chat with a smaller group of people without losing the chat history.
- **Enable suggested replies** Turn this setting on to enable suggested replies for chat messages.

> **NOTE**
> Some of these settings, such using Giphys, can also be configured at the team level by team owners and at the private channel level by private channel owners.

Related topics

- Assign policies to your users in Teams
- Assign team owners and members in Microsoft Teams

User presence in Teams

12/5/2020 • 4 minutes to read • Edit Online

Presence is part of a user's profile in Microsoft Teams (and throughout Microsoft 365 or Office 365). Presence indicates the user's current availability and status to other users. By default, anyone in your organization using Teams can see (in nearly real time) if other users are available online. Presence is updated in real time on the web and desktop versions when you refresh the page on mobile.

> **NOTE**
> For details about Teams user profiles on different platforms, see Teams features by platform.

Presence states in Teams

USER CONFIGURED	APP CONFIGURED	
Available	Available	
	Available, Out of Office. Note: Out of office is automatically set for the periods of time where the user sets "automatic replies". If the user is using the app during these periods of time, a dual presence might be shown, such as "Out of office, available".	
Busy	Busy	
	In a call	
	In a meeting	
	On a call, out of office	
Do not disturb		
	Presenting	
	Focusing. Focus happens when the users schedule focus time in MyAnalytics/Insights in their calendars.	
Away	Away	
	Away Last Seen *time*	
Be right back		

USER CONFIGURED	APP CONFIGURED	
Appear offline	Offline. When users aren't logged in on any of their devices for a few minutes, they appear offline.	
	Status unknown	
	Out of Office. Out of Office is used when an automatic reply is set. (Available in Outlook only.)	

App-configured presence states are based on user activity (Available, Away), Outlook calendar states (In a meeting), or Teams app states (In a call, Presenting). When you're in focus mode based on your calendar, **Focusing** will be the state people see in Teams. Focus mode will display as **Do not disturb** in other products.

Your current presence state changes to Away when you lock your computer or when your computer enters idle or sleep mode. On a mobile device, your presence status changes to Away whenever the Teams app is in the background.

Users receive all chat messages sent to them in Teams regardless of their presence state. If a user is offline when someone sends them a message, the chat message appears in Teams the next time the user is online. If a user state is set to Do not disturb, the user will still receive chat messages, but banner notifications aren't displayed.

Users receive calls in all presence states except for Do not disturb, in which incoming calls go to voicemail. If the recipient blocked the caller, the call won't be delivered and the caller sees the recipient's presence as Offline.

Users can add people to their priority access list by going to **Settings** > **Privacy** in Teams. People who have priority access can contact the user even when the user's status is set to Do not disturb.

Dual presence

The way presence works for most users is motivated by the events in the calendar or device events, such as a call. The user can override this status in the UI by manually setting states, which have some expiration time.

User configured states expiration

When a user selects a specific presence state, it takes precedence over any app activity update. For example, if a user sets herself as Do not disturb, her presence will remain as Do not disturb even if she attends a meeting or answers a call.

User configured states have default expiration settings in Teams, in order to prevent users from displaying a status that may not be relevant after a period of time.

USER CONFIGURED STATE	DEFAULT EXPIRATION
Busy	1 day
Do not disturb	1 day
Others	7 days

> **NOTE**
> A user can also configure manually a duration for her presence. For instance, a user can set herself as Appear offline until tomorrow morning.

Admin settings in Teams compared to Skype for Business

The following admin settings Skype for Business are different in Teams:

- In Teams, presence sharing is always enabled for users in the organization. Privacy (where you define who can see presence) configuration isn't available in Teams.
- Presence sharing with everyone (including Federated services) is always enabled for users in Teams. Their contact list (if they had one in Skype for Business) is visible under **Chat** > **Contacts** or under **Calls** > **Contacts**.
- Client Do Not Disturb and Breakthrough features are always enabled for users in Teams.
- Calendar (includes out of office and other calendar information) integration is always enabled for users when Teams is integrated with Outlook.
- The *Last seen* or *Away since* indicator is always enabled for users in Teams if the organization also uses Skype for Business.

> **NOTE**
> The ability of a Teams admin to customize these settings is not currently supported.

Admin settings in Teams compared to Microsoft Outlook

Teams presence in Outlook is supported on the Outlook 2013 desktop app and later.

If the upgrade mode policy of the user account is set to TeamsOnly, Outlook talks to Teams to get presence. If the user account isn't set to TeamsOnly, then Outlook talks to Skype for Business.

Coexistence with Skype for Business

See Coexistence with Skype for Business for details on how Teams presence functions when your organization also uses Skype for Business.

Manage tags in Microsoft Teams

12/5/2020 • 5 minutes to read • Edit Online

> **NOTE**
> One of the features discussed in this article, **tagging by shift**, hasn't yet been released. It's been announced, and it's coming soon. If you're an admin, you can find out when this feature will be released in the Message Center (in the Microsoft 365 admin center). To stay on top of upcoming Teams features, check out the Microsoft 365 Roadmap.

Overview

Tags in Microsoft Teams let users quickly and easily connect with a subset of people on a team. You can create and assign custom tags to categorize people based on attributes, such as role, project, skill, or location. Or, tags can be automatically assigned to people based on their schedule and shift information in the Shifts app (coming soon). After a tag is added to one or multiple team members, it can be used in @mentions by anyone on the team in a channel post or to start a conversation with only those people who are assigned that tag.

As mentioned earlier, there are two kinds of tags in Teams.

- **Custom tags**: Team owners and team members (if the feature is enabled for them) can manually create and assign tags to people. For example, a "Designer" or "Radiologist" tag will reach those sets of people on a team without having to type their names.
- **Tagging by shift** (coming soon): With this feature, people are automatically assigned tags that match their schedule and shift group name in the Shifts app in Teams. For example, the "EngineerOnCall" tag reaches all engineers who are scheduled in Shifts to work at the time the tag is used in a chat or channel post. With tagging by shift, Teams takes the guesswork out of knowing the name of on-shift staff when users need to quickly relay information. Tagging by shift can also be backed by major workforce management systems like JDA, Kronos, and AMiON by integrating them with Shifts in Teams. To learn more about how to set up this feature, see Set up tagging by shift.

> **NOTE**
> Tags are not yet supported in private channels. Tags are not yet available in US Government Community Cloud (GCC), GCC High, or Department of Defense (DoD) organizations.

How tags work

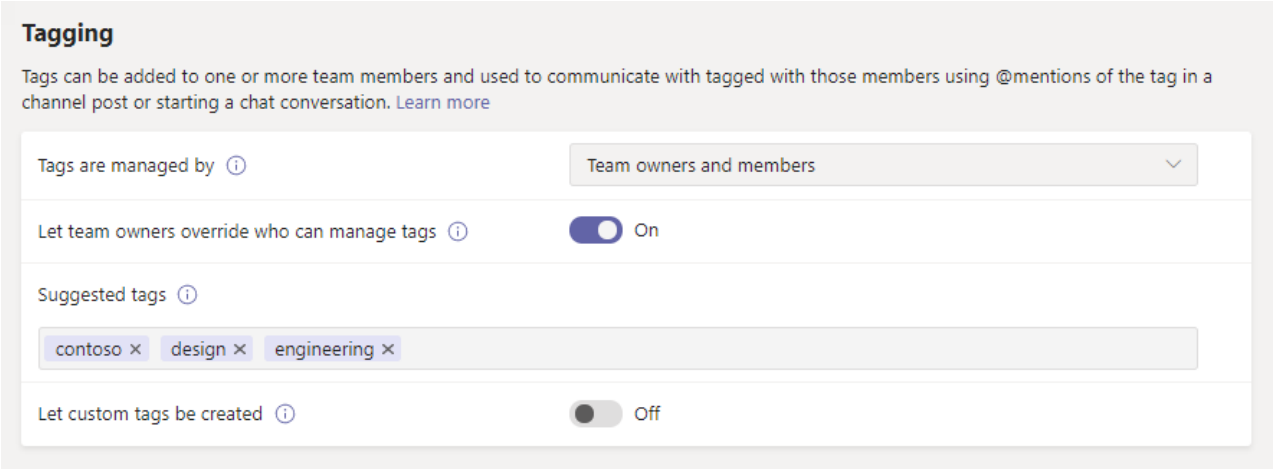
A tag can be manually added or automatically assigned to a person on a specific team. It can then be used in @mentions on the **To** line in a chat or in a post on any standard channel of the team. Here's some examples of how tags can be used in Teams:

- A store manager posts an announcement to a channel to notify all cashiers.
- A hospital administrator sends a message to all radiologists in a channel.
- A marketing manager starts a group chat with all designers.
- A nurse sends a message to all on-call cardiologists. (coming soon)
- A system engineer posts an announcement to a channel to notify all on-shift field engineers. (coming soon)

When a tag is @mentioned in a channel conversation, team members associated with the tag will get notified, just like any other @mention.

Manage custom tags for your organization

As an admin, you can control how tags are used across your organization in the Microsoft Teams admin center. Currently, you can't use PowerShell to manage tags.



A team can have up to 100 tags, up to 100 team members can be assigned to a tag, and up to 25 tags can be assigned to a single user.

Set who can add custom tags

By default, team owners can add custom tags. You can change this setting to allow team owners and team members to create, edit, delete, and manage tags or you can turn off tags for your organization.

1. In the left navigation of the Microsoft Teams admin center, click **Org-wide settings** > **Teams settings**.
2. Under **Tagging**, next to **Tags are managed by**, select one of the following options:
   - **Team owners and members**: Allow team owners and members to manage tags.
   - **Team owners**: Allow team owners to manage tags.
   - **Disabled**: Turn off tags.

Configure custom tags settings

You can configure the following tags settings to control how custom tags are used across your organization.

1. In the left navigation of the Microsoft Teams admin center, click **Org-wide settings** > **Teams settings**.
2. Under **Tagging**, set the following, depending on the needs of your organization.
   - **Let team owners override who can manage tags**: When you turn on this setting, team owners can set whether team members can create and manage tags within a team and the value of the **Tags are managed by** setting is the default value for each team. If you turn off this setting, the **Tags are managed by** setting can't be changed per team.
   - **Suggested default tags**: Use this to add a set of default tags. You can add up to 25 tags, and each tag can contain a maximum of 25 characters. Team owners and members (if the feature is enabled for them) can use these suggestions, add to them, or create a new set of tags.
   - **Let custom tags be created**: Turn on this setting to let people add tags other than the suggested default tags that you set. If this is turned off, people can only use the suggested default tags. If you turn this off, make sure that you add one or more default tags.

Manage custom tags settings for a team

If you turned on the **Let team owners override who can manage tags** setting in the Microsoft Teams admin center, team owners can set whether members can add tags at the team level. To do this, on the **Settings** tab for a team, go to **Tags**, and then choose who can add tags.

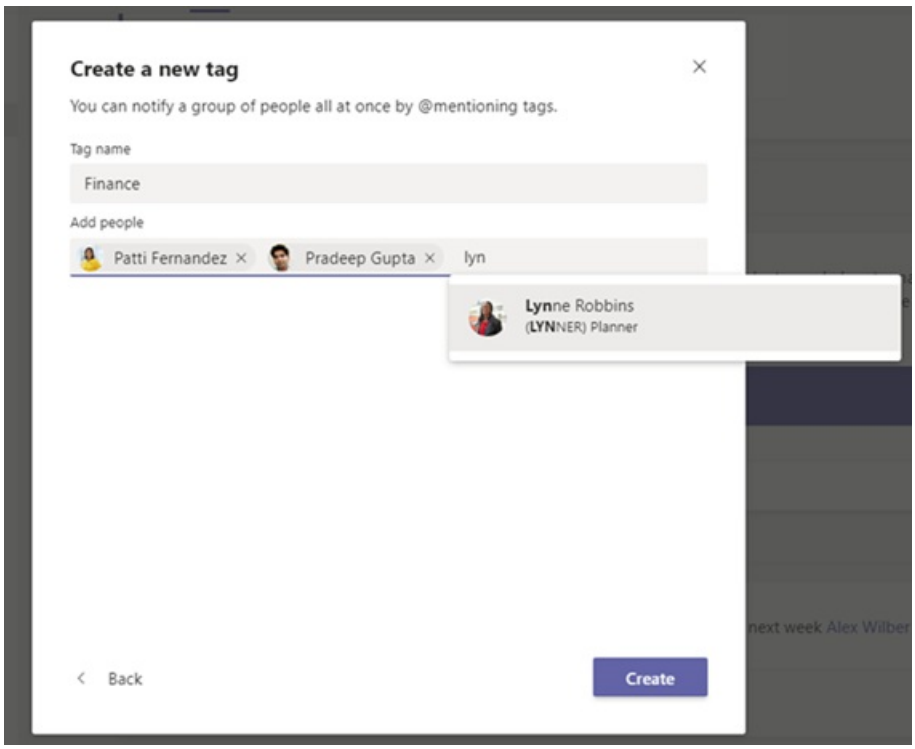


Use tags

Here's how to add custom tags and how to set up tagging by shift (if you're using the Shifts app in Teams). To learn more, check out Using tags in Teams.

Create and assign custom tags

To create and assign custom tags, select **Teams** on the left side of the app, and then find your team in the list. Select **úúú More options**, and then choose **Manage tags**. Here, you can create tags and assign them to people on your team.



To delete a tag, select **úúú More options** next to the tag, and then select **Delete tag**.

Set up tagging by shift (coming soon)

1. In Teams, go to the Shifts app.
2. Create shift groups and name them after an attribute such as a role. For example, EngineerOnCall. The shift group name will be the name of the tag.
3. Fill out a schedule by assigning shifts to members of you teams. When you're finished, in the upper-right corner of the Shifts app, select **Share with team**.
4. Wait 15 minutes for the scheduled shifts to populate the tagging service.
5. Use the tag anywhere you use tags in Teams.

Tagging by shift allows your users to reach the people on-shift in real time. Notifications are sent only to those people who are on shift at the time a tag is used to start a chat or in a channel post.

Related topics

Using tags in Teams

Manage the Shifts app for your organization in Teams

Shifts Help documentation

View analytics in Teams

4/29/2020 • 3 minutes to read • Edit Online

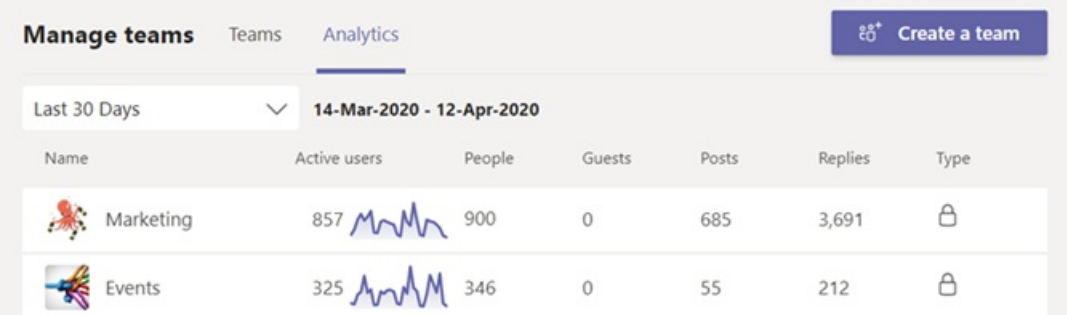
In Microsoft Teams, users can view analytics for teams and channels that they are part of. This information gives users insight into usage patterns and activity on their teams. Users can see data such as the number of active users, posts, replies, and more at three levels.

- **Cross-team analytics** gives users a broad overview of usage data for all teams that they are a member or owner of in a single list view.
- **Per-team analytics** gives users a more granular view, showing usage data for a specific team.
- **Per-channel analytics** gives users an even more granular view, showing usage data for a specific channel.

Users can filter any of these views to see data for a specified time period.

View cross-team analytics

1. In Teams, at the bottom of the teams list, next to **Join or create a team**, click **Manage teams**.
2. Click the **Analytics** tab.
3. Select a date range to show usage data for all teams that you're a member or owner of.



ITEM	DESCRIPTION
Name	Name of the team.
Active users	Number of active users on the team and trend line of team activity during the specified time period.
People	Total number of people on the team in the specified time period. This includes team owners, team members, and guests.
Guests	Number of guests on the team during the specified time period.
Posts	Number of new messages posted in team chat during the specified time period.
Replies	Number of replies in team chat during the specified time period.

ITEM	DESCRIPTION
Type	Whether the team is a private team or public team.

View per-team analytics

1. In Teams, go to the team that you want, click **More options (...)**, and then click **Manage team**.
2. Click the **Analytics** tab.
3. Select a date range to show usage data for the team.

S

Sales ···

Team

Members Channels Analytics Apps 1 more

All Channels | Last 90 Days | 14-Jan-2020 - 12-Apr-2020

Summary

601	720	3,151	19	4
Users	Posts	Replies	Apps	Meetings

Active users



601 Active users

0 Inactive users

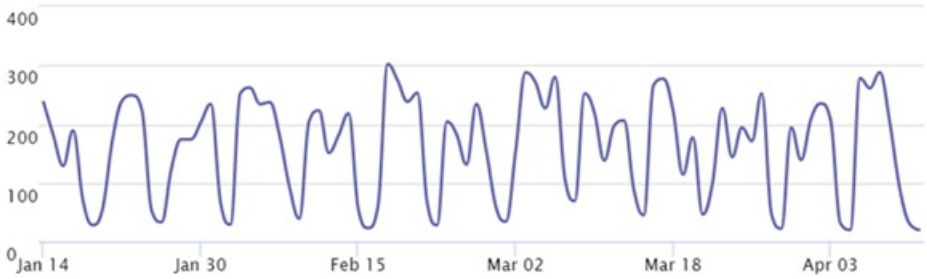
Role



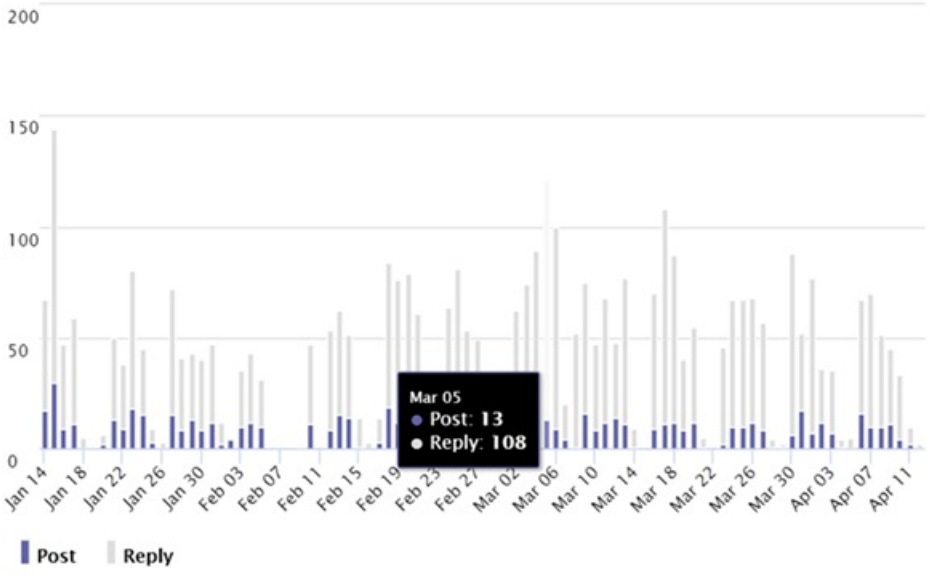
601 Owners + Members

0 Guests

Active users



Messages



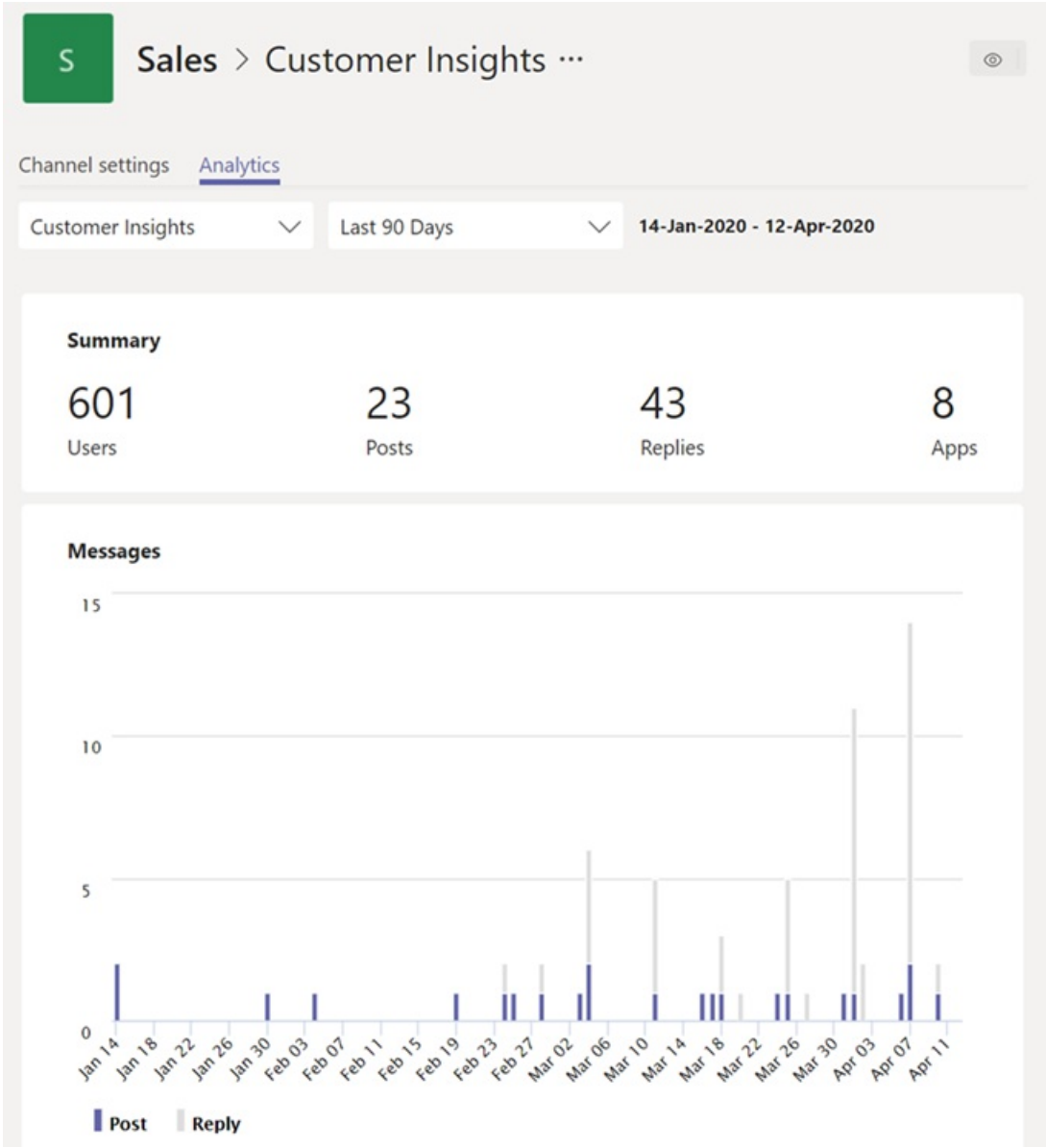
ITEM	DESCRIPTION
Summary	Summary of team activity including the following: • **Users**: Total number of users in the specified time period. This includes team owners, team members, and guests. • **Posts**: Number of new messages posted in team chat during the specified time period. • **Replies**: Number of replies in team chat during the specified time period. • **Apps**: Number of apps added to the team. • **Meetings**: Number of Teams meetings organized at the team level.
Active users	Number of active and inactive users.
Role	Numbers of users by role, including team owners, team members, and guests.
Active users chart	Number of daily active. Hover over the dot on a given date to see the number of active users on that date.
Messages chart	Total number of messages posted in team chat by date. Hover over the dot on a given date to see the number of new posts and replies posted on that date.

TIP

You can also view per-team analytics by clicking a team in list in the cross-team analytics view.

View per-channel analytics

1. In Teams, go to the channel that you want, click **More options (...)**, and then click **Manage channel**.
2. Click the **Analytics** tab.
3. Select a date range to show usage data for the channel.



ITEM	DESCRIPTION
Summary	Summary of channel activity including the following: • **Users**: Total number of users in the specified time period. This includes team owners, team members, and guests. • **Posts**: Number of new messages posted to the channel during the specified time period. • **Replies**: Number of replies in the channel during the specified time period. • **Apps**: Number of apps added to the channel.
Messages chart	Total number of messages posted to the channel chat by date. Hover over the dot on a given date to see the number of new posts and replies posted on that date.

TIP

You can also view per-channel analytics by selecting a channel in the drop-down list box in the per-team analytics view.

NOTE

We define active users as users who perform an intentional action in the desktop client, mobile client, and web client. Examples of an intentional action include starting a chat, placing a call, sharing a file, editing a document within teams, participating in a meeting, and so on. We strip out passive actions like auto boot, minimizing a screen, or closing the app. We also de-dupe all actions across a single user ID.

Related topics

- View analytics for your teams
- Teams analytics and reporting

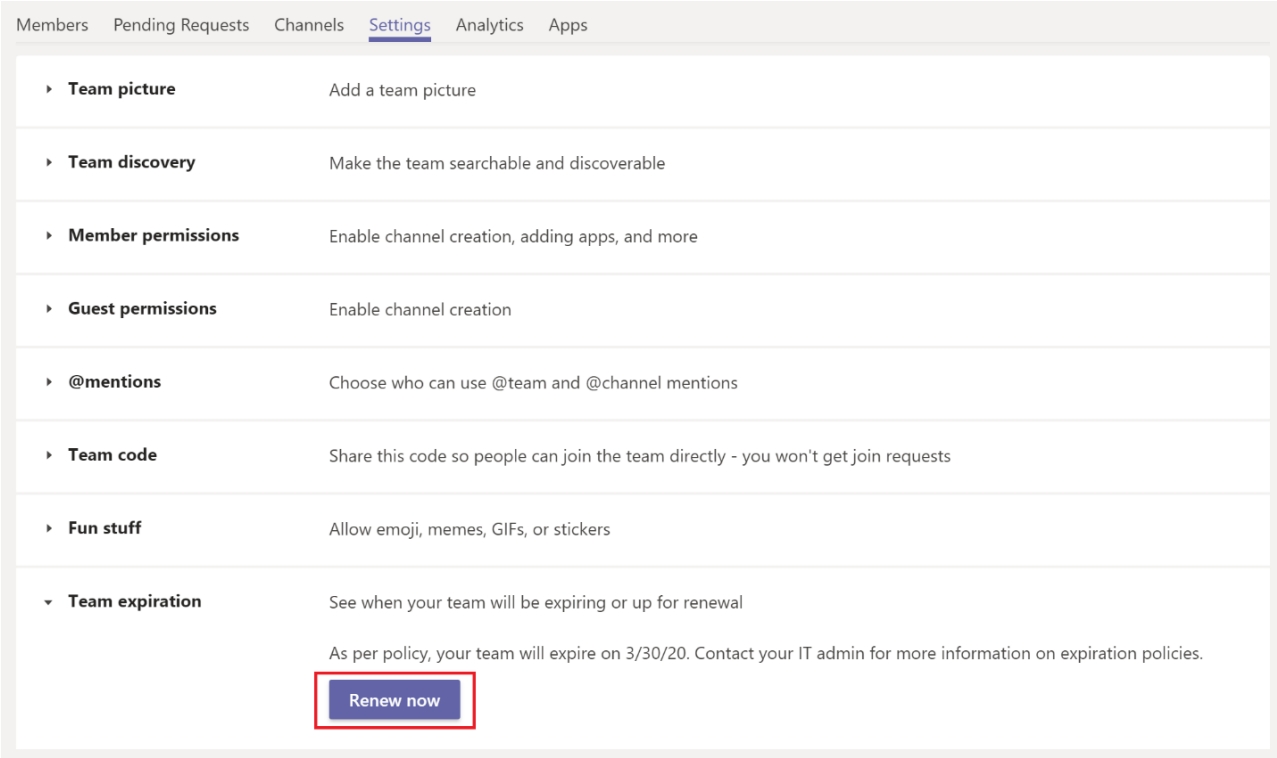
Team expiration and renewal in Microsoft Teams

8/12/2020 • 2 minutes to read • Edit Online

Organizations with a large number of teams often have teams that are never actually used. This can happen because of several reasons including product experimentation, short-term team collaboration, or team owners leaving the organization. Over time, such teams can accumulate and create a burden on tenant resources.

To curb the number of unused teams, as an admin, you can use Microsoft 365 group expiration policy to automatically clean up unused teams. Because teams are backed by groups, group expiration policies automatically apply to teams as well.

When you apply an expiration policy to a team, a team owner receives a notification for team renewal 30 days, 15 days and 1 day before the team's expiration date. When the team owner receives the notification, they can click **Renew now** in team settings to renew the team.



If the team owner doesn't renew the team and there is no further activity on the team until the end of the expiration policy, the team is put in a "soft-deleted" state, which means it can be restored within the next 30 days.

Team auto-renewal

There can be times when a team owner is unable to renew the team perhaps because they forgot to renew or were away when renewal was due. In these scenarios, a team in active use can get deleted because of expiration policies that apply to the team.

To prevent accidental deletion, auto-renewal is automatically enabled for a team in the group expiration policy. When the group expiration policy is set up, any team that has at least one channel visit from any team member before its expiration date is automatically renewed without any manual intervention from the team owner.

Known issues

Expiration date of team and underlying group don't match

Before a team is renewed, the group that backs the team is renewed first. As part of renewal, a new expiry date is set on the group for a future date. This new date may not be immediately visible in Teams. It can take up to 24 hours to sync. If you see a discrepancy between the expiry date for a team and its underlying group, wait 24 hours before seeking further support.

Archive or delete a team in Microsoft Teams

8/6/2020 • 3 minutes to read • Edit Online

Over time, a team created in Microsoft Teams might fall out of use or you might want to archive or delete a team at the end of a project. If you're a Microsoft Teams admin, follow the steps in this article to archive or delete a team that's no longer needed.

When you archive a team, all activity for that team ceases. Archiving a team also archives private channels in the team and their associated site collections. However, you can still add or remove members and update roles and you can still view all the team activity in standard and private channels, files, and chats.

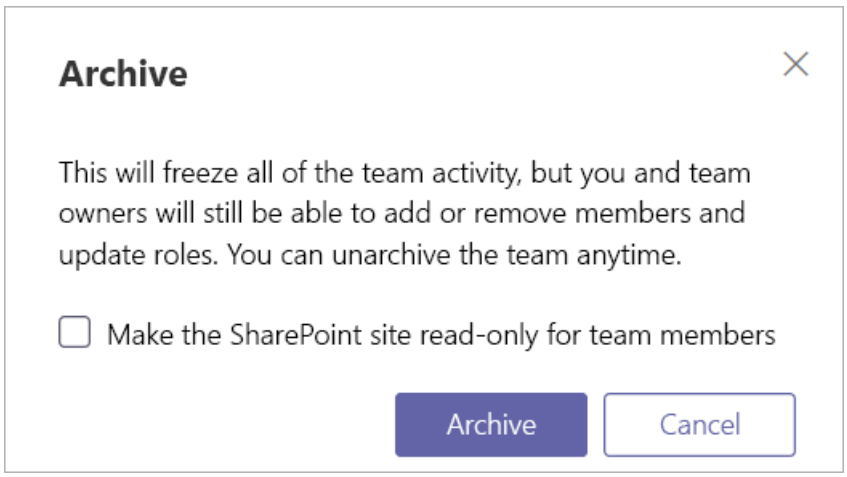
When you delete a team, team activity in standard and private channels (and associated site collections), files, and chats is also deleted.

> **IMPORTANT**
> Archived teams can be reactivated, but you can't directly restore a team that has been deleted. Consider archiving the team first, and postpone the deletion until you're sure that you no longer need the team.

Archive a team

Follow these steps to archive a team. You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

1. In the admin center, select **Teams**.
2. Select a team by clicking the team name.
3. Select **Archive**. The following message will appear.



4. To prevent people from editing the content in the SharePoint site and Wiki tab associated with the team, select **Make the SharePoint site read-only for team members**. (Teams owners will still be able to edit this content.)
5. Select **Archive** to archive the team. The team's status will change to **Archived**.

Make an archived team active

Follow these steps to make an archived team active again.

1. In the admin center, select **Teams**.
2. Select a team by clicking the team name.
3. Select **Unarchive**. The team's status will change to **Active**.

Delete a team

If the team will not be required in the future, then you can delete it rather than archiving it. Follow these steps to delete a team.

1. In the admin center, select **Teams**.
2. Select a team by clicking the team name.
3. Select **Delete**. A confirmation message will appear.
4. Select **Delete** to permanently delete the team.

Restore a deleted team

Follow these steps to restore a deleted team by restoring the Microsoft 365 group that's associated with the team. Restoring the Microsoft 365 group for a team restores team content, including tabs, standard channels, and private channels and their associated site collections.

By default, a deleted Microsoft 365 group is retained for 30 days. This 30-day period is called "soft-delete" because you can restore the group. To learn more, see Restore a deleted Group.

Install the AzureADPreview module

1. Open Windows PowerShell as an admin.
2. If you have an earlier version of the AzureADPreview module installed or the AzureAD module installed, uninstall it by running one of the following:

```
Uninstall-Module AzureADPreview
```

```
Uninstall-Module AzureAD
```

3. Install the latest version of the AzureADPreview module by running the following:

```
Install-Module AzureADPreview
```

Restore the deleted Microsoft 365 group

1. Connect to Azure AD by running the following:

```
Connect-AzureAD
```

   When you're prompted, sign in using your admin account and password.

2. Run the following to display a list of all soft-deleted Microsoft 365 groups that are still within the 30-day retention period. Use the **-All $True** parameter if you have a lot of groups.

```
Get-AzureADMSDeletedGroup
```

3. Find the group that you want to restore, and then make a note of the Id.

4. Run the following to restore the group, where [Id] is the group Id.

```
Restore-AzureADMSDeletedDirectoryObject -Id [Id]
```

5. Run the following to verify the group was successfully restored, where [Id] is the group Id.

```
Get-AzureADGroup -ObjectId [Id]
```

   It can take up to 24 hours for the restore process to complete, after which the team and content associated with the team, including tabs and channels, is displayed in Teams.

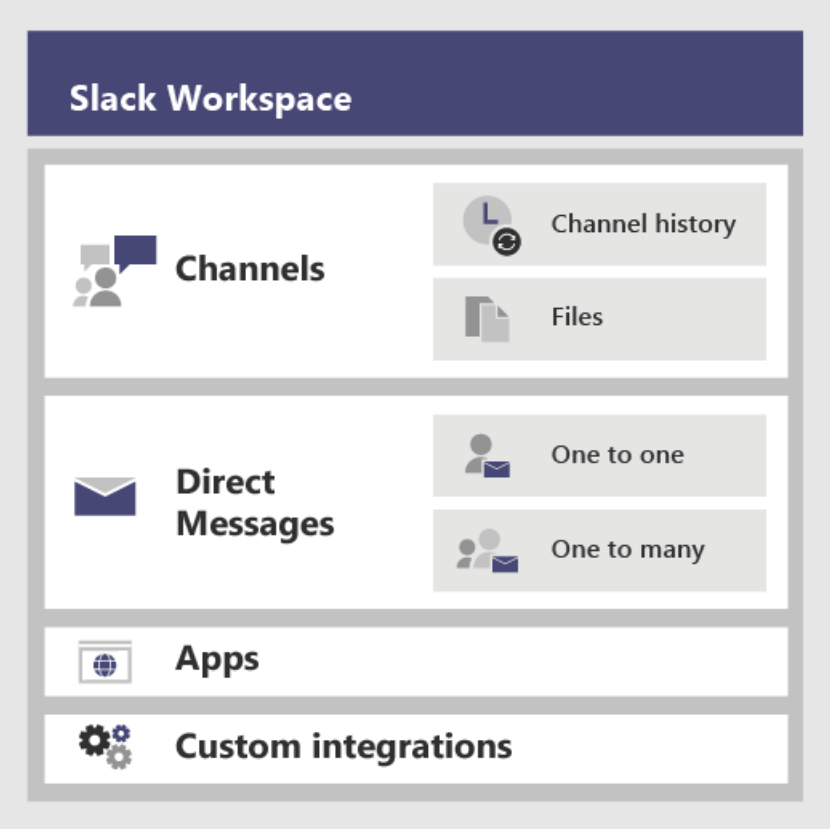
Migrate from Slack to Microsoft Teams

12/5/2020 • 13 minutes to read • Edit Online

This article walks you through the journey of moving to Microsoft Teams from Slack.

When planning your organization's move to Teams from Slack, it's important to decide what you need to keep (if anything). We'll start off by describing what types of data can be migrated and then walk you through how to assess your needs, plan your move, and then make the move.

The diagram below shows the Slack architecture at a high level.



Plan your migration from Slack

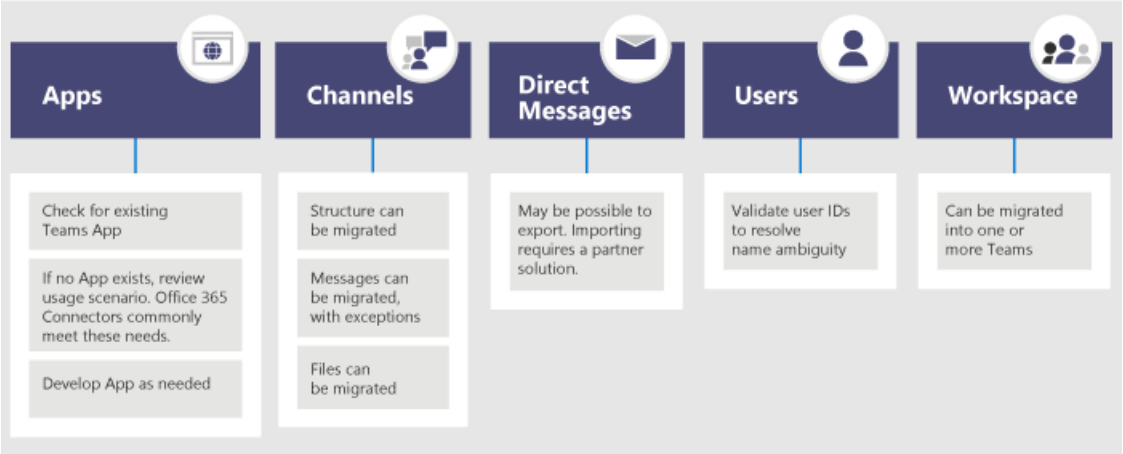
What you can and can't migrate

Your Slack service plan will determine what you can and can't migrate. For example, some Slack service plans only let you export public channels history and files, other require a DocuSign request to include Private Channels and Direct Messages.

To determine your Slack Workspace service level, log into Slack and note your plan type on the **About this Workspace** page.

To learn more about Slack export options, go to the Slack website: https://get.slack.help/hc/articles/204897248-Guide-to-Slack-import-and-export-tools

The diagram below gives you a high-level look at the Slack migration landscape that we'll cover in this article.



When you're done with this section, you should understand:

- The service level of your Slack Workspaces
- What can and can't be exported
- Common approaches to exporting

Assess your Slack workspaces

Before you can plan your organization's migration plan, you need to pull together some information about your Slack workspaces. Understanding how your Slack workspaces are being used helps you determine the scope of your migration. For example, how many workspaces are being moved? Are they used by a specific department, many, or in use by an entire organization?

If you're a member of the Slack Workspaces you want to migrate, you can analyze the usage yourself by going to *.slack.com/stats*. Review the Channels and Members tabs to look for usage patterns. Decide which workspaces you want to migrate (and which ones you want to leave behind).

> **NOTE**
> If you don't have access to the stats page, you're not an admin or owner.

Export Channels

In Slack, users join a channel which is part of a Slack Workspace, whereas in Teams users join a team which is a collection of channels. We recommend that you use Slack analytics to see how much activity happens in each channel to help you decide which channels to move. You'll use the resulting list to figure out how to group your Slack channels into teams in Teams as well as who should be members of each team.

If you have a paid Slack service plan (anything other than Free), you can use Slack's analytics (.slack.com/admin/stats#channels) to see how active a channel is, when it was last used, and how many people are members. This can help you decide whether to migrate the channel. By default, public channels content (messages and files) can be exported. Depending on your Slack service plan and whether you've requested Private Channels and Direct Messages from Slack, those can be exported.

To learn more about Slack export options, go to the Slack website: https://get.slack.help/hc/articles/204897248-Guide-to-Slack-import-and-export-tools

> **IMPORTANT**
> Check your organization's privacy and compliance requirements around channel data. Your organization may have compliance requirements around the handling, storage, and processing of this data, in addition to complying with the lifecycle of end-user identifiable content (EUII).

Export Direct Messages

Direct Messages are the same as chats in Teams, which are 1:1 or 1-to-many non-channel conversations. Export-ability depends on your Slack service plan and if you've requested Direct Messages to be included in your Slack Export. Teams doesn't support importing Direct messages currently. Consult a Microsoft partner to learn about third-party solutions you can explore that bring Direct Messages content into Teams.

For exporting Direct Messages, check out tools, such as Export, in the Slack App Store.

Apps and custom integrations

Apps in Slack are like apps in Teams. Once you have a list of apps and their configurations in the Workspace, you can search in the Teams App store to see if they're available for Teams*.

Go to .slack.com/apps/manage to get a list of Apps and Custom Integrations. This page also shows you the number of configurations where each app is in use. Custom Integrations vary in their "migrate-ability." If it's a Web Hook, you can usually send it to a Microsoft 365 or Office 365 Connector to shift the workflow into Teams. Assess bots and other apps on a case-by-case basis to plan for moving them to Teams.

* If your administrator has restricted apps usage, you may not be looking at the full list of available apps.

Users

The identity schemes you used in Slack might not map directly to Microsoft 365 or Office 365. For example, the email addresses of your Slack users may not map to Microsoft 365 or Office 365 work or school accounts. You should create a user-ID map before you start planning your Teams rollout.

If you're on a paid Slack service plan, you can go to *.slack.com/admin/stats#members* to get member details such as email address and account type for each user (for example, single vs. multi-channel guest).

Here's a script you can use to compare email addresses from a Slack export against Azure AD to help solve for name ambiguity. It'll also report if the user is enabled for Teams. If you need help with PowerShell, read Get started with Azure PowerShell.

```
Connect-AzureAD
Function Get-TimeStamp {
    return "[{0:MM/dd/yy} {0:HH:mm:ss}]" -f (Get-Date)
}

class User {
    [ValidateNotNullOrEmpty()] $ID
    [ValidateNotNullOrEmpty()] $FullName
    [string] $Email
    [string] $UPN
    [ValidateNotNullOrEmpty()][bool] $ExistsAzureAD
    [ValidateNotNullOrEmpty()][bool] $TeamsEnabled
}

$output = New-Object -type System.Collections.ObjectModel.Collection["User"]

$users = Get-Content -Raw -Path .\slackHistory\users.json | ConvertFrom-Json

Write-Host -ForegroundColor Green "$(Get-Timestamp) User Count: " $users.Count

$i=1
Write-Host "$(Get-Timestamp) Attempting direct email match.. `n"
foreach ($slackUser in $users) {
    $user = New-Object User
    $user.id = $slackUser.id
    $user.FullName = $slackUser.name
    try {
        if ($null -ne $slackUser.profile.email) {
            $user.email = $slackUser.profile.email
            $emailSplit = $slackUser.profile.email.Split('@')
            $mailNickName = $emailSplit[0]
```

```
            $result = Get-AzureADUser -Filter "MailNickName eq '$($mailNickName)' or UserPrincipalName eq
'$($slackUser.profile.email)' or proxyAddresses/any(c:c eq 'smtp:$($slackUser.profile.email)')"
            if ($null -ne $result) {
                $user.ExistsAzureAD = $true
                $user.UPN = $result.UserPrincipalName
                $assignedPlans = $result.assignedPlans
                foreach ($plan in $assignedPlans) {
                    if ($plan.ServicePlanId -eq "57ff2da0-773e-42df-b2af-ffb7a2317929") {
                        if ($plan.CapabilityStatus -eq "Enabled") {
                            $user.TeamsEnabled = $true
                        }
                        else {
                            $user.TeamsEnabled = $false
                        }
                    }
                }
                Write-Host -ForegroundColor Green "$(Get-Timestamp) Current User $($i) - AzureAD object found:"
$result.MailNickName
                Write-Host -ForegroundColor Green "$(Get-Timestamp) Current User $($i) - Teams Enabled:"
$user.TeamsEnabled
            }
            else {
                $user.ExistsAzureAD = $false
                Write-Host -ForegroundColor Yellow "$(Get-Timestamp) Current User $($i) - AzureAD object not
found: " $slackUser.profile.email
            }
        }
        $i++
    }
    catch
    {
        $user.ExistsAzureAD = $false
        Write-Host -ForegroundColor Yellow "$(Get-Timestamp) Current User $($i) - AzureAD object not found:
$($i)" $user.profile.email
        $i++
    }
    $output.Add($user)
}

$output | Export-Csv -Path .\SlackToAzureADIdentityMapping.csv -NoTypeInformation
Write-Host "`n $(Get-Timestamp) Generated SlackToAzureADIdentityMapping.csv. Exiting..."
$output | Export-Csv -Path .\SlackToAzureADIdentityMapping.csv -NoTypeInformation
Write-Host "`n $(Get-Timestamp) Generated SlackToAzureADIdentityMapping.csv. Exiting..."
```

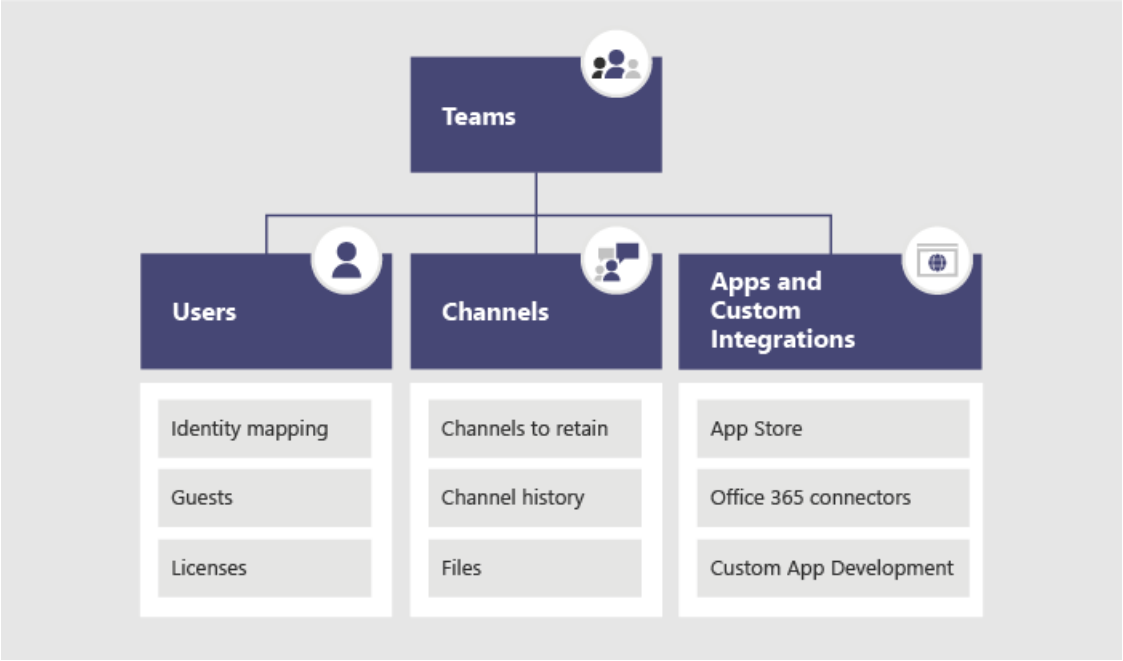
When you're done with this section, you should have:

- A list of Channels per Workspace with usage statistics.
- A list of Slack Apps with configurations per channel.
- Determined what type of Slack message history you want to export (if any).
- A list of users whose Slack accounts map to Microsoft work or school accounts and which Teams license they have.

Plan your Teams deployment

You've exported what you need from Slack (and left behind anything you don't need). Now it's time to plan how you'll roll out Teams and import your Slack data. This is a great opportunity to assess what's worked well for the team based on usage and include those elements in your Teams deployment plan. At the end of this section, you'll have a blueprint for your Teams users, channels, and apps.

The diagram below gives you a high-level outline of the things you'll address in your Teams deployment.



Team and channel structure

A Slack Workspace may represent a single team, multiple teams or an entire organization. It's important to understand the scope of the Workspaces as you determine the structure. The closest relationship to a Teams team in Slack is the Workspace, which contains a collection of channels. The diagram below demonstrates 3 different Slack-to-Teams mappings, and guidance for picking the right one for each Workspace.

SLACK-TO-TEAMS MAPPING	
1 Slack Workspace → 1 team	For smaller Slack workspaces that need fewer than 200 channels Include a buffer for growth and private channel planning
1 Slack Workspace → multiple teams	Use your Slack Workspace analytics data to create logical channel groupings, which become the basis of your teams
2+ Slack Workspaces → multiple teams	Use your Slack Workspace analytics data to create logical team and channel groupings, which become the basis of your teams

Third-party solutions have usage statistics to help you assess how active the channel is and how many posts there are. Typically, channels that are frequently used would be candidates to include in your team planning.

> **TIP**
>
> Retain only what is required in your approach to determine which channels to recreate in Teams. To learn more, read Overview of teams and channels.

Team Planning

Using the Channel inventory you compiled in the Planning section above, work with your Slack owners and admins to figure out which channels should become teams and which ones should become channels in a team. Use either Excel or PowerBI to help with this analysis - both can provide additional insights to help drive these discussions on which channels to retain.

> **TIP**
>
> Teams currently has a 200-channel limit per team. If your list of channels is getting close to that limit, you should figure out a way to split them into two separate teams.

Channel History

There are both free solutions on GitHub and paid solutions you can use, depending on your organization's requirements to retain Channel History of Public and Private channels. Additionally, this could be scripted into Teams.

Once you've set up your new team and channel structure in Teams, you can copy the exported files into the appropriate document libraries in your Teams channels.

To automate the importing of your content, there are several approaches you can consider. There are free solutions on GitHub (ChannelSurf or Slack Export Viewer) and partner solutions. Choose a solution based on your organization's needs.

Channel Files

Most solutions will export files. However, they're typically provided as links in the Channel History that require an API key to programmatically retrieve.

For files stored in Slack, once you've set up your teams and channels in Teams, you can programmatically copy them from Slack into the target Teams channel.

The following script retrieves files from Slack. It searches the specified Slack export on your computer, creates a folder in each target channel, and downloads all of the files to that location. Third-party solutions exist that can extract data. If you need help with PowerShell, read Get started with Azure PowerShell.

```
$ExportPath = ".\slackHistory"
$ExportContents = Get-ChildItem -path $ExportPath -Recurse
Function Get-TimeStamp {
    return "[{0:MM/dd/yy} {0:HH:mm:ss}]" -f (Get-Date)
}

class File {
    [string] $Name
    [string] $Title
    [string] $Channel
    [string] $DownloadURL
    [string] $MimeType
    [double] $Size
    [string] $ParentPath
    [string] $Time
}

$channelList = Get-Content -Raw -Path .\slackHistory\channels.json | ConvertFrom-Json
$Files = New-Object -TypeName System.Collections.ObjectModel.Collection["File"]

Write-Host -ForegroundColor Green "$(Get-TimeStamp) Starting Step 1 (processing channel export for files) of 2.
Total Channel Count: $($channelList.Count)"
#Iterate through each Channel listed in the Archive
foreach ($channel in $channelList) {
    #Iterate through Channel folders from the Export
    foreach ($folder in $ExportContents)
    {
        #If Channel Name matches..
        if ($channel.name -eq $folder){
            $channelJsons = Get-ChildItem -Path $folder.FullName -File
            Write-Host -ForegroundColor White "$(Get-TimeStamp) Info: Starting to process
$($channelJsons.Count) days of content for #$($channel.name)."
            #Start processing the daily JSON for files
```

```
            foreach ($json in $channelJsons){
                $currentJson = Get-Content -Raw -Path $json.FullName | ConvertFrom-Json
                #Write-Host -ForegroundColor Yellow "$(Get-TimeStamp) Info: Processing $($json.Name) in
#$($channel.name).."
                #Iterate through every action
                foreach ($entry in $currentJson){
                    #If the action contained file(s)..
                    if($null -ne $entry.files){
                        #Iterate through each file and add it to the List of Files to download
                        foreach ($item in $entry.Files) {
                        $file = New-Object -TypeName File
                            if ($null -ne $item.url_private_download){
                                $file.Name = $item.name
                                $file.Title = $item.Title
                                $file.Channel = $channel.name
                                $file.DownloadURL = $item.url_private_download
                                $file.MimeType = $item.mimetype
                                $file.Size = $item.size
                                $file.ParentPath = $folder.FullName
                                $file.Time = $item.created
                                $files.Add($file)
                            }
                        }
                    }
                }
            }
        }
    }
}
Write-Host -ForegroundColor Green "$(Get-TimeStamp) Step 1 of 2 complete. `n"

Write-Host -ForegroundColor Green "$(Get-TimeStamp) Starting step 2 (creating folders and downloading files) of
2."
#Determine which Files folders need to be created
$FoldersToMake = New-Object System.Collections.ObjectModel.Collection["string"]
foreach ($file in $files){
    if ($FoldersToMake -notcontains $file.Channel){
        $FoldersToMake.Add($file.Channel)
    }
}

#Create Folders
foreach ($folder in $FoldersToMake){
    #$fullFolderPath = $file.ParentPath + "\Files"
    $fullFolderPath = $ExportPath +"\$($folder)"
    $fullFilesPath = $ExportPath +"\$($folder)\Files"
    if (-not (Test-Path $fullFilesPath)){
        New-Item -Path $fullFolderPath  -Name "Files" -ItemType "directory"
    }
}

#Downloading Files
foreach ($file in $files)
{
    Write-Host -ForegroundColor Yellow "$(Get-TimeStamp) Downloading $($file.Name)."
    $fullFilePath = $file.ParentPath + "\Files\" + $file.Name
        if (-not (Test-Path $fullFilePath)){
            try{
                $request = (New-Object System.Net.WebClient).DownloadFile($file.DownloadURL, $fullFilePath)
            }
            catch [System.Net.WebException]{
                Write-Host -ForegroundColor Red "$(Get-TimeStamp) Error: Unable to download $($file.Name) to
$($fullFilePath)"
            }
        }
        else {
            try{
                $extensionPosition = $file.name.LastIndexOf('.')
                $splitFileName = $file.name.Substring(0,$extensionPosition)
```

```
                $splitFileExtention = $file.name.Substring($extensionPosition)
                $newFileName = $splitFileName + $file.Time + $splitFileExtention
                $fullFilePath = $file.ParentPath + "\Files\" + $newFileName
                $request = (New-Object System.Net.WebClient).DownloadFile($file.DownloadURL, $fullFilePath)
            }
            catch [System.Net.WebException]{
                Write-Host -ForegroundColor Red "$(Get-TimeStamp) Error: Unable to download $($file.Name) to
$($fullFilePath)"
            }
        }
}
Write-Host -ForegroundColor Green "$(Get-TimeStamp) Step 2 of 2 complete. `n"
Write-Host -ForegroundColor Green "$(Get-TimeStamp) Exiting.."
```

Apps and Custom Integrations

Review your list of Slack apps and custom integrations (with configurations) and decide which ones you want to move to Teams. Check the Teams Marketplace to see if an app is available. If not, there are likely alternatives.

To figure out which apps to add to Teams, it's important to understand how the app is being used. By asking the question "what functionality is the app providing to this channel?", you'll learn about the outcome the app is delivering.

In many cases, apps primarily receive event-driven data from an external service (for example, monitoring system) and push a message into Slack. You can achieve the same outcome by using a Microsoft 365 Connector that can push messages into Teams based on events.

Below are examples of Slack solutions where a Microsoft 365 Connector was used in Teams for integration.

- Ansible
  - Alerts can be sent to Teams via Ansible webhook
- New Relic
  - Check out this user solution for sending New Relic alerts to Teams
- Nagios
  - Alerts can be integrated today via Connectors. https://github.com/isaac-galvan/nagios-teams-notify
- ZenDesk
  - App exists in Teams Store
- Jenkins
  - Alerts can be sent to Teams using Jenkins's Office 365 Connector

User readiness and adoption plan

The cornerstone of any successful software deployment hinges on how prepared users are for the change. Users in your organization using Slack will easily understand Teams concepts, but training is still needed to help them make a smooth transition. For a comprehensive set of Teams adoption resources, go to the Teams adoption hub.

For example, both products feature channels, but they're used differently in each product. For example, often a Channel in Slack is used like a chat in Teams for short-term, transactional conversations. Other notable differences are around threaded/non-threaded conversations and tuning notification settings.

Check out our rich library of End-user Teams video training.

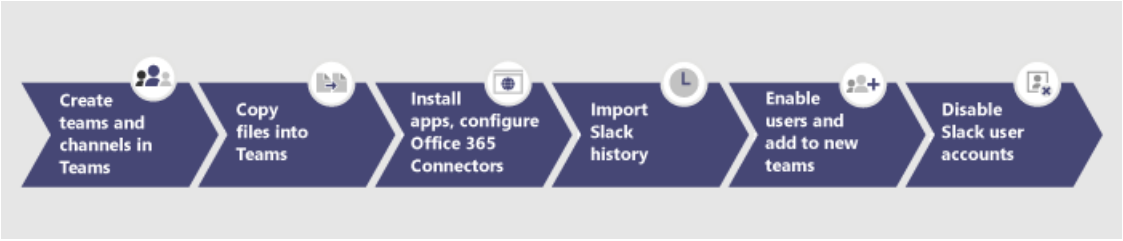
Move to Teams

Now that your transition plan is defined, you can begin creating your teams and channels in Teams.

Once you've created your teams & channels, begin copying files from Slack channels into Teams and configuring your apps. If you're using a solution to retain history, that can be configured now as well. Then you're ready to start licensing users (if they aren't licensed already) and adding them to the appropriate teams. To reduce the need for

additional exports and file copies, consider removing Slack access at an agreed-upon date that coincides with each user's addition to the team. This avoids needing to re-export and import delta changes on files and history.

Follow the steps in the diagram below to roll out Teams in your organization. For more information, check out How to roll out Teams.



Get started with Teams templates in the admin center

11/2/2020 • 3 minutes to read • Edit Online

Custom templates are not yet supported for EDU customers.

> **NOTE**
> Teams templates currently don't support creating private channels. Private channel creation isn't included in template definitions.

Teams templates are pre-built definitions of a team's structure designed around a business need or project. Use pre-built templates or create your own template. Teams templates let you quickly create rich collaboration spaces with channels for different topics and preinstall apps to pull in mission-critical content and services. Teams templates provide a predefined team structure that can help you easily create consistent teams across your organization. Currently you can create a team from a template in Teams or using Microsoft Graph.

This article describes the properties that can be defined in templates, what base template types are, and how you can use a few samples requests to create a team from a template.

This article is for you if you're responsible for planning, deploying, and managing multiple teams across your organization

Teams template capabilities

Most properties in a team are included and supported by templates. But there are a few properties and features that aren't currently supported. The following table provides a quick summary of what's included and what's not included in Teams templates.

TEAM PROPERTIES SUPPORTED BY TEAMS TEMPLATES	TEAM PROPERTIES NOT YET SUPPORTED BY TEAMS TEMPLATES
Base template type	Team membership
Team name	Team picture
Team description	Channel settings
Team visibility (public or private)	Connectors
Team settings (for example, member, guest, @ mentions)	Files and content
Autofavorite channel	
Installed app	
Pinned tabs	

NOTE

We'll be adding more template capabilities in future releases of Microsoft Teams, so check back for the most up-to-date information on supported properties.

What are base template types

Base template types are special templates that Microsoft created for specific industries. These base templates often contain proprietary apps that aren't available in the apps store.

Once a base template type is defined, you can extend or override these special templates with additional properties that you'd like to specify. Some base template types contain properties that can't be overridden.

NOTE

Pre-defined base templates provided in Microsoft Teams can be duplicated but not edited.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Adopt Office 365	`com.microsoft.teams.template.AdoptOfficeTeam`	Channels: • General • Announcements • Champions corner • Team forms Apps: • Wiki • Calendar
Manage a project	`com.microsoft.teams.template.ManageAProject`	Channels: • General • Announcements • Resources • Planning Apps: • Wiki • OneNote

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Manage an event	`com.microsoft.teams.template.ManageAnEvent`	Channels: • General • Announcements • Budget • Content • Logistics • Planning • Marketing and PR Apps: • Wiki • Website • YouTube • Planner • OneNote
Onboard employees	`com.microsoft.teams.template.OnboardEmployees`	Channels: • General • Announcements • Employee chat • Training Apps: • Wiki • Communities
Organize help desk	`com.microsoft.teams.template.OrganizeHelpDesk`	Channels: • General • Announcements • FAQ Apps: • Wiki • OneNote
Collaborate on patient care	`healthcareWard`	Channels: • General • Announcements • Huddles • Rounds • Staffing • Training Apps: • Wiki

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Collaborate on global crisis or event	`com.microsoft.teams.template.CollaborateOnAGlobalCrisisOrEvent`	Channels: • General • Announcements • World news • Business continuity • Remote working • Internal comms • External comms • Customer complaints • Kudos • Executive update Apps: • Praise • Wiki • Website
Collaborate within a bank branch	`com.microsoft.teams.template.CollaborateWithinABankBranch`	Channels: • General • Announcements • Huddles • Customer meetings • Coaching • Skills development • Loan processing • Customer complaints • Kudos • Fun stuff • Compliance
Coordinate incident response	`com.microsoft.teams.template.CoordinateIncidentResponse`	Channels: • General • Announcements • Logistics • Planning • Recovery • Urgent Apps: • Wiki • Excel • OneNote • SharePoint • Planner

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Hospital	`healthcareHospital`	Channels: • General • Announcements • Compliance • Custodial • Human resources • Pharmacy Apps: • Wiki
Organize a store	`retailStore`	Channels: • General • Shift handoff • Learning Apps: • Wiki
Quality and safety	`com.microsoft.teams.template.QualitySafety`	Channels: • General • Announcements • Line 1 • Line 2 • Line 3 • Safety • Training • Maintenance • Fun stuff Apps: • Wiki
Retail - manager collaboration	`retailManagerCollaboration`	Channels: • General • Operations • Learning Apps: • Wiki

For more information about the template categories, see the following categories:

- Financial templates
- General templates
- Government templates
- Healthcare templates
- Manufacturing templates
- Retail templates

Template size limits

Templates are limited to a specific number of channels, tabs, and apps.

> **NOTE**
>
> You can add more channels, tabs, and apps to the team after it's been created from a template.

FEATURE	LIMIT
Channels per template	15
Tabs per channel in a template	20
Apps per template	50

See Limits and specifications of Teams for more information.

Related topics

- Create a custom team template
- Create a team template from an existing team template
- Create a template from an existing team

Teams templates built in Microsoft Graph for Small and Medium Businesses

9/28/2020 • 4 minutes to read • Edit Online

Microsoft Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

For small and medium businesses, templates can be especially powerful, as they help administrators to quickly deploy Teams across their organization. Templates also help orient users and get started with using Teams effectively. This article is for you if you're responsible for planning, deploying, and managing multiple teams across your organization.

We currently offer three first-party SMB templates that you can leverage for a variety of situations. All templates will create *Private* Teams. Once you have created the Teams and are ready to roll out to your organization, you can set the privacy to *Org-Wide* or *Public*, as appropriate. To learn more about team templates in general, see Get started with Teams templates.

Company-Wide template

The Company-Wide template is meant for communication and collaboration that are relevant for the entire company. You can use the General channel for company-wide announcements, industry news or executive posts. The Human Resources channel is a great place to consolidate all HR-related activities like job posts, new employee onboarding, training, and development. The Fun Stuff channel provides a social platform for all random and fun posts.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
SMB - Company-wide	`https://graph.microsoft.com/beta/teamsTemplates('SmallBusinessOrgWide')`	Channels • General* • Human Resources* • Fun Stuff* Apps • Company Portal (Website pinned to the **Human Resources** channel) Team properties • Team visibility set to Private

*Auto-favorited channels

To create the Company-Wide team by taking defaults from the pre-defined template, supply the JSON representation of the team object in the request body. To learn more about how to deploy Teams templates, see the Microsoft Graph article on creating a Team.

Request

```
POST https://graph.microsoft.com/beta/teams
Content-Type: application/json
{
    "template@odata.bind": "https://graph.microsoft.com/beta/teamsTemplates('SmallBusinessOrgWide')",
    "displayName": "Org-wide",
    "description": "All posts that are relevant for entire company (e.g. Company-wide announcements, Exec
posts, employee poll/feedback).",
    "visibility": "Private"
}
```

Executive Team template

The Executive Team template is ideal for creating a team for company executives to communicate and collaborate on company initiatives like annual priorities, fiscal budgets, strategic initiatives, and top clients. This template comes with a *Private* channel to invite select users for specific topics.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
SMB - Executives Team	`https://graph.microsoft.com/beta/teamsTemplates('SmallBusinessExecutive')`	Channels • General* • Private * Apps • OneNote (pinned to the **Private** channel) • Planner (pinned to the **Private** channel) Team properties • Team visibility set to Private

*Auto-favorited channels

To create the Executives team by taking defaults from the pre-defined template, supply the JSON representation of the team object in the request body. To learn more about how to deploy Teams templates, see the Microsoft Graph article on creating a Team.

Request

```
POST https://graph.microsoft.com/beta/teams
Content-Type: application/json
{
    "template@odata.bind": "https://graph.microsoft.com/beta/teamsTemplates('SmallBusinessExecutive')",
    "displayName": "Executive",
    "description": "All posts, announcements and daily collaboration and communication for the company's
leadership team.",
    "visibility": "Private"
}
```

Departmental Team template

The Departmental team template can be used for creating a team for individual departments or for projects. The Finance team template is ideal for all posts, announcements, and daily collaboration and communication within the Finance team members and executive team members as appropriate. The template comes with a *Private* channel to invite select users for specific topics. We also provide the script below for the Finance team that can be used to extend the template to additional departments or specific projects by adding, deleting from, or editing to your

liking. For example, if you have a *Marketing* department, then the script can be adapted by renaming the team from *Finance* to *Marketing* to create a new Marketing team

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
SMB - Finance	`https://graph.microsoft.com/beta/teamsTemplates('SmallBusinessFinance')`	Channels • General* • Private * Apps • OneNote (pinned to the **Private** channel) • Planner (pinned to the **Private** channel) Team properties • Team visibility set to Private

*Auto-favorited channels

To create the Finance team by taking defaults from the pre-defined template, supply the JSON representation of the team object in the request body. To learn more about how to deploy Teams templates, see the Microsoft Graph article on creating a Team.

Request

```
POST https://graph.microsoft.com/beta/teams
Content-Type: application/json
{
    "template@odata.bind": "https://graph.microsoft.com/beta/teamsTemplates('SmallBusinessFinance')",
    "displayName": "Finance",
    "description": "All posts, announcements and daily collaboration and communication within the Finance team
members (and exec team members as appropriate).",
    "visibility": "Private"
}
```

Example: Finance Team template extension script

```
{
  "template@odata.bind": "https://graph.microsoft.com/beta/teamsTemplates('standard')",
  "displayName": "Finance",
  "description": "Finance Team",
  "channels":
   [
        {
            "displayName": "Private",
            "isFavoriteByDefault": true,
            "description": "Invite a more select audience for specific topics.",
             "tabs":
             [
                {
                    "teamsApp@odata.bind": "https://graph.microsoft.com/v1.0/appCatalogs/teamsApps('0d820ecd-
def2-4297-adad-78056cde7c78')",
                    "name": "OneNote"
                },
                {
                    "teamsApp@odata.bind":
"https://graph.microsoft.com/v1.0/appCatalogs/teamsApps('com.microsoft.teamspace.tab.planner')",
                    "name": "Planner"
                }
```

```
            ]
        }
    ],
    "memberSettings":
    {
        "allowCreateUpdateChannels": true,
        "allowDeleteChannels": true,
       "allowAddRemoveApps": true,
        "allowCreateUpdateRemoveTabs": true,
        "allowCreateUpdateRemoveConnectors": true
    },
    "guestSettings":
    {
        "allowCreateUpdateChannels": false,
        "allowDeleteChannels": false
    },
    "funSettings":
    {
        "allowGiphy": true,
        "giphyContentRating": "Moderate",
        "allowStickersAndMemes": true,
        "allowCustomMemes": true
    },
    "messagingSettings":
    {
        "allowUserEditMessages": true,
        "allowUserDeleteMessages": true,
        "allowOwnerDeleteMessages": true,
        "allowTeamMentions": true,
        "allowChannelMentions": true
    },
    "discoverySettings":
    {
        "showInTeamsSearchAndSuggestions": true
    },
    "installedApps":
    [
        {
            "teamsApp@odata.bind": "https://graph.microsoft.com/v1.0/appCatalogs/teamsApps('0d820ecd-def2-
4297-adad-78056cde7c78')"
        },
        {
            "teamsApp@odata.bind":
"https://graph.microsoft.com/v1.0/appCatalogs/teamsApps('com.microsoft.teamspace.tab.planner')"
        }
    ]
}
```

Related topics

- Get started with Teams templates in the admin console
- Get started with Teams templates
- Create team (in preview)

Create a custom team template in Microsoft Teams

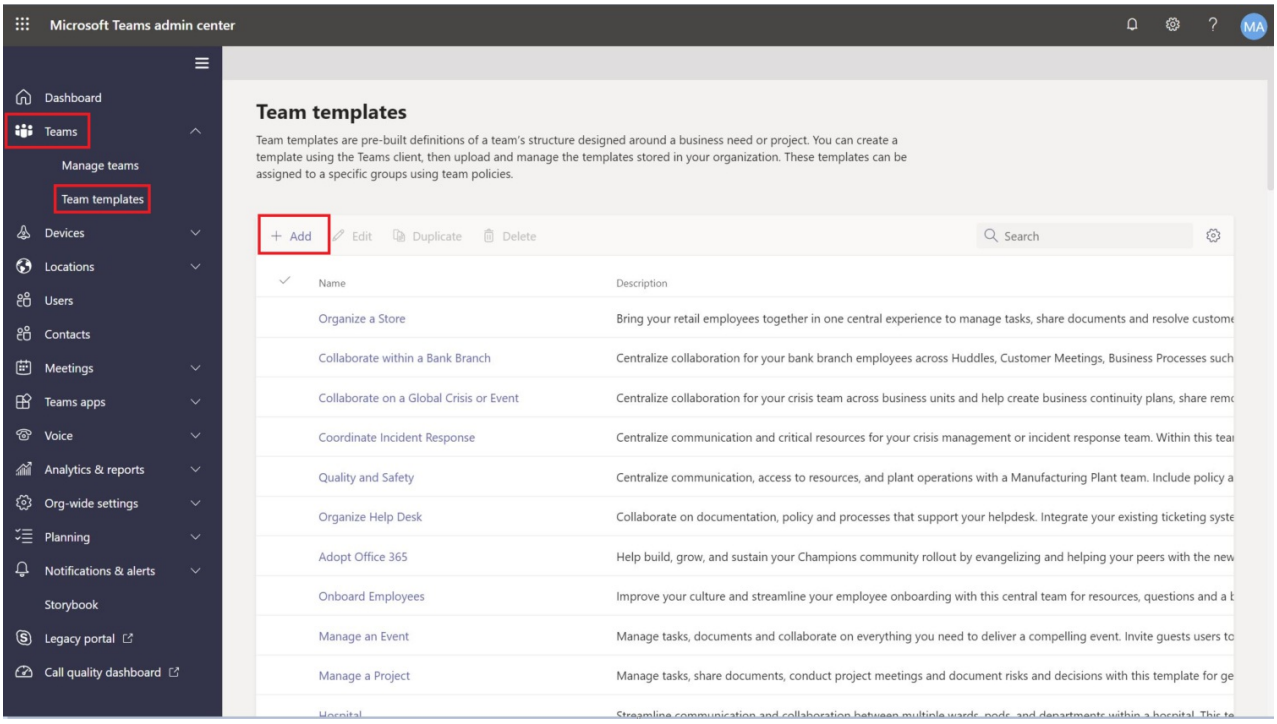
11/2/2020 • 2 minutes to read • Edit Online

Custom templates are not yet supported for EDU customers.

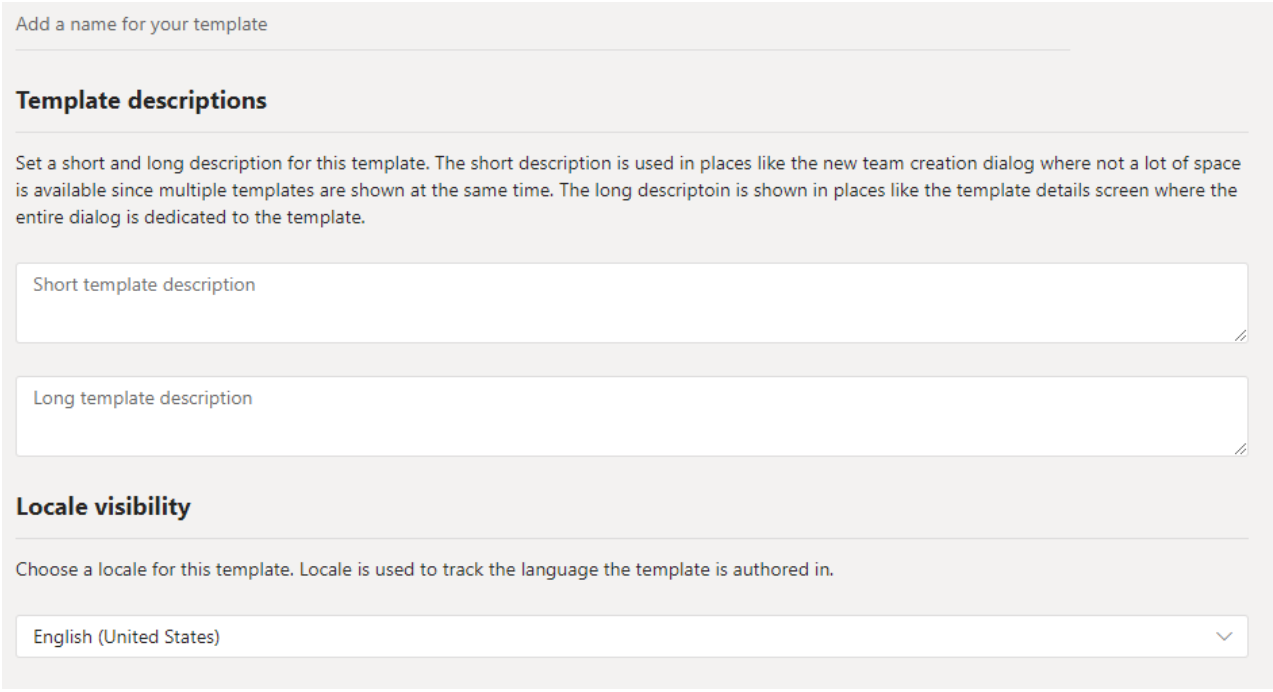
A custom team template is a predefined team structure with a set of channels, tabs, and apps. You can develop a template that helps you create the right collaboration space quickly. Your custom team template uses your preferred settings.

To get started:

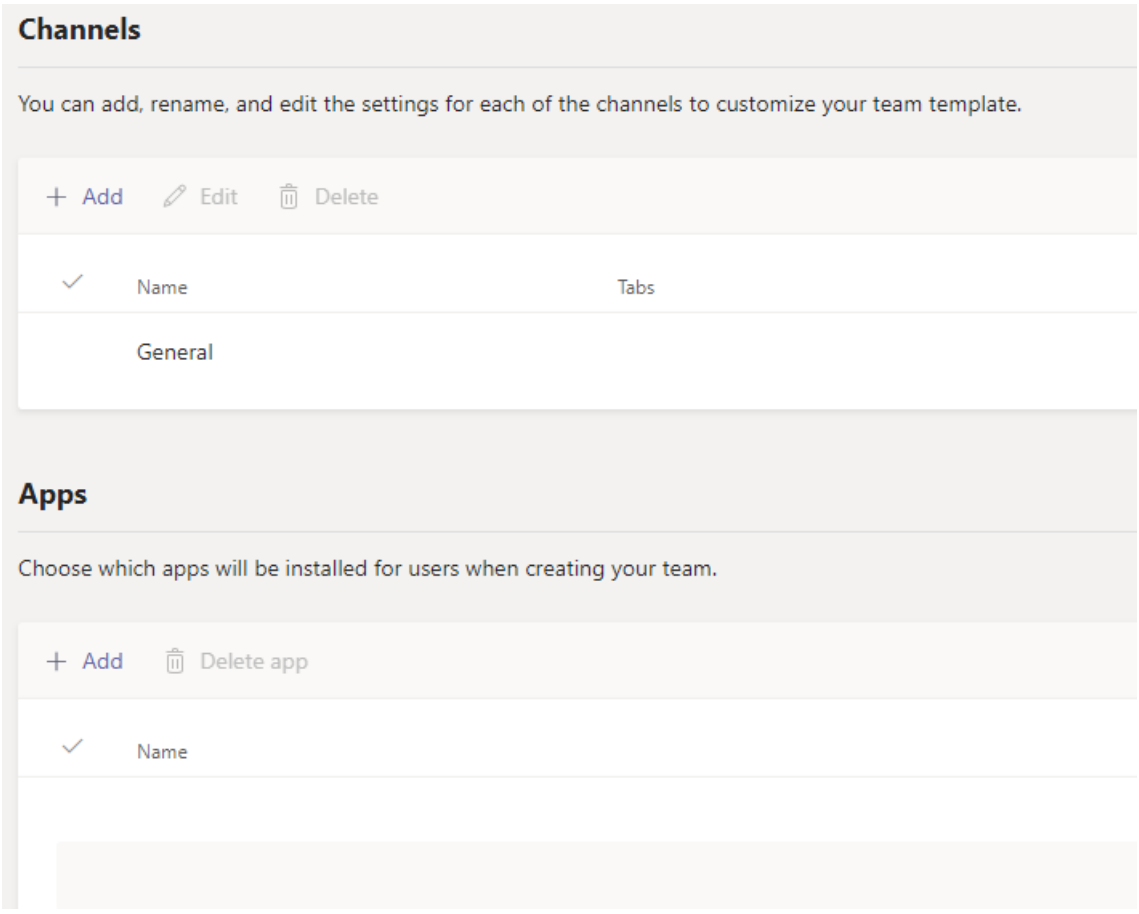
1. Log in to the Teams admin center.
2. In the left navigation, expand **Teams** > **Team templates**.
3. Click **Add**.



4. In the **Team templates** section, select **Create a brand new template**.
5. In the **Template settings** section, complete the following fields and then click **Next**:
   - Template name
   - Template short and long descriptions
   - Locale visibility



6. In the **channels, tabs, and apps** section, add any channels and apps that your team needs.
    a. In the **Channels** section, click **Add**.
    b. In the **Add** dialog, name the channel.
    c. Add a description.
    d. Decide if the channel should be shown by default.
    e. Search for an app name that you want to add to the channel.
    f. Click **Apply** when finished.



8. Click **Submit** when completed.

Your new template is displayed in the **Team templates** list. The template can be used to create a team in Teams.

> **NOTE**
>
> It can take up to 24 hours for teams users to see a custom template in the gallery.

Related topics

- Get started with team templates in the admin center
- Create a template from an existing team
- Create a team template from an existing team template

Create a template from an existing team in Microsoft Teams

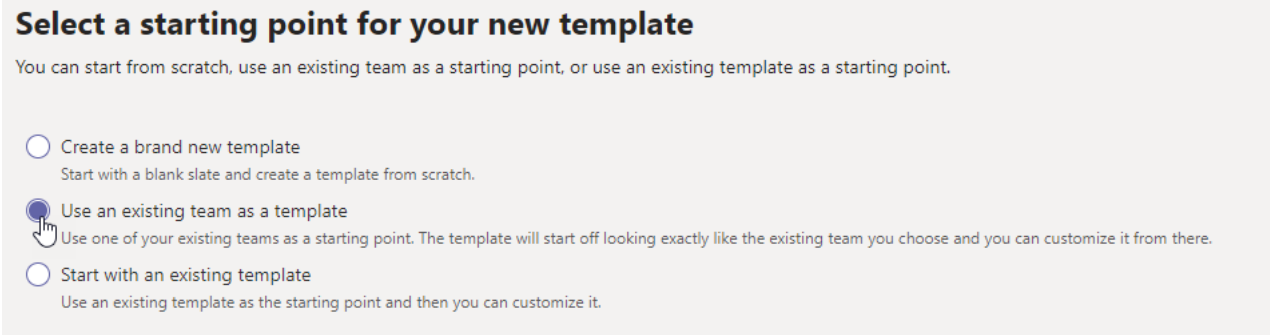
9/29/2020 • 2 minutes to read • Edit Online

This is a preview or early release feature.

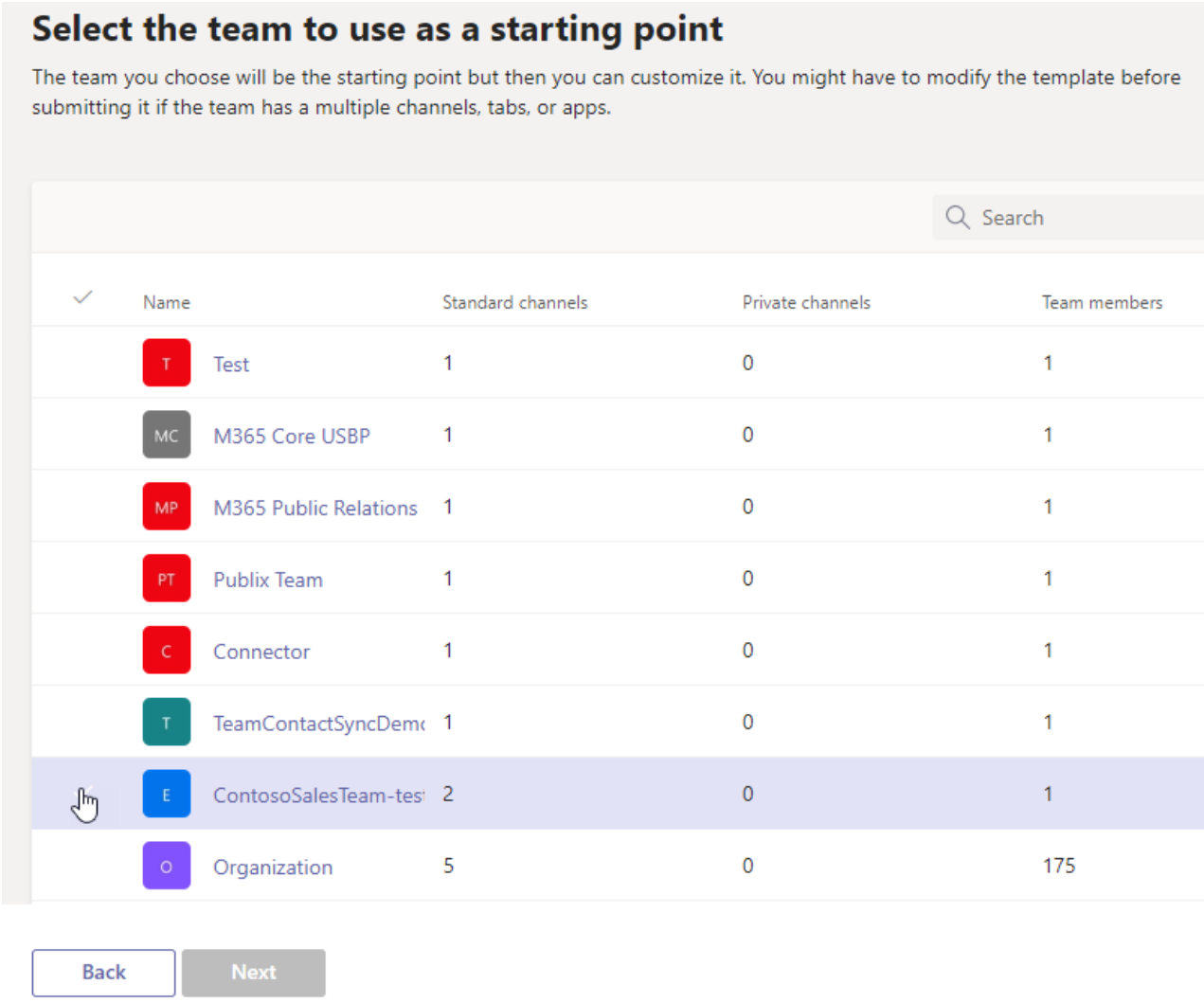
Custom templates are not yet supported for EDU customers.

Microsoft Teams lets you create a template from an existing team that can be saved and modified to meet your particular organizational needs.

1. Sign in to the Teams admin center.
2. In the left navigation, expand **Teams** > **Team templates**.
3. Select **Add**.
4. Select **Use an existing team as a template**, and select **Next**.



5. Select a team to use as a starting point by selecting next to the team name, and then select **Next**.



6. In the **Template settings** section, complete the following fields and then select **Next**:
   - Template name
   - Template short and long descriptions
   - Locale visibility
7. In the **channels, tabs, and apps** section, add any channels and apps that your team needs.
   a. In the **Channels** section, select **Add**.
   b. In the **Add** dialog, name the channel.
   c. Add a description.
   d. Decide if the channel should be shown by default.
   e. Search for an app name that you want to add to the channel.
   f. Select **Apply** when finished.
8. Select **Submit** to save your changes.

Your new template is displayed in the **Team templates** list. The template can be used to create a team in Teams.

> **NOTE**
> It can take up to 24 hours for teams users to see a custom template in the gallery.

Related articles

- Get started with team templates in the admin center

- Create a template from an existing team template
- Create a team template

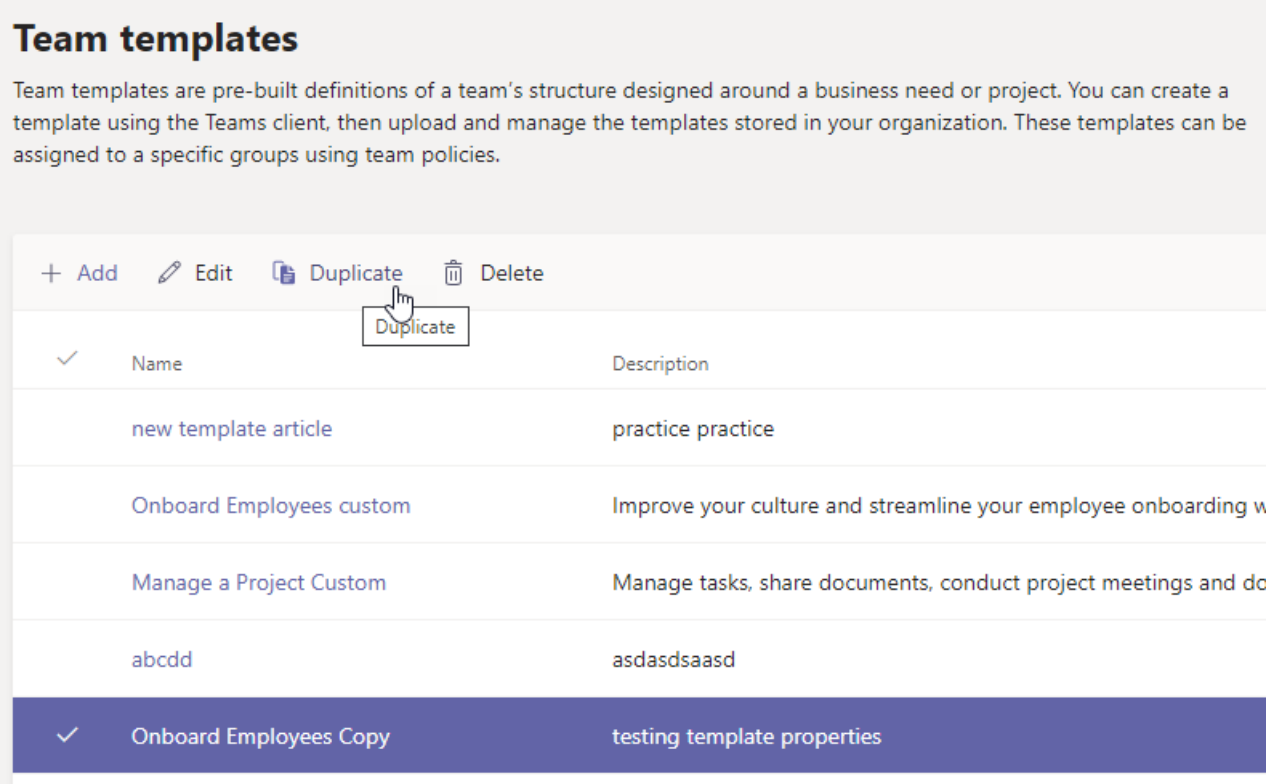
Create a new template from an existing team template in Microsoft Teams

11/2/2020 • 2 minutes to read • Edit Online

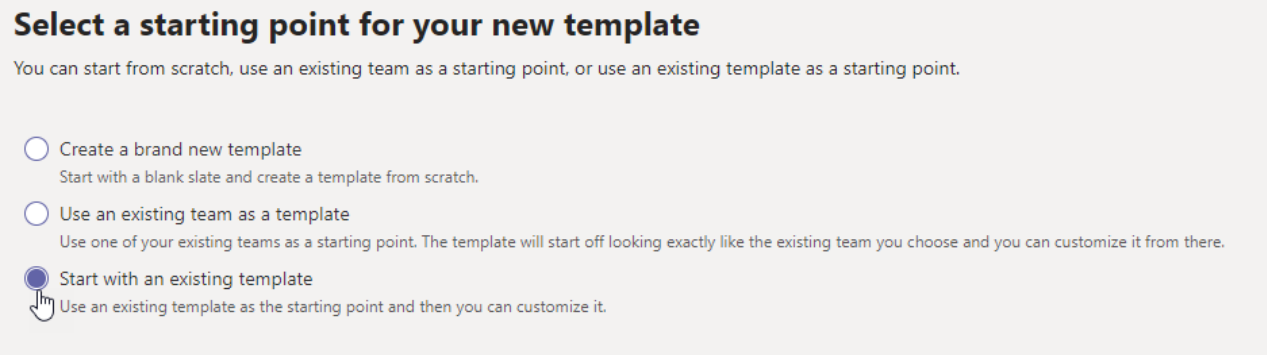
Custom templates are not yet supported for EDU customers.

Microsoft Teams provides pre-built templates that can be saved and modified to meet your particular organizational needs.

1. Sign in to the Teams admin center.
2. In the left navigation, expand **Teams** > **Team templates**.
3. In the **Team templates** section, select next to a template that you want to duplicate to highlight it.
4. Select **Duplicate**.



(Alternatively, you can select **Add** > **Start with an existing template** to open **Select the template to use as a starting point**.)



5. In the **Select the template to use as a starting point** screen, select **Next**.

   The duplicated template opens, and the word **Copy** is appended to the name.

6. Complete the following fields and then select **Next**:

   - Template name
   - Template short and long descriptions
   - Locale visibility

7. In the **channels, tabs, and apps** section, modify any existing channels and apps that your team needs.

   a. Select a channel to edit, and select **Edit**.
   b. **Apply** your changes when finished.

8. Add any channels or apps that your team needs.

   a. In the **Channels** section, select **Add**.
   b. In the **Add** dialog, name the channel.
   c. Add a description.
   d. Decide if the channel should be shown by default.
   e. Search for an app name that you want to add to the channel.
   f. Select **Apply** when finished.

9. Select **Submit** when you're finished adding channels and apps.

   The new template is saved to the template library.

> **NOTE**
> It can take up to 24 hours for teams users to see a custom template in the gallery.

Related articles

- Get started with team templates in the admin center
- Create a template from an existing team
- Create a team template

Use Teams financial templates in the admin center

10/12/2020 • 2 minutes to read • Edit Online

Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

Teams templates have pre-built definitions of team structures designed around financial needs. You can also extend the Teams templates to create teams that are tailored to your specific organizational needs.

In this article, we'll introduce each of the Teams templates and recommend how to use them.

This article is for you if you're responsible for planning, deploying, and managing multiple teams across your financial organization. You've already deployed Teams service in your organization. If you haven't yet rolled out Teams, start by reading the How to roll out Microsoft Teams.

To learn more about team templates in general, refer to Get started with Teams templates.

Global crisis or event

Centralize collaboration for your crisis team across business units and help create business continuity plans, share remote working tips, track customer communications, and keep everyone in the loop with announcements and news.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Collaborate on global crisis or event	`com.microsoft.teams.template.CollaborateOnGlobalCrisisOrEvent`	Channels: • General • Announcements • World news • Business continuity • Remote working • Internal comms • External comms • Customer complaints • Kudos • Executive update Apps: • Praise • Wiki • Website

Collaborate within a bank branch

Centralize collaboration for your bank branch employees across Huddles, Customer Meetings, Business Processes such as Mortgage Collaboration, and keep everyone in the loop with Announcements and Kudos.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Collaborate within a bank branch	`com.microsoft.teams.template.CollaborateWithinABankBranch`	Channels: • General • Announcements • Huddles • Customer meetings • Coaching • Skills development • Loan processing • Customer complaints • Kudos • Fun stuff • Compliance

Use general Teams templates in the admin center

11/2/2020 • 2 minutes to read • Edit Online

This is a preview or early release feature.

Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

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Global crisis or event

Centralize collaboration for your crisis team across business units and help create business continuity plans, share remote working tips, track customer communications, and keep everyone in the loop with announcements and news.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Collaborate on global crisis or event	`com.microsoft.teams.template.CollaborateOnGlobalCrisisOrEvent`	Channels: • General • Announcements • World news • Business continuity • Remote working • Internal comms • External comms • Customer complaints • Kudos • Executive update Apps: • Praise • Wiki • Website

Adopt Office 365

Help build, grow, and sustain your Champions community rollout by evangelizing and helping your peers with the new technology.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Adopt Office 365	`com.microsoft.teams.template.AdoptOfficeM365`	Channels: • General • Announcements • Champions corner • Team forms Apps: • Wiki • Calendar • Skills development • Loan processing • Customer complaints • Kudos • Fun stuff • Compliance

Manage a project

Manage tasks, share documents, conduct project meetings and document risks and decisions with this template for general project management.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Manage a project	com.microsoft.teams.template.ManageAProject	Channels: • General • Announcements • Resources • Planning Apps: • Wiki • OneNote

Manage an event

Manage tasks, documents, and collaborate on everything you need to deliver a compelling event. Invite guests users to have secure collaboration inside and outside of your company.

You might not have access to certain apps based on your app permission policy.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Manage an event	`com.microsoft.teams.template.ManageAnEvent`	Channels: • General • Announcements • Budget • Content • Logistics • Planning • Marketing and PR Apps: • Wiki • Website • YouTube • Planner • OneNote

Onboard employees

Improve your culture and streamline your employee onboarding with this central team for resources, questions, and a bit of fun.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Onboard employees	`com.microsoft.teams.template.OnboardEmployees`	Channels: • General • Announcements • Employee chat • Training Apps: • Wiki • Communities

Organize a help desk

Collaborate on documentation, policy, and processes that support your helpdesk. Integrate your existing ticketing system or use our template to manage requests.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Organize help desk	`com.microsoft.teams.template.OrganizeHelpDesk`	Channels: • General • Announcements • FAQ Apps: • Wiki • OneNote

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE

Use Teams manufacturing templates in the admin center

11/2/2020 • 2 minutes to read • Edit Online

Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

Teams templates have pre-built definitions of team structures designed around manufacturing needs. You can also extend the Teams templates to create teams that are tailored to your specific organizational needs.

In this article, we introduce each of the Teams templates and recommend how to use them.

This article is for you if you're responsible for planning, deploying, and managing multiple teams across your manufacturing organization. You've already deployed Teams service in your organization. If you haven't yet rolled out Teams, start by reading the How to roll out Microsoft Teams.

To learn more about team templates in general, refer to Get started with Teams templates.

Quality and safety

Centralize communication, access to resources, and plant operations with a Manufacturing Plant team. Include policy and procedure documents, training videos, safety notices, shift handover processes.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Quality and safety	`com.microsoft.teams.template.QualitySafety`	Channels: • General • Announcements • Line 1 • Line 2 • Line 3 • Safety • Training • Maintenance • Fun stuff Apps: • Wiki

Call and chat with users from other organizations in Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

When you need to communicate and collaborate with people outside your organization, Microsoft Teams gives you two different ways to make that happen. The first – **external access** (federation) – lets you find, call, and chat with users in other domains (for example, contoso.com). The second – **guest access** – lets you add individuals to your teams, as guests, using their email address. You can collaborate with guests as you would with any other users in your organization.

You can use both external access and guest access if you want - one doesn't preclude the other.

At a high level, here's how to choose (for a detailed comparison, jump down to Compare external and guest access):

External access

Use **external access** (federation) when you need a solution that lets external users in other domains find, call, chat, and set up meetings with you. External users have no access to your organization's teams or team resources. Choose external access when you want to communicate with users outside your organization who are still on Skype for Business (online or on premises) or Skype (coming in early 2020).

External access is turned on by default in Teams, which means your org can communicate with all external domains. The Teams admin can turn it off or specify which domains to include (or exclude). To learn more, read Manage external access.

If you want external users to have access to teams and channels, guest access might be a better way to go.

Guest access

Use **guest access** to add an individual user (regardless of domain) to a team, where they can chat, call, meet, and collaborate on organization files (stored in SharePoint or OneDrive for Business), using Microsoft 365 or Office 365 apps such as Word, Excel, or PowerPoint. A guest user can be given nearly all the same Teams capabilities as a native team member. To learn more, read Guest access in Teams.

- Guests are added to your organization's Active Directory.
- To communicate with a guest, the guest has to be signed in to Teams using their guest account. This means that a guest may have to sign out of their own Teams account to sign in to your Teams account, or switch organizations if it's the same account.
- Guest users have access to more resources in Teams - such as files, teams, and channels - than external-access (federated) users.
- The Teams admin controls everything that a guest can (or can't) do in the Teams admin center. To learn more, read Manage guest access.

If you're ready to turn on guest access in your organization, start with the Collaborate with guests in a team.

Compare external and guest access

FEATURE	EXTERNAL ACCESS USERS	GUEST ACCESS USERS
User can chat with someone in another company	Yes	Yes
User can call someone in another company	Yes	Yes
User can see if someone from another company is available for call or chat	Yes	Yes[1]
User can search for users across external tenants	Yes[2]	No
User can share files	No	Yes
User can access Teams resources	No	Yes
User can be added to a group chat	No	Yes
User can be invited to a meeting	Yes	Yes
Additional users can be added to a chat with an external user	No[3]	N/A
User is identified as an external party	Yes	Yes
Presence is displayed	Yes	Yes
Out of office message is shown	No	Yes
Individual user can be blocked	No	Yes
@mentions are supported	Yes[4]	Yes
Make private calls	Yes	Yes
View the phone number for dial-in meeting participants	No[5]	Yes
Allow IP video	Yes	Yes
Screen sharing mode	Yes[4]	Yes
Allow meet now	No	Yes
Edit sent messages	Yes[4]	Yes
Can delete sent messages	Yes[4]	Yes
Use Giphy in conversation	Yes[4]	Yes
Use memes in conversation	Yes[4]	Yes

FEATURE	EXTERNAL ACCESS USERS	GUEST ACCESS USERS
Use stickers in conversation	Yes[4]	Yes

[1] Provided that the user has been added as a guest and is signed in as a guest to the guest tenant.
[2] Only by email or Session Initiation Protocol (SIP) address.
[3] External (federated) chat is 1:1 only.
[4] Supported for 1:1 chat for Teams Only to Teams Only users from two different organizations.
[5] By default, external participants can't see the phone numbers of dialed-in participants. If you want to maintain the privacy of these phone numbers, select **Tones** for **Entry/exit announcement type** (this prevents the numbers from being read out by Teams). To learn more, read Turn on or off entry and exit announcements for meetings in Microsoft Teams.

Related topics

External access in Teams

Guest access in Teams

Manage external access in Microsoft Teams

12/5/2020 • 7 minutes to read • Edit Online

External access is a way for Teams users from an entire external domain to find, call, chat, and set up meetings with you in Teams. You can also use external access to communicate with external users who are still using Skype for Business (online and on-premises) and Skype (in preview).

> **NOTE**
> The allowed or blocked domains only apply to meetings if anonymous access to meetings is "off".

If you want external users to have access to teams and channels, guest access might be a better way to go. For more information about the differences between external access and guest access, see Compare external and guest access.

Use external access when:

- You have users in different domains who need to collaborate. For example, Rob@contoso.com and Ann@northwindtraders.com are working on a project together along with some others in the contoso.com and northwindtraders.com domains.
- You want the people in your organization to use Teams to contact people in specific businesses outside of your organization.
- You want anyone else in the world who uses Teams to be able to find and contact you, using your email address.

> **IMPORTANT**
> To use the Teams client to communicate with an external user (whether that user is using Teams or Skype for Business), the Teams user must be homed in Skype for Business Online.

Plan for external access

By default, external access is turned on in Teams, which means that your organization can communicate with all external domains. If you add blocked domains, all other domains will be allowed; and if you add allowed domains, all other domains will be blocked. The exception to this rule is if anonymous participants are allowed in meetings. There are three scenarios for setting up external access in the Teams admin center (**Org-wide settings** > **External access**):

- **Open federation**: This is the default setting in Teams, and it lets people in your organization find, call, chat, and set up meetings with people external to your organization in any domain.

  In this scenario, your users can communicate with all external domains that are running Teams or Skype for Business AND are using open federation OR have added your domain to their allow list.

- **Allow specific domains**: By adding domains to an **Allow** list, you limit external access to only the allowed domains. Once you set up a list of allowed domains, all other domains will be blocked. To allow specific domains, click **Add a domain**, add the domain name, click **Action to take on this domain**, and then select **Allowed**.

- **Block specific domains** - By adding domains to a **Block** list, you can communicate with all external domains *except* the ones you've blocked. To block specific domains, click **Add a domain**, add the domain name, click **Action to take on this domain**, and then select **Blocked**. Once you set up a list of blocked domains, all other domains will be allowed.

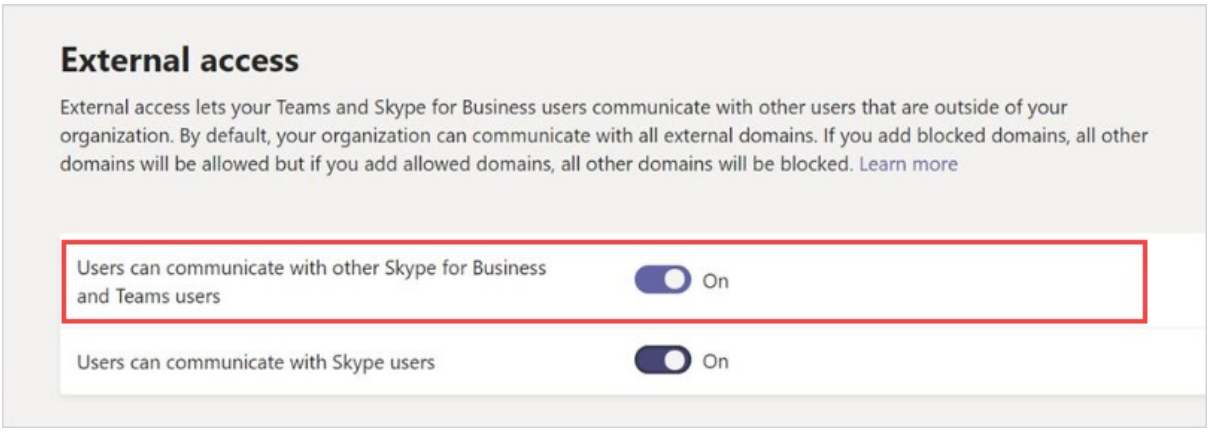
> **NOTE**
> If you turn off external access in your organization, external users can still join meetings through anonymous join. To learn more, see Manage meeting settings in Teams.

Allow or block domains

Step 1 - Enable your organization to communicate with another Teams or Skype for Business organizations

Using the Microsoft Teams admin center

1. In the left navigation, go to **Org-wide settings** > **External access**.
2. Turn on the **Users can communicate with other Skype for Business and Teams users** setting.



.

3. If you want to allow all Teams organizations to communicate with users in your organization, skip to step 5.
4. If you want to limit the organizations that can communicate with users in your organization, you can either allow all except some domains, or you can allow only specific domains.
   - To allow all except some domains, add the domains you want to block by clicking **Add domain**. In the **Add a domain** pane, type the domain name, click **Blocked**, and then click **Done**.
   - To limit communications to specific organizations, add those domains to the list with a status of **Allowed**. Once you have added any domain to the Allow list, communications with other organizations will be limited to only those organizations whose domains are in the Allow list.
5. Click **Save**.
6. Make sure the admin in the other Teams organization completes these same steps. For example, in their **allowed domains** list, their admin needs to enter the domain for your business if they limit the organizations that can communicate with their users.

Step 2 - Test it

To test your setup, you need a Teams user who's not behind your firewall.

1. After you and the admin from the organization have changed the **External access** settings, you should be good to go.
2. In the Teams app, search for the person by email address, and send a request to chat.

3. Ask your Teams contact to send you a request to chat. If you don't receive their request, the problem is your firewall settings (assuming they've already confirmed their firewall settings are correct).

4. Another way to test whether the problem is your firewall is to go to a WiFi location not behind your firewall. such as a coffee shop, and use Teams to send a request to your contact to chat. If the message goes through at the WiFi location, but does not when you're at work, then you know the problem is your firewall.

> **NOTE**
> If you and another user both turn on external access and allow one another's domains, this will work. If it doesn't work, the other user should make sure their configuration isn't blocking your domain.

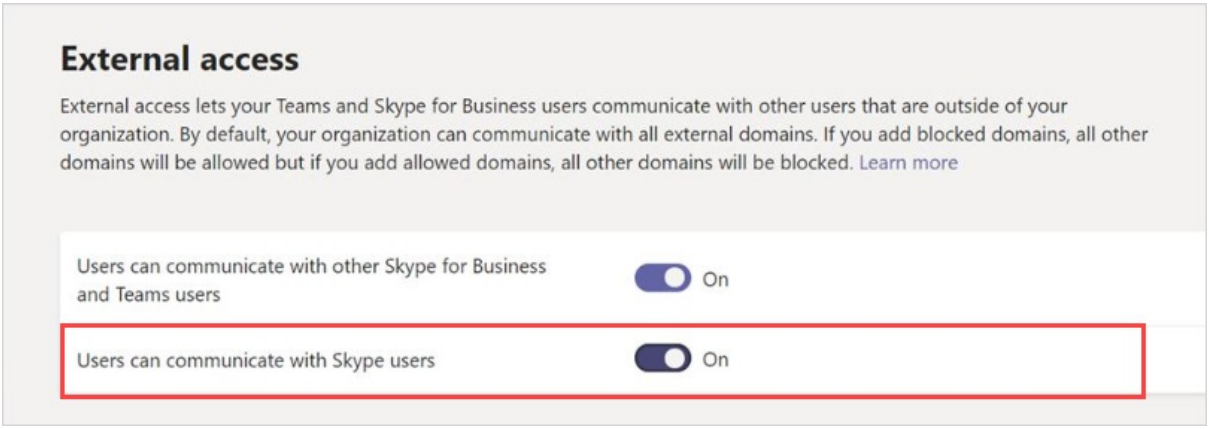
Communicate with Skype users (in preview)

Follow these steps to let Teams users in your organization chat with and call Skype users. Teams users can then search for and start a one-on-one text-only conversation or an audio/video call with Skype users and vice versa.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Org-wide settings** > **External access**.

2. Turn on the **Users can communicate with Skype users** setting.



.

To learn more about the ways that Teams users and Skype users can communicate, including limitations that apply, see Teams and Skype interoperability.

Common external access scenarios

The following sections describe how to enable federation for common external access scenarios, and how the TeamsUpgradePolicy determines delivery of incoming chats and calls.

Enable federation

To enable users in your organization to communicate with users in another organization, both organizations must enable federation. The steps to enable federation for a given organization depend on whether the organization is purely online, hybrid, or purely on-premises.

IF YOUR ORGANIZATION IS	ENABLE FEDERATION AS FOLLOWS

IF YOUR ORGANIZATION IS	ENABLE FEDERATION AS FOLLOWS
Online with no Skype for Business on-premises. This includes organizations that have TeamsOnly users and/or Skype for Business Online users.	If using Teams Admin Center: - Make sure the **Users can communicate with other Skype for Business and Teams users** setting is enabled in External Access. - If you are not using open federation (which allows federation with any other domain), then add the external domain to the Allowed list. If using PowerShell: - Ensure the tenant is enabled for federation: `Get-CsTenantFederationConfiguration` must show `AllowFederatedUsers=true`. - Ensure the user's effective value of `CsExternalAccessPolicy` has `EnableFederationAccess=true`. - If you are not using open federation, ensure the target domain is listed in `AllowedDomains` of `CsTenantFederationConfiguration`.
Pure on-premises	In on-premises tools: - Ensure federation is enabled in `CsAccessEdgeConfiguration`. - Ensure federation for the user is enabled through `ExternalAccessPolicy` (either through the global policy, site policy, or user assigned policy). - If you are not using open federation, ensure the target domain is listed in `AllowedDomains`.
Hybrid with some users online (in either Skype for Business or Teams) and some users on-premises.	Follow above steps for both online and on-premises organizations.

Delivery of incoming chats and calls

Incoming chats and calls from a federation organization will land in the user's Teams or Skype for Business client depending on the recipient user's mode in TeamsUpgradePolicy.

IF YOU WANT TO	DO THIS:
Ensure incoming federated chats and calls arrive in the user's Teams client:	Configure your users to be TeamsOnly.
Ensure incoming federated chats and calls arrive in the user's Skype for Business client	Configure your users to be in any mode other than TeamsOnly.

Enable federation between users in your organization and consumer users of Skype

To enable federation between users in your organization and consumer users of Skype:

IF YOUR ORGANIZATION IS	ENABLE CONSUMER FEDERATION AS FOLLOWS

IF YOUR ORGANIZATION IS	ENABLE CONSUMER FEDERATION AS FOLLOWS
Pure online with no Skype for Business on-premises. This includes organizations that have TeamsOnly users and/or Skype for Business Online users.	If using Teams Admin Center: -Make sure **Users can communicate with Skype users** is enabled in External Access. If using PowerShell: -Ensure the tenant is enabled for federation: `Get-CsTenantFederationConfiguration` must show `AllowPublicUsers=true`. - Ensure the user's effective value of `CsExternalAccessPolicy` has `EnablePublicCloudAccess=true`.
Pure on-premises	In on-premises tools: - Ensure Skype is enabled as a federated partner. - Ensure `EnablePublicCloudAccess=true` for the user through `ExternalAccessPolicy` (either via global policy, site policy, or user assigned policy).
Hybrid with some users online (in either Skype for Business or Teams) and some users on-premises.	Follow above steps for both online and on-premises organizations.

IMPORTANT

You don't have to add any **Skype domains** as allowed domains in order to enable Teams or Skype for Business Online users to communicate with Skype users inside or outside your organization. All **Skype domains** are whitelisted, which means all of these domains are considered ALLOWED.

How does external access compare with guest access?

To learn about the difference between external access and guest access, read Communicate with users from other organizations.

Related topics

- Native chat experience for external (federated) users

Native chat experience for external (federated) users in Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

When a Microsoft Teams user is chatting with an external (federated) user, the chat experience is limited to text. However, if both your Teams user and the external user is in the TeamsOnly upgrade mode, you can have a "native-Teams chat experience," which includes rich formatting, @mentions, and other chat features. In other words, you can have the same rich 1:1 Teams chat experience with eligible external users as you'd have with users in your organization. Native Teams chats with external users are still limited to 1:1 chats only (external users can't do group chats).

The native chat experience for external users is turned on for all Teams tenants, but not all users are eligible. To be offered a native chat experience, both the sender and receiver need to be configured for TeamsOnly upgrade mode. To learn more about upgrade policies, read Setting your coexistence and upgrade settings.

To see a list of capabilities for external access users in Teams, see Compare external and guest access.

How do I know if I'm in a native chat?

If you can only exchange text in your chat with an external user, then you're in a standard external-access (federated) chat. If you've got all of the other chat functionality, including formatting, @mentions, emojis, etc., then you're in a native Teams chat with your external user.

Teams periodically checks the upgrade mode for external users and, when it finds an external user running Teams in the TeamsOnly upgrade mode, it'll prompt you to switch to a native Teams chat and lock the original chat.

When you switch to a native Teams chat, Teams doesn't merge the two conversations. Instead, you'll see both of the chats in your chat feed. The new, native-Teams chat is active, but the old, text-only chat is locked.

What happens if a user isn't in Teams Only mode anymore?

If you were having a native Teams chat with an external user and then one of you gets switched out of the TeamsOnly upgrade mode, Teams locks the native Teams chat and gives you a link for a limited, text-only chat. You won't be able to continue in the native Teams chat. You can still read the native Teams chat, but you can't continue the conversation there.

If Teams finds an old text-only chat with this external user, it'll revive that chat. Otherwise, Teams creates a new text-only chat.

Related topics

Manage external access in Teams

Teams and Skype interoperability

12/5/2020 • 4 minutes to read • Edit Online

This article gives you an overview of the interoperability capabilities between Microsoft Teams and Skype (Consumer). Learn how Teams users and Skype users can communicate through chats and calls and the admin controls that apply.

Teams users in your organization can chat with and call Skype users by using their email address and vice versa.

- Teams users can search for and start a one-on-one text-only conversation or an audio/video call with a Skype user.
- Skype users can search for and start a one-on-one text-only conversation or an audio/video call with a Teams user.

These capabilities are available on the desktop, web, and mobile (Android and iOS) clients for both Teams and Skype. For an optimal experience, we recommend Skype version 8.58 and later.

> **NOTE**
> The Teams and Skype interop capabilities discussed in this article aren't available in GCC, GCC High, or DOD deployments, or in private cloud environments.

Chat and calling experience

Here's an overview of the chat and calling experience.

Teams user starts a chat or call with a Skype user

Teams users can search for a Skype user by typing their email address in a new chat or in the search bar. The Teams user can then select the Skype user in the search results to start a chat or call with them.

A Skype user may choose not to appear in search results. In this case, they won't show up in the search results in Teams and Teams users won't be able to find them.

Skype user starts a chat or call with a Teams user

Skype users can search for and start a chat with a Teams user by using their email address. The Teams user is notified that they have a new message from a Skype user, and has to first accept the message before they can reply to it.

- If the Teams user selects **Accept**, the conversation is accepted, and both users can chat and call each other.
- If the Teams user selects **Block**, the conversation is blocked, and subsequent messages and calls from that Skype user are blocked.
- If the Teams user selects **View messages**, the message is displayed in Teams, which helps the user decide whether to accept or block the conversation.

> **NOTE**
> If you upgraded from Skype for Business to Teams and your users are in Teams Only mode, chats and calls from Skype users to Teams users are delivered to Teams. If your users are in Islands mode, chats and calls from Skype users to Teams users are delivered to Skype for Business.

Teams user blocks or unblocks a Skype user

After a Teams user accepts or blocks the initial conversation request from a Skype user, they can choose to block or unblock that person at any time. They can do this either in the conversation or in their privacy settings in Teams. Skype users won't know that they've been blocked.

Blocked Skype users, along with other people and public switched telephone network (PSTN) phone numbers that a Teams user has blocked, are listed on the user's blocked contact list in Teams.

Limitations

- Conversations are text-only. This means that there's no rich formatting, @mentions, emojis, or other any of the other chat features that are available in a native Teams chat experience.
- Conversations are one-on-one only. Group chats aren't supported.
- Teams users and Skype users can't see each other's presence.
- Searching for Skype users by using their Skype ID or phone number isn't supported.
- Skype users can't call Teams users who set up call forwarding to another user's number, a delegate's number, or a Public Switched Telephone Network (PSTN) number. Only voicemail is supported.
- Interop escalation, group calls, and meetings aren't supported.
- The ability for a delegate to call a Skype user on behalf of a Teams user isn't supported.
- Screen sharing with chat isn't supported.

Set whether Teams users can communicate with Skype users

As an admin, you use the Microsoft Teams admin center or PowerShell to set external access settings to control whether Teams users in your organization can communicate with Skype users. By default, this capability is turned on for new tenants. However, there's a prerequisite that the following DNS SRV record needs to be configured by the IT Admin if not already available for your domain, for example _sipfederationtls.contoso.com.

Service: sipfederationtls
Protocol: TCP
Priority: 100
Weight: 1
Port: 5061
Target: sipfed.online.lync.com

If you upgraded from Skype for Business to Teams, the external communications settings that you configured in the Skype for Business admin center are migrated to Teams.

In the Microsoft Teams admin center

In the Microsoft Teams admin center, go to **Org-wide settings** > **External access**, and then turn on **Users can communicate with Skype users**. For step-by-step guidance on how to configure this and other external access settings, see Manage external access in Teams.

Using PowerShell

Do the following:

1. Use the Set-CsExternalAccessPolicy cmdlet together with the `EnablePublicCloudAccess` parameter to control whether Teams users can communicate with Skype users. Setting the parameter to `true` allows Teams users to communicate with Skype users. You can use the `EnablePublicCloudAudioVideoAccess` parameter to enable/disable audio/video calls.

2. Use the Set-CsTenantPublicProvider cmdlet together with the `Provider` parameter set to `"WindowsLive"` so that Teams users can communicate with Skype users.

Related topics

- Manage external access in Teams
- Teams PowerShell overview

Guest access in Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

With guest access, you can provide access to teams, documents in channels, resources, chats, and applications to people outside your organization, while maintaining control over your corporate data.

A guest is someone who isn't an employee, student, or member of your organization. They don't have a school or work account with your organization. For example, guests may include partners, vendors, suppliers, or consultants. Anyone who is not part of your organization can be added as guest in Teams. This means that anyone with a business account (that is, an Azure Active Directory account) or consumer email account (with Outlook.com, Gmail.com or others) can participate as a guest in Teams, with access to teams and channel experiences.

Guests in Teams are covered by the same compliance and auditing protection as the rest of Microsoft 365, and can be managed within Azure AD. Guest access is subject to Azure AD and Microsoft 365 or Office 365 service limits.

The guest experience has limitations by design. For a full list of what a guest can and can't do in Teams, see comparison of team member and guest capabilities.

> **IMPORTANT**
> Guest users follow Teams Org-wide settings for the coexistence Upgrade mode. This can't be changed.

To set up guest access, see Collaborate with guests in a team.

To compare external access (federation) with guest access (and decide which one you should use), read Communicate with users from other organizations in Teams.

Set up guest access

Guest access in Teams requires configuring other settings in Microsoft 365, including settings in Azure AD, Microsoft 365 Groups, and SharePoint. If you're ready to start inviting guests to teams, read one of the following:

- To configure guest access for Teams for general use, see Collaborate with guests in a team.
- To collaborate with a partner organization that uses Azure Active Directory and allow guests to self-enroll for team access, see Create a B2B extranet with managed guests.

Guest access in Teams is an organization-wide setting and is turned off by default. You can control guest access to individual teams by using sensitivity labels.

How a guest becomes a member of a team

1. A team owner or a Microsoft 365 admin adds a guest to a team.
2. The guest receives a welcome email from the team owner, with information about the team and what to expect now that they're a member.
3. The guest accepts the invitation. Guest users who have an work or school account in Azure Active Directory can accept the invitation and authenticate directly. Other users are sent a one-time pass code to validate their identity (One-time passcode authentication required).
4. After accepting the invitation, the guest can participate in teams and channels, receive and respond to channel messages, access files in channels, participate in chats, join meetings, collaborate on documents, and more.

In Teams, guests are clearly identified. A guest user's name includes the label **(Guest)**, and a channel includes an icon to indicate that there are guests on the team. For more details, see What the guest experience is like.

Guests can leave the team at any time from within Teams. For details, see How do I leave a team?

> **NOTE**
> Leaving the team doesn't remove the guest account from your organization's directory. This must be done by a Microsoft 365 global admin or an Azure AD admin.

Licensing for guest access

Guest access is included with all Microsoft 365 Business Standard, Microsoft 365 Enterprise, and Microsoft 365 Education subscriptions. No additional Microsoft 365 license is necessary. Teams doesn't restrict the number of guests you can add. However, the total number of guests that can be added to your tenant may be restricted by the paid features of Azure AD. For more information, see Billing model for Azure AD External Identities.

> **NOTE**
> Users in your organization who have standalone Microsoft 365 subscription plans only, such as Exchange Online Plan 2, cannot be invited as guests to your organization because Teams considers these users to belong to the same organization. For these users to use Teams, they must be assigned an Microsoft 365 Business Standard, Office 365 Enterprise, or Office 365 Education subscription.

Guest access reviews

You can use Azure AD to create an access review for group members or users assigned to an application. Creating recurring access reviews can save you time. If you need to routinely review users who have access to an application, a team, or are members of a group, you can define the frequency of those reviews.

You can perform a guest access review yourself, ask guests to review their own membership, or ask an application owner or business decision maker to perform the access review. Use the Azure portal to perform guest access reviews. For more information, see Manage guest access with Azure AD access reviews.

Related topics

Collaborating with people outside your organization

Block guest users from a specific Microsoft 365 group or Microsoft Teams team

Create a secure guest sharing environment

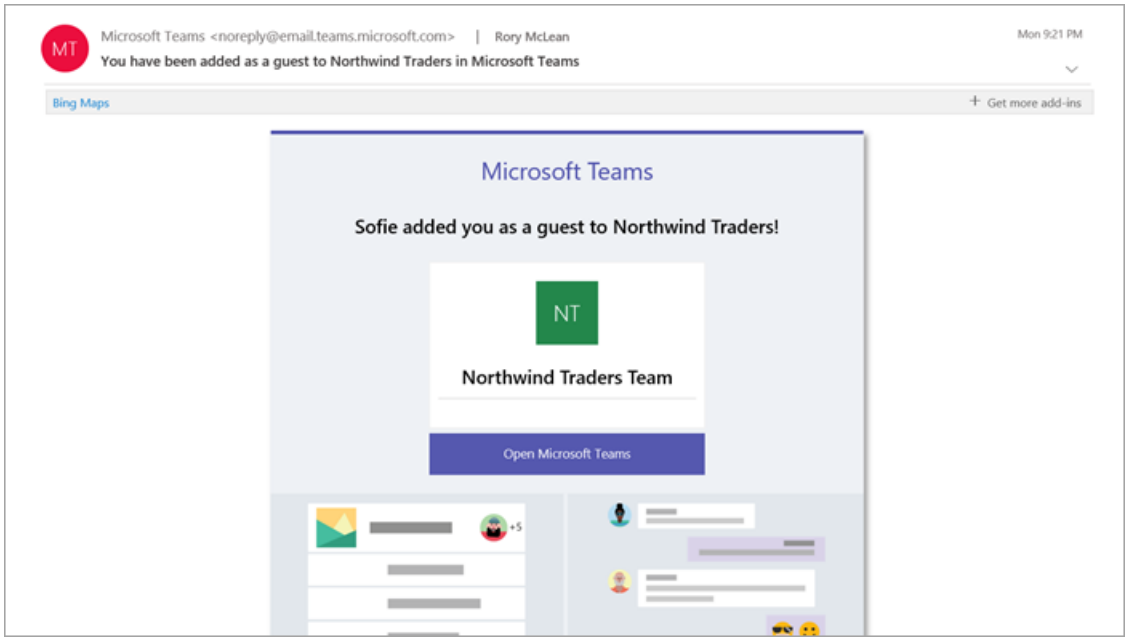
Contact support for business products - Admin Help

Configure Teams with three tiers of protection

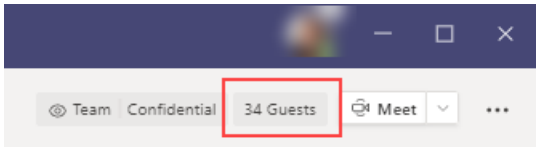
Guest experience in Teams

12/5/2020 • 3 minutes to read • Edit Online

When a guest is invited to join a team, they receive a welcome email message. This message includes some information about the team and what to expect now that they're a member. The guest must accept the invitation by selecting **Open Microsoft Teams** in the email message before they can access the team and its channels.



All team members see a message in the channel thread announcing that the team owner has added a guest and providing the guest's name. Everyone on the team can identify easily who is a guest. A tag in the upper-right corner of the channel thread indicates the number of guests on the team and a **(Guest)** label appears next to each guest's name.



Check out these videos about the guest experience in Teams:

- Join a team as a guest
- Join a Teams meeting with guests

Comparison of team member and guest capabilities

The following table compares the Teams functionality available for an organization's team members and its guests. Teams admins control the features available to guests.

CAPABILITY IN TEAMS	TEAMS USER IN THE ORGANIZATION	GUEST USER
Create a channel *Team owners control this setting.*	✓	✓
Participate in a private chat	✓	✓

CAPABILITY IN TEAMS	TEAMS USER IN THE ORGANIZATION	GUEST USER
Participate in a channel conversation	✓	✓
Post, delete, and edit messages	✓	✓
Share a channel file	✓	✓
Access SharePoint files	✓	✓
Attach files	✓	✓
Download private chat files	✓	✓
Search within files	✓	
Share a chat file	✓	
Add apps (tabs, bots, or connectors)	✓	
Create meetings or access schedules	✓	
Access OneDrive for Business storage	✓	
Create tenant-wide and teams/channels guest access policies	✓	
Invite a user outside the Microsoft 365 or Office 365 organization's domain *Team owners control this setting.*	✓	
Create a team	✓	
Discover and join a public team	✓	
View organization chart	✓	
Use inline translation	✓	
Become team owner	✓	

The following table shows the calling and meeting features available to guests, compared to other types of users.

CALLING FEATURE	GUEST	E1 AND E3 USER	E5 AND ENTERPRISE VOICE USER
VOIP calling	Yes	Yes	Yes
Group calling	Yes	Yes	Yes
Core call controls supported (hold, mute, video on/off, screen sharing)	Yes	Yes	Yes

CALLING FEATURE	GUEST	E1 AND E3 USER	E5 AND ENTERPRISE VOICE USER
Transfer target	Yes	Yes	Yes
Can transfer a call	Yes	Yes	Yes
Can consultative transfer	Yes	Yes	Yes
Can add other users to a call via VOIP	Yes	Yes	Yes
Can add users by phone number to a call	No	No	Yes
Forward target	No	Yes	Yes
Call group target	No	Yes	Yes
Unanswered target	No	Yes	Yes
Can be the target of a federated call	No	Yes	Yes
Can make a federated call	No	Yes	Yes
Can immediately forward their calls	No	No	Yes
Can simultaneously ring their calls	No	No	Yes
Can route their unanswered calls	No	No	Yes
Missed calls can go to voicemail	No	No[1]	Yes
Have a phone number that can receive calls	No	No	Yes
Can dial phone numbers	No	No	Yes
Can access call settings	No	No	Yes
Can change voicemail greeting	No	No[1]	Yes
Can change ringtones	No	No	Yes
Supports TTY	No	No	Yes
Can have delegates	No	No	Yes

CALLING FEATURE	GUEST	E1 AND E3 USER	E5 AND ENTERPRISE VOICE USER
Can be a delegate	No	No	Yes

[1] This feature will be available soon.

NOTE

The **Guest user access restrictions** policy in Azure Active Directory (Azure AD) determines permissions for guests in your directory. There are three policy options.

- The **Guest users have the same access as members (most inclusive)** setting means guests have the same access to directory data as regular users in your directory.
- The **Guest users have limited access to properties and membership of directory objects** settings means that guests don't have permissions for certain directory tasks, such as enumerating users, groups, or other directory resources using Microsoft Graph.
- The **Guest user access is restricted to properties and memberships of their own directory objects (most restrictive)** setting means guests can only access their own directory objects.

To learn more, see What are the default user permissions in Azure Active Directory?

Related topics

Leave an organization as a guest user

Authorize guest access in Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

To satisfy your organization's requirements, you can manage Teams guest access features and capabilities through four different levels of authorization. All the authorization levels apply to your Microsoft 365 organization. Each authorization level controls the guest experience as shown below:

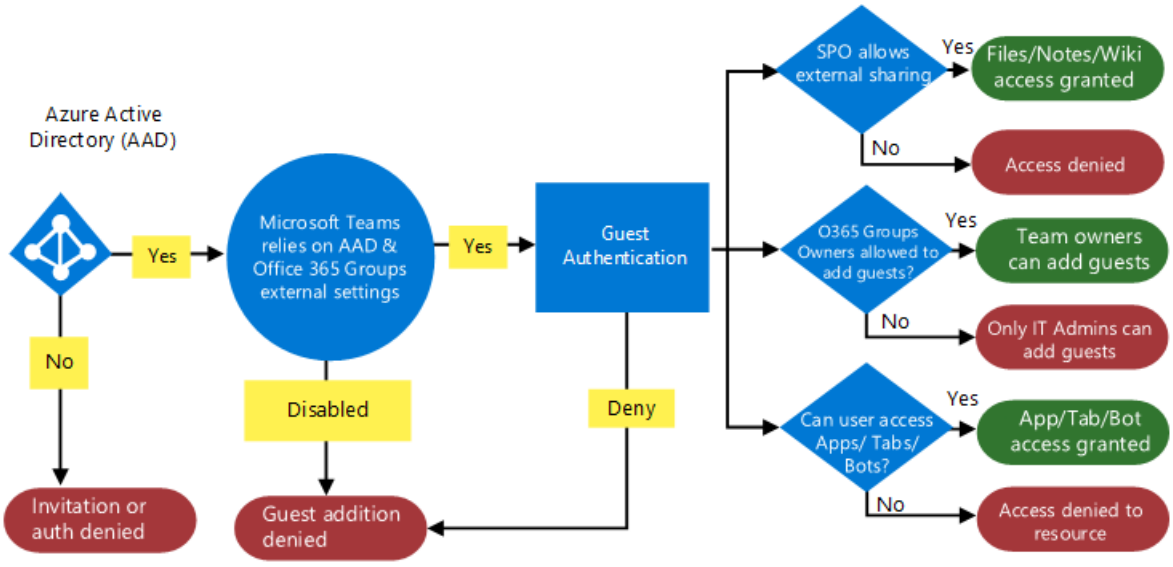
- **Azure Active Directory**: Guest access in Teams relies on the Azure AD business-to-business (B2B) platform. This authorization level controls the guest experience at the directory, tenant, and application level.
- **Teams**: Controls the guest experience in Teams only.
- **Microsoft 365 Groups**: Controls the guest experience in Microsoft 365 Groups and Teams.
- **SharePoint and OneDrive**: Controls the guest experience in SharePoint, OneDrive, Microsoft 365 Groups, and Teams.

These different authorization levels provide you with flexibility in how you set up guest access for your organization. For example, if you don't want to allow guest users in Teams but want to allow it overall in your organization, just turn off guest access in Teams. Another example: You could enable guest access at the Azure AD, Teams, and Groups levels, but then disable the addition of guest users on selected teams that match one or more criteria such as data classification equals confidential. SharePoint and OneDrive have their own guest access settings that don't rely on Microsoft 365 Groups.

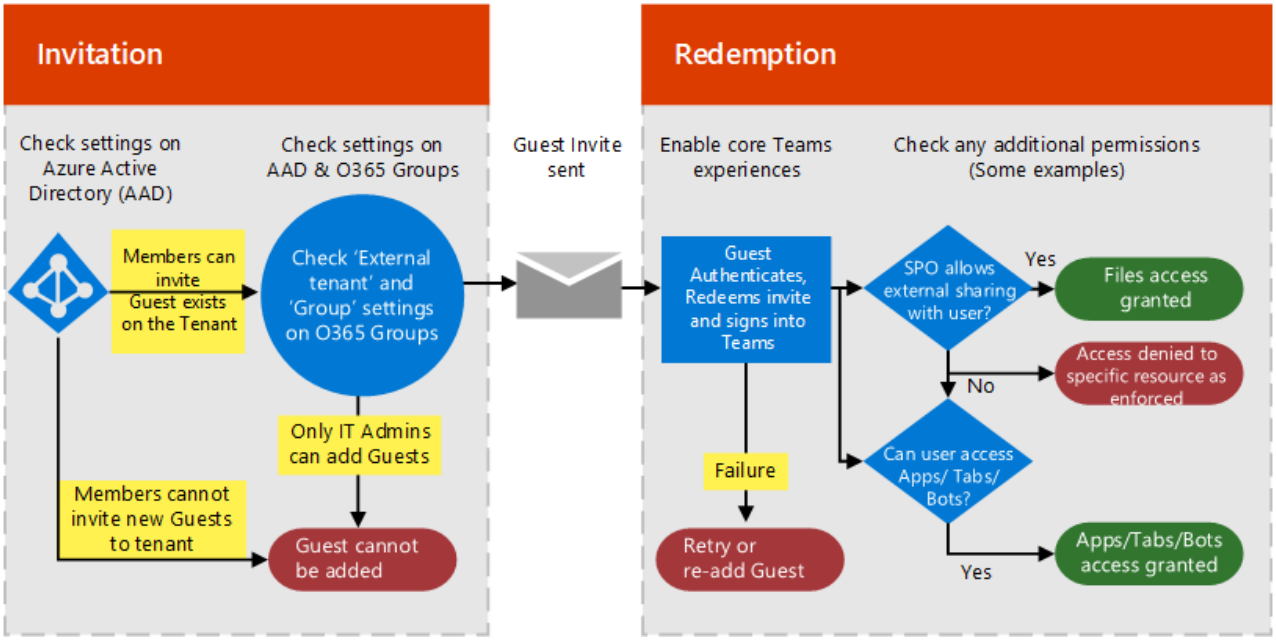
For end-to-end guest access configuration instructions, see Collaborate with guests in a team.

> **NOTE**
>
> Guests are subject to the service limits described in Microsoft 365 and Office 365 service descriptions and Limitations of Azure AD B2B collaboration.

The following diagram shows how guest access authorization dependency is granted and integrated between Azure Active Directory, Teams, and Microsoft 365.



The next diagram shows, at a high level, how the user experience works with the permission model through a typical guest access invitation and redemption flow.



It's important to note here that apps, bots, and connectors might require their own set of permissions and/or consent specific to the user account. These might need to be granted separately. Similarly, SharePoint might impose extra external sharing boundaries for a specific user, groups of users, or even at the site level.

The previous two diagrams are also available in Visio.

Control guest access in Azure Active Directory

Use Azure AD to determine whether external collaborators can be invited into your tenant as guests, and in what ways. For more information about Azure B2B guest access, see What is guest user access in Azure Active Directory B2B. For information about Azure AD roles, see Grant permissions to users from partner organizations in your Azure Active Directory tenant.

The settings for invitations apply at the organization level and control the guest experience at the directory and application level. You can configure these settings in External collaboration settings.

Azure AD includes the following settings to configure external users:

- Guest user access restrictions
- **Admins and users in the guest inviter role can invite**: **Yes** means that admins and users in the guest inviter role will be able to invite guests to the tenant. **No** means admins and users can't invite guests to the tenant.
- **Members can invite**: To allow non-admin members of your directory to invite guests, set this policy to **Yes** (recommended). If you prefer that only admins be able to add guests, you can set this policy to **No**. Keep in mind that setting **No** will limit the guest experience for non-admin teams owners; they'll only be able to add guests in Teams that have already been added in AAD by the admin.
- **Guests can invite**: **Yes** means that guests in your directory can invite other guests to collaborate on resources secured by your Azure AD, such as SharePoint sites or Azure resources. **No** means that guests can't invite other guests to collaborate with your organization. Even if set to **Yes**, guest cannot invite other guests in Teams.

For more information about controlling who can invite guests, see Enable B2B external collaboration and manage who can invite guests.

> **NOTE**
>
> You can also manage which domains can be invited into your tenant as guests. See Allow or block invitations to B2B users from specific organizations.

Adding the user guest account manually to Azure AD B2B is not required, as the account will be added to the directory automatically when you add the guest to Teams.

Licensing for guest access

Guest access licensing uses Azure AD External Identities pricing and is based on monthly active guests. See Billing model for Azure AD External Identities for details.

> **NOTE**
>
> Users in your organization who have standalone Office 365 subscription plans only, such as Exchange Online Plan 2, cannot be invited as guests to your organization because Teams considers these users to belong to the same organization. For these users to use Teams, they must be assigned an Microsoft 365 Business Standard, Office 365 Enterprise, or Office 365 Education subscription.

External access (federation) vs. guest access

External access (federation) and guest access are different:

- External access gives access permission to an entire domain.
- Guest access gives access permission to an individual.

For a detailed comparison, see Communicate with users from other organizations.

Related topics

- Microsoft 365 guest sharing settings reference

Set up secure collaboration with Microsoft 365

Turn on or turn off guest access to Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

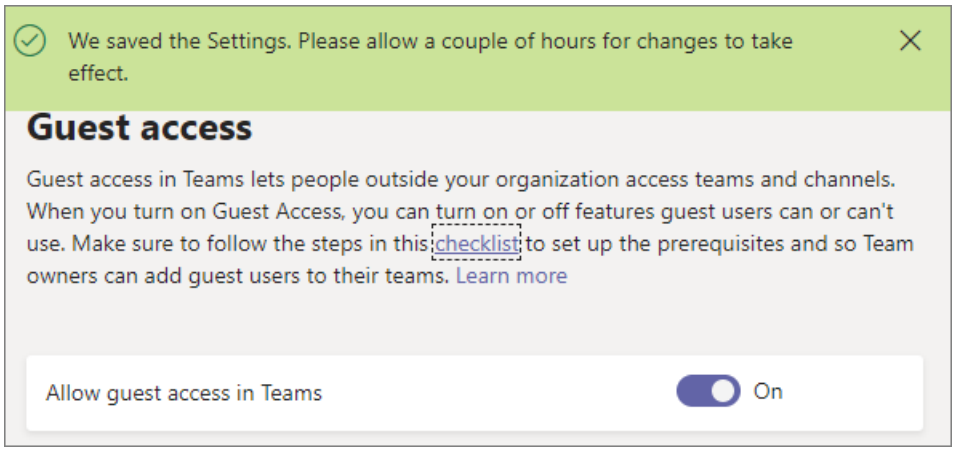
By default, guest access is turned off. You must turn on guest access for Teams before admins or team owners can add guests.

After you turn on guest access, it may take a few hours for the changes to take effect. If a user sees the message "Contact your administrator" when they try to add a guest to their team, it's likely that either guest access hasn't been turned on or the settings aren't effective yet.

> **IMPORTANT**
> Turning on guest access depends on settings in Azure Active Directory, Microsoft 365, SharePoint, and Teams. For more information, see Collaborate with guests in a team.

Configure guest access in the Teams admin center

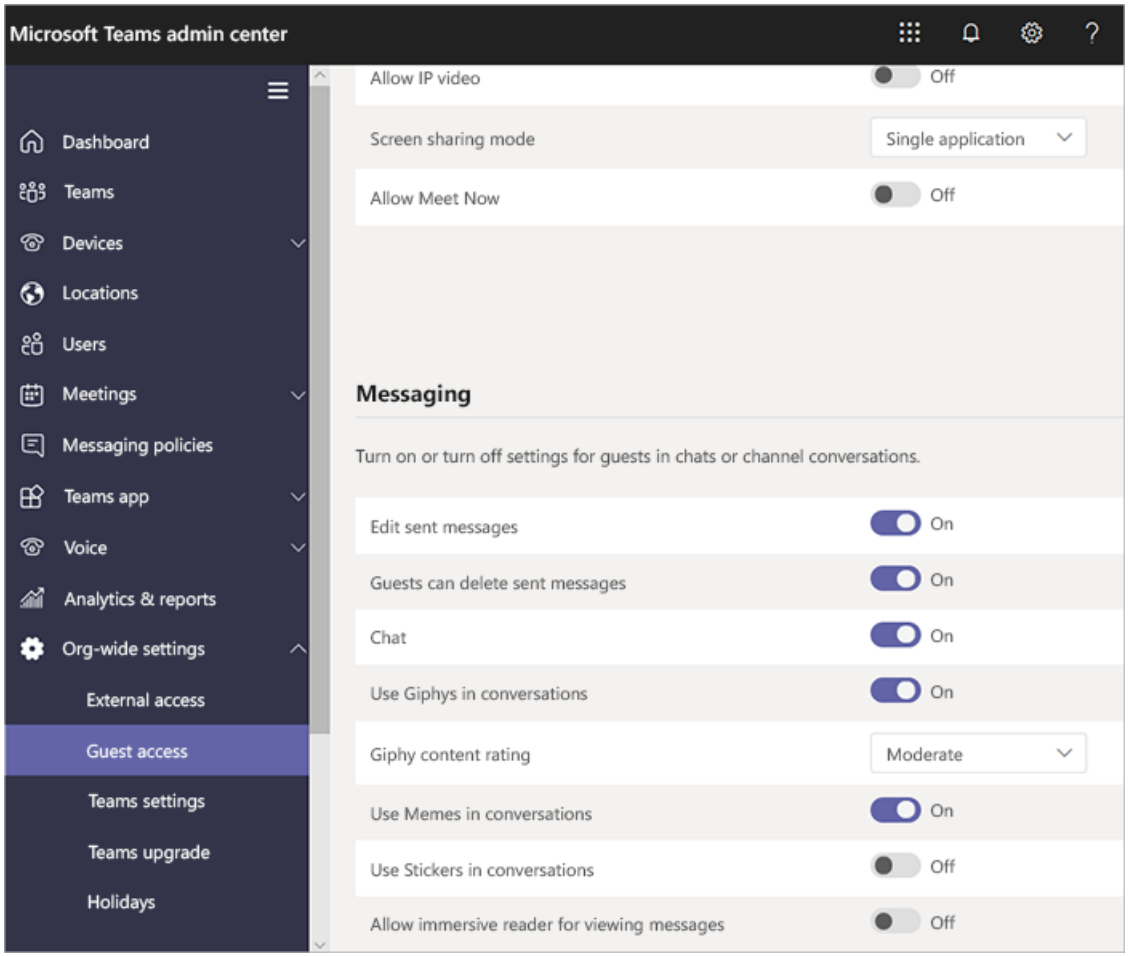
1. Sign in to the Microsoft Teams admin center.
2. Select **Org-wide settings** > **Guest access**.
3. Set **Allow guest access in Microsoft Teams** to **On**.



4. Under **Calling**, **Meeting**, and **Messaging**, select **On** or **Off** for each capability, depending on what you want to allow for guest users.

   - **Make private calls** – Turn this setting **On** to allow guests to make peer-to-peer calls.
   - **Allow IP video** - Turn this setting **On** to allow guests to use video in their calls and meetings.
   - **Screen sharing mode** – This setting controls the availability of screen sharing for guest users.
     - Turn this setting to **Disabled** to remove the ability for guests to share their screens in Teams.
     - Turn this setting to **Single application** to allow sharing of individual applications.
     - Turn this setting to **Entire screen** to allow complete screen sharing.
   - **Allow Meet Now** – Turn this setting **On** to allow guests to use the Meet Now feature in Microsoft Teams.
   - **Edit sent messages** - Turn this setting **On** to allow guests to edit messages they previously sent.
   - **Guests can delete sent messages** – Turn this setting **On** to allow guests to delete messages they previously sent.
   - **Chat** – Turn this setting **On** to give guests the ability to use chat in Teams.

- **Use Giphys in conversations** – Turn this setting **On** to allow guests to use Giphys in conversations. Giphy is an online database and search engine that allows users to search for and share animated GIF files. Each Giphy is assigned a content rating.
- **Giphy content rating** – Select a rating from the drop-down list:
  - **Allow all content** - Guests will be able to insert all Giphys in chats, regardless of the content rating.
  - **Moderate** - Guests will be able to insert Giphys in chats, but will be moderately restricted from adult content.
  - **Strict** – Guests will be able to insert Giphys in chats, but will be restricted from inserting adult content.
- **Use memes in conversations** - Turn this setting **On** to allow guests to use Memes in conversations.
- **Use Stickers in conversations** – Turn this setting **On** to allow guests to use stickers in conversations.



5. Click **Save**.

External access (federation) vs. guest access

External access (federation) and guest access are different:

- External access gives access permission to an entire domain.
- Guest access gives access permission to an individual.

For a detailed comparison, see Communicate with users from other organizations.

See also

Set up secure collaboration with Microsoft 365

Block guest users from a specific team

Set-CsTeamsClientConfiguration

Add a guest to a team

12/5/2020 • 2 minutes to read • Edit Online

Anyone with a business or consumer email account, such as Outlook, Gmail, or others, can participate as a guest in Teams.

As an admin, you can add a new guest user to the organization in a couple of ways:

- Global admins or Teams admins and team owners add a guest to a team in the Teams clients or in the Teams admin center. To learn more, read Add guests to a team. If you haven't set up guest access yet, go through the steps in the Collaborate with guests in a team.
- Add guests to your organization through Azure Active Directory (Azure AD) B2B collaboration. For details, check out Quickstart: Add guest users to your directory in the Azure portal.

Admins can also delegate permissions to add guests to others in their organization by assigning the Guest Inviter role. For more information, see Enable B2B external collaboration and manage who can invite guests.

With Azure AD B2B collaboration, organizations can enforce conditional access and multi-factor authentication (MFA) policies for B2B users. These policies can be enforced at the tenant, app, or individual user level, the same way that they are enabled for full-time employees and members of the organization. Such policies are enforced at the resource organization. For more information, see Conditional access for B2B collaboration users. Individual guest users can't be blocked.

Guest users you have already added via Azure AD B2B, Microsoft 365 Groups, or SharePoint are ready to go. The Microsoft 365 admin or a team owner can add those guests to their respective teams. If add a guest directly to the Microsoft 365 group associated with a team, the guest will get access to the team but the Microsoft 365 group doesn't generate an invitation email to the guest, so someone on the team should notify the guest.

> **NOTE**
> Guests are subject to Microsoft 365 or Office 365 and Azure Active Directory service limits.

You can track guest additions in Azure AD or the Microsoft 365 security center. Adding a guest in Microsoft Teams is audited and logged as an Azure AD group administration activity "Added member to group". For more details, see Auditing and reporting a B2B collaboration user and Search the audit log in the compliance Center.

Related topics

Authorize guest access in Microsoft Teams

Turn on or off guest access in Microsoft Teams

View guest users in a team

12/5/2020 • 2 minutes to read • Edit Online

Anyone in a team can see all members of a team, including guests, via **Manage team** in Microsoft Teams. Refer to See who's on a team or in a channel for more details.

To identify guest users:

1. Sign in to the Microsoft 365 admin center.
2. Select **Admin centers** > **Teams**.
3. In the Teams admin center, select **Users**. You will see **guest** appended to the display name of any guest users.

You can also identify guest users from within a team that you own.

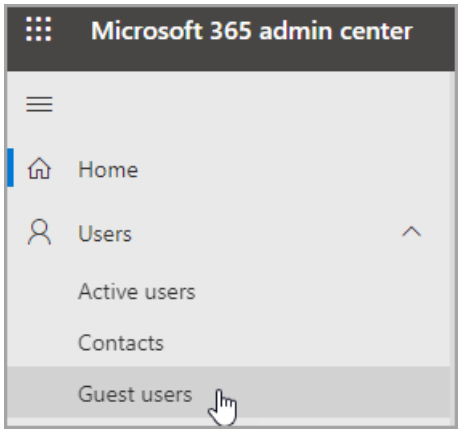
Edit guest user information

12/5/2020 • 2 minutes to read • Edit Online

You can edit guest information from the Microsoft 365 admin center or the Azure Directory portal.

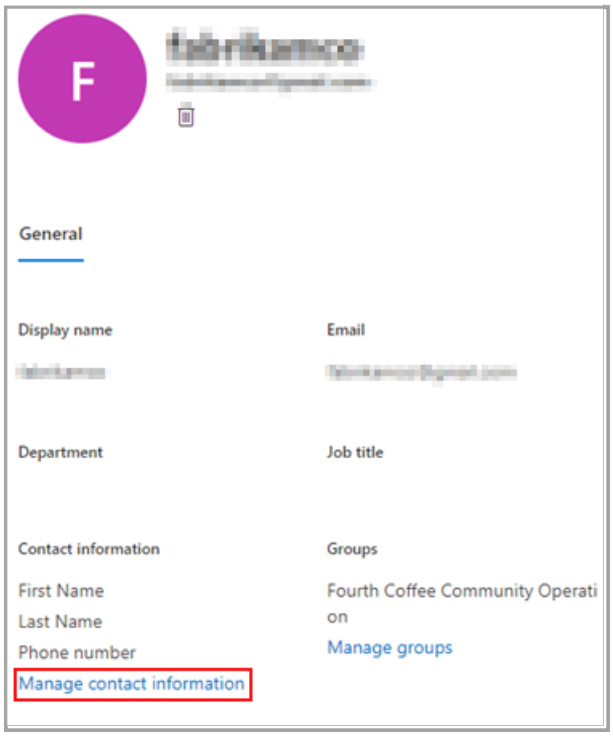
Guest users in the Microsoft 365 admin

1. To edit the guest information in the Microsoft 365 admin center, select **Users** > **Guest Users**.



2. Select a user from **Guest users**.

3. In guest user information, select **Manage contact information**.



4. Edit any fields that you choose except for **Display name** in **Manage contact information**, and then select **Save changes**.



You can also edit the guest user from the Azure Active Directory portal.

Troubleshoot problems with guest access in Microsoft Teams

10/3/2020 • 2 minutes to read • Edit Online

- To see whether we know about your problem, check out Support Teams in your organization.
- To check for current support issues with guest access in Teams, go to Teams Troubleshooting.
- Guests are people outside your organization. If someone is inside your organization (including your employees, onsite contractors, or onsite agents), they can't be added as guests. The same applies to your affiliates.
- Find out about upcoming new or updated guest access features in the Teams Roadmap.
- Tell us what you want in Teams UserVoice.

If your guests are seeing license errors

Guest access in Teams uses Azure Active Directory (Azure AD) Business to Business (B2B) and its licensing model. Guest access is included with all Microsoft 365 Business Standard, Office 365 Enterprise, and Office 365 Education subscriptions. No additional Microsoft 365 or Office 365 license is necessary.

> **NOTE**
> Teams must be enabled on a guest's home tenant for guests to be able to sign in and use Teams as a guest on another (resource) tenant.

If you're seeing licensing errors, make sure to read the Billing model for Azure AD External Identities to determine licensing requirements to meet your needs for guest access in your organization.

- Guest licenses are counted against the inviting organization. Consider this when you calculate the number of licenses you need.
- Licenses are counted against your organization whether the invited guests come from another Microsoft 365 organization or are using their personal email addresses.

Support for B2B User types

Currently Teams only has support for State 1 and State 2 types of Guest users as defined by Azure B2B.

Related topics

Guest access in Teams

Teams Troubleshooting

Cortana voice assistance in Teams

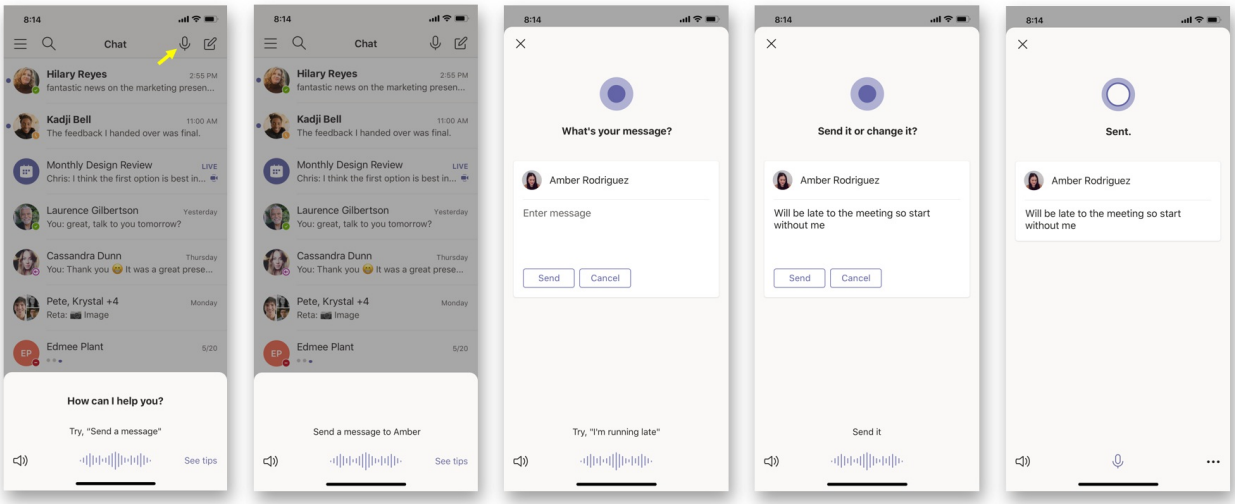
11/2/2020 • 3 minutes to read • Edit Online

NOTE

Cortana voice assistance is supported in Microsoft Teams iOS and Android mobile apps, and on Microsoft Teams displays, only for users in the United States. It isn't currently available for GCC, GCC-High, DoD, EDU tenants. Expansion to additional languages and regions will happen as part of future releases.

Cortana voice assistance in the Teams mobile app and on Microsoft Teams display devices enables Microsoft 365 Enterprise users to streamline communication, collaboration, and meeting-related tasks using spoken natural language. Users can speak to Cortana by selecting the microphone button located in the upper right of the Teams mobile app, or by saying "Cortana" in the Microsoft Teams display. To quickly connect with their team hands-free and while on the go, users can say queries such as "call Megan" or "send a message to my next meeting". Users can also join meetings by saying "join my next meeting" and use voice assistance to share files, check their calendar, and more. These voice assistance experiences are delivered using Cortana enterprise-grade services that fully comply with Office 365's privacy, security, and compliance promises as reflected in the Online Services Terms (OST).

The image shows sending a chat using Cortana on a mobile device.



Admin control and limitations

Cortana voice assistance in Teams is delivered using services that fully comply with the Office 365 enterprise-level privacy, security, and compliance promises as reflected in the Online Services Terms (OST). The feature will be enabled by default for tenants.

Tenant admins can control who in their tenant can use Cortana voice assistance in Teams using a policy (TeamsCortanaPolicy). This policy can be set at either a user account level or tenant level. Admins can use the CortanaVoiceInvocationMode field within this policy control to determine whether Cortana is disabled, enabled with push button invocation only, or with wake word invocation as well (applicable to devices that support it, like the Microsoft Teams display).

Admins can use the following PowerShell cmdlets to manage this policy (the policy is currently not available in Microsoft Teams admin center).

- New-CsTeamsCortanaPolicy

- Get-CsTeamsCortanaPolicy
- Grant-CsTeamsCortanaPolicy
- Set-CsTeamsCortanaPolicy
- Remove-CsTeamsCortanaPolicy

For example, the command below creates a new policy with name "EmployeeCortanaPolicy" where Cortana voice assistance in Microsoft Teams is disabled.

```
PS C:\> New-CsTeamsCortanaPolicy -Identity EmployeeCortanaPolicy -CortanaVoiceInvocationMode Disabled
```

This example shows updating an existing policy with name "EmployeeCortanaPolicy" and enabling Cortana voice assistance in Microsoft Teams with push button invocation only. Users will be able to invoke Cortana by selecting the Cortana mic button in Teams. Wake word ("Hey Cortana" or "Cortana") invocation will be disabled.

```
PS C:\> Set-CsTeamsCortanaPolicy -Identity EmployeeCortanaPolicy -CortanaVoiceInvocationMode
PushToTalkUserOverride
```

This example shows updating the policy and enabling Cortana voice assistance with both push button and wake word invocation.

```
PS C:\> Set-CsTeamsCortanaPolicy -Identity EmployeeCortanaPolicy -CortanaVoiceInvocationMode
WakeWordPushToTalkUserOverride
```

> **NOTE**
> At the time of the initial release for Microsoft 365 Enterprise users in the US in English, the Teams mobile app will not support wake word activation, but it will be supported in the future. Wake word activation will work on Microsoft Teams display devices at initial release.

User control

Individual users can try out Cortana voice assistance in the Teams mobile app by selecting the microphone button. They can try out Cortana voice assistance on Microsoft Teams display devices by simply saying "Cortana." They can also control whether Cortana in Teams is enabled for their device using a setting in the Teams mobile app or on the Microsoft Teams display.

1. Open the Teams mobile app, or go to the ambient (home) screen of the Microsoft Teams display.
2. In the Teams mobile app, go to **Settings**. On the Microsoft Teams display, select the user avatar, and then select Settings. If Cortana is enabled, say, "Cortana, go to Settings."
3. Select **Cortana**.
4. Move the toggle to **On** or **Off**, depending on whether you want Cortana voice assistance on the device.

Use Microsoft Teams administrator roles to manage Teams

10/5/2020 • 4 minutes to read • Edit Online

Using Azure Active Directory (Azure AD), you can designate administrators who need different levels of access for managing Microsoft Teams. Administrators can manage the entire Teams workload, or they can have delegated permissions for troubleshooting call quality problems or managing your organization's telephony needs.

Teams roles and capabilities

There are several Teams admin roles available: Teams service administrator, Teams communications administrator, Teams communications support specialist, Teams communications support engineer, and Teams Device Administrator. Review the following table to understand what each role can do and which tools the admin can use in the Microsoft Teams admin center and PowerShell.

To follow along, you must be an admin. The instructions for getting the permissions are in this article.

ROLE	CAN DO THESE TASKS	CAN ACCESS THE FOLLOWING TOOLS

ROLE	CAN DO THESE TASKS	CAN ACCESS THE FOLLOWING TOOLS
Teams Service Administrator	Manage the Teams service, and manage and create Microsoft 365 Groups.	Everything in the Microsoft Teams admin center and associated PowerShell controls, including: • Manage meetings, including meeting policies, configurations, and conference bridges.[1,3] • Manage voice, including calling policies and phone number inventory and assignment.[1] • Manage messaging, including messaging policies.[1,3] • Manage all org-wide settings, including federation, teams upgrade, and teams client settings.[1,3] • Manage the teams in the organization and their associated settings, including membership (group management supported via PowerShell, team management in the Teams admin center).[2,3] • Manage Teams-certified devices and set up and assign configuration policies.[2] • View user profile page and troubleshoot user call quality problems using advanced troubleshooting toolset.[3] • Access all reports in the Microsoft Teams admin center • Access, monitor and troubleshoot tenant's call quality and reliability using data exposed in Call Quality Dashboard (CQD) down to the users impacted by poor call quality. Create new call quality reports, update and remove call quality reports as needed. Upload and update CQD building data. • Publish apps to the tenant app catalog in the Microsoft Teams admin center

ROLE	CAN DO THESE TASKS	CAN ACCESS THE FOLLOWING TOOLS
Teams Communications Administrator	Manage calling and meetings features within the Teams service.	Manage meetings, including meeting policies, configurations, and conference bridges.[1,3] Manage voice, including calling policies and phone number inventory and assignment.[1] View user profile page and troubleshoot user call quality problems using the advanced troubleshooting toolset.[3] Access, monitor, and troubleshoot tenant's call quality and reliability using data exposed in Call Quality Dashboard (CQD) down to the users who are impacted by poor call quality. Create new call quality reports, update and remove call quality reports as needed. Upload and update CQD building data.
Teams Communications Support Engineer	Troubleshoot communications issues within Teams by using **advanced** tools.	View user profile page and troubleshoot user call quality problems using advanced troubleshooting toolset.[3] Access, monitor, and troubleshoot tenant's call quality and reliability using data exposed in Call Quality Dashboard (CQD) down to the users who are impacted by poor call quality.
Teams Communications Support Specialist	Troubleshoot communications issues within Teams by using **basic** tools.	Access user profile page for troubleshooting calls in Call Analytics. Can only view user information for the specific user being searched for.[3] Access, monitor, and troubleshoot tenant's call quality and reliability using data exposed in Call Quality Dashboard (CQD).
Teams Device Administrator	Manage devices configured for use with the Teams service.	Manage device configuration and updates, review device health and status of connected peripherals, set up and apply configuration profiles, and restart devices. The Teams Device Administrator role doesn't provide access to call quality data or call analytics. To view call quality data or call analytics, you need to be assigned the Teams Communications Administrator role.

[1] PowerShell - Skype for Business module

[2] PowerShell - Microsoft Teams module

[3] Microsoft Teams admin center

For more information about the admin tools available for managing Microsoft Teams, see Managing Microsoft Teams.

For more information about limits, specifications, and other requirements that apply to Teams, see Limits and specifications for Microsoft Teams.

Assign users to each role

You can assign users to these roles in Azure AD. To learn how to assign administrative roles to a user in Azure AD, see Assign a user to administrator roles in Azure Active Directory.

Cmdlets available for each role

Most of the PowerShell tools for these admin roles live in the Skype for Business PowerShell module, and it's important to note that some of the cmdlets that these admin roles have access to control shared settings that are also used for Skype for Business Online. The Skype for Business admin role also has access to all the cmdlets in the Skype for Business PowerShell module.

To view the full list of cmdlets currently available to a given role in the Skype for Business PowerShell module, follow these steps:

1. Assign that role to a user (and make sure that the user has no other roles).
2. Connect to the Skype for Business PowerShell module:
   a. $session = new-csonlinesession
   b. Import-pssession $session
   c. Use **Get-Module** to identify the name of the imported session (it will be a randomly generated name).
3. Use **Get-Command -Module** <*name from above*> to identify all available cmdlets

Related topics

- Microsoft Teams PowerShell Overview
- Microsoft Teams PowerShell
- Assign team owners and members in Microsoft Teams

Manage Microsoft Teams settings for your organization

11/2/2020 • 5 minutes to read • Edit Online

Teams apps settings in the Microsoft Teams admin center

You manage apps for your organization in **Teams apps** in the Microsoft Teams admin center. For example, you can set policies to control what apps are available org-wide or to specific Teams users and you can customize Teams by pinning the apps that are most important for your users.

To learn more, see Admin settings for apps in Teams.

Teams org-wide settings in the Microsoft Teams admin center

You can control organization-wide user settings in the Microsoft Teams admin center. To edit org-wide settings, go to the Microsoft Teams admin center, and then select **Org-wide settings**. You can configure the following settings.

External access

External access lets your Teams and Skype for Business users communicate with users who are outside of your organization or domain. To configure external access, go to Let your Teams users chat and communicate with users in another Teams organization.

To add or block a domain:

1. Select **Add a domain**.
2. In the Add a domain pane, enter the domain name, and click the space bar to save the name.
3. Select **Allowed** or **Blocked**.
4. Select **Done** to save your changes.

Guest access

Guest access in Microsoft Teams allows teams in your organization to collaborate with people outside your organization by granting them access to teams and channels. Anyone with a business or consumer email account, such as Outlook, Gmail, or others, can participate as a guest in Teams with full access to team chats, meetings, and files. For more information, see Guest access in Microsoft Teams.

Teams settings

In **Teams settings**, you can set up features for teams including notifications and feeds, email integration, cloud storage options, and devices.

Notifications and feeds

Here you can control whether suggested feeds appear in users' activity feed in Teams. To learn more about the activity feed, see Explore the Activity feed in Teams.

Tagging

Tags let users communicate with a subset of people on a team. Tags can be added to one or more team members. After a tag is added, it can be used in @mentions by anyone on the team in a channel post to communicate with only those people who are assigned that tag. Use these settings to control who can add tags and how tags are used across your organization. To learn more, see Manage tags in Teams.

Email integration

Turn on this feature so users can send email to a channel in Teams, using the channel email address. Users can do this for any channel belonging to a team they own. Users can also send emails to any channel in a team that has adding connectors turned on for team members. To turn on email integration, make sure that **Allow users to send emails to a channel email address** is **On**.

Files

Here you can turn on or turn off file sharing and cloud file storage options.

Users can upload and share files from cloud storage services in Teams channels and chats. Cloud storage options in Teams currently include Dropbox, Box, ShareFile, Google Drive, and Egnyte. Turn on the switch for the cloud storage providers that your organization wants to use.

Organization

Here you can turn on the **Organization** tab, which shows the detailed organizational chart for the user's organization. For more information, see Use the organization tab in Teams.

Devices

These settings control resource account behavior for Surface Hub devices attending Microsoft Teams meetings. Use these settings to configure authentication requirements, require a content PIN, and turn on Surface Hub resource accounts to send messages.

- **Require a secondary form of authentication to access meeting content** – Select the level of access that users have when they enter the content PIN.
- **Set content PIN** – Require users to enter this PIN to prevent unauthorized access to documents. This prevents an unauthorized user from joining upcoming meetings and browsing attachments.
- **Resource accounts can send messages** – Turn this setting **On** to allow messages to be sent from the Surface Hub resource account.

Search by name

Microsoft Teams scoped directory search uses Exchange address book policy (APB) to allow organizations to create virtual boundaries that control how users can find and communicate with other users in their organization. You might want to use a scoped directory search in situations like these:

- Your organization has multiple companies within its tenant that you want to keep separate.
- Your school wants to limit chats between faculty and students.

Switch this setting **On** to turn on scoped directory searches.

Skype for Business

Use this page to manage Skype for Business features for Skype for Business users in your organization. To learn more, see Manage Skype for Business settings in the Microsoft Teams admin center.

Teams upgrade

You can use these settings to configure how your users will be upgraded from Skype for Business to Microsoft Teams.

Coexistence mode

You can specify a coexistence mode:

- **Teams only**
- **Islands** (Teams and Skype for Business will coexist)
- **Skype for Business only**
- **Skype for Business with Teams collaboration** (Users receive chats and calls and schedule meetings in Skype for Business but use Teams for group collaboration)
- **Skype for Business with Teams collaboration and meetings** (Users receive chats and calls in Skype for Business but use Teams for group collaboration and to schedule meetings)

The coexistence mode you choose determines the routing of incoming calls and chats and the app that is used by the user to initiate chats and calls or to schedule meetings. For more information about coexistence modes, go to Understand Microsoft Teams and Skype for Business coexistence and interoperability.

App preferences

Here you can choose the app that users will use to join Skype for Business meetings (Skype for Business or the Skype Meetings App). This setting isn't dependent on the coexistence mode setting.

Network Planner

Network Planner helps you determine and organize network requirements for connecting Teams users across your organization. Learn how to Use the Network Planner for Microsoft Teams.

You can also select the "Download the Teams app in the background for Skype for Business users" option as well. By default this setting is set to On. With this setting enabled it will download the Teams app in the background for users running the Skype for Business app on Windows PCs. This happens if the Coexistence mode for the user is Teams Only, or if a pending upgrade notification is enabled in the Skype for Business app.

How can I tell which features are available?

See the Microsoft 365 Roadmap for information about new Teams features. For more information about new and upcoming features, see the Teams What's New page and the Tech Community Microsoft Teams blog for Teams.

More information

For information about which roles can perform admin functions, see Use Microsoft Teams admin roles to manage Teams.

Manage Teams during the transition to the new Microsoft Teams admin center

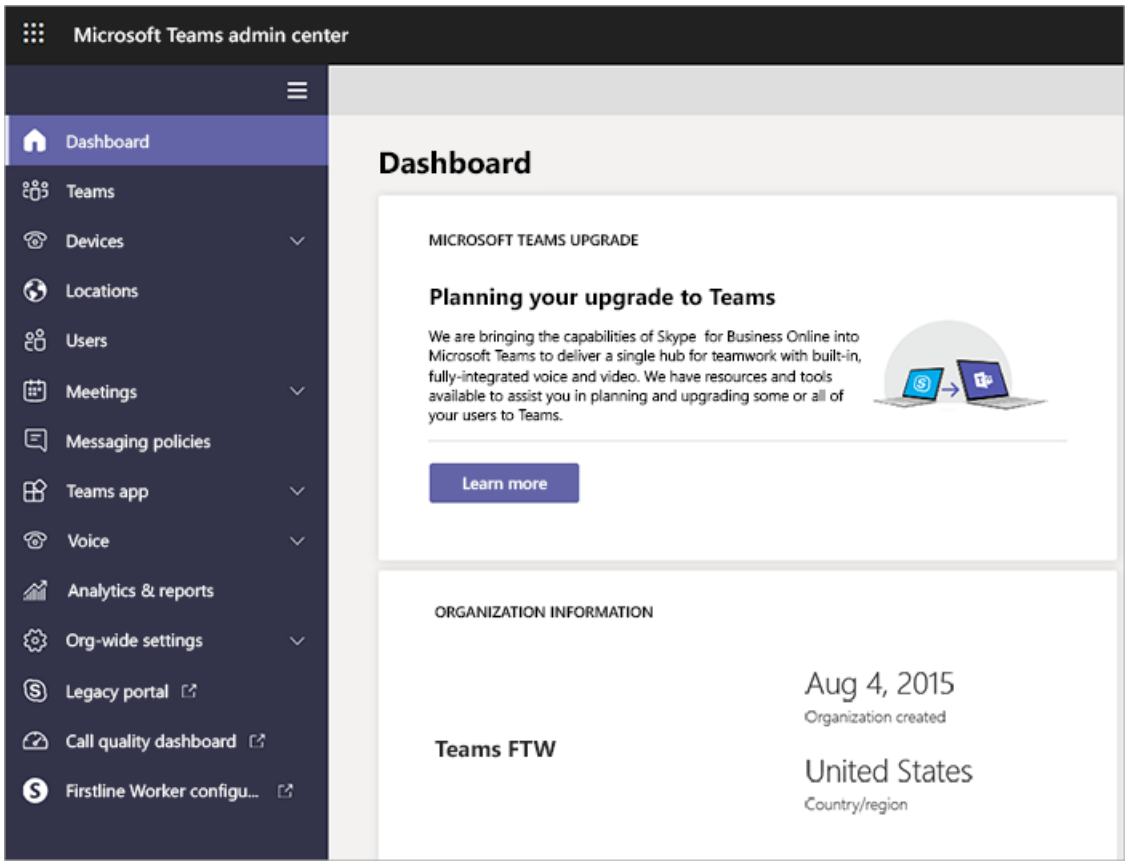
11/2/2020 • 3 minutes to read • Edit Online

IMPORTANT

The Microsoft Teams admin center is gradually replacing the Skype for Business admin center, and we're migrating Teams settings to it from the Microsoft 365 admin center. If a setting has been migrated, you'll see a notification and then be directed to the setting's location in the Teams admin center. For more information, see Manage Teams during the transition to the Teams admin center.

What is the new Microsoft Teams admin center

The new admin center experience will provide you with a unified experience to manage both Teams and Skype for Business. We're delivering additional functionality, end-to-end insights, and the ability to manage Teams settings on a user level.



Settings migrated to the new Microsoft Teams admin center

The following table identifies the sections of the Teams experience that have been migrated and shows the relationship between the current settings and the policies in the new admin portal.

SECTION OF TEAMS IN MICROSOFT 365 ADMIN CENTER	SETTING NAME (TENANT LEVEL)	MICROSOFT TEAMS ADMIN CENTER POLICY	LEVEL: TENANT OR USER
General	Show organizational chart in personal profile	TeamsClientConfiguration	Tenant
General	Use Skype for Business for recipients who don't have Teams	TeamsClientConfiguration	Tenant
Email integration	Allow users to send emails to channels	TeamsClientConfiguration	Tenant
Email integration	Allow senders list	TeamsClientConfiguration	Tenant
Custom cloud storage	Box	TeamsClientConfiguration	Tenant
Custom cloud storage	Dropbox	TeamsClientConfiguration	Tenant
Custom cloud storage	Egnyte	TeamsClientConfiguration	Tenant
Custom cloud storage	Google Drive	TeamsClientConfiguration	Tenant
Custom cloud storage	ShareFile	TeamsClientConfiguration	Tenant
Settings by user/license type	Turn Microsoft Teams on or off for all users	Deprecated[1]	
Teams and channels		Redirects to Azure Active Directory Group Management (same as current experience).	User
Teams and channels		Redirects to AAD Group Management (same as current experience).	User
Apps	Enable new external apps by default	Org-wide app settings	Tenant
Apps	Allow external apps	Org-wide app settings	Tenant
Apps	Allow sideloading of external apps[2]	TeamsAppSetupPolicy	User
Apps	Default apps[3]	TeamsAppPermissionPolicy	User
Apps	External apps[3]	TeamsAppPermissionPolicy	User
Calls and Meetings	Allow scheduling for private meetings	TeamsMeetingPolicy	User
Calls and Meetings	Allow Ad-hoc channel meetup	TeamsMeetingPolicy	User

SECTION OF TEAMS IN MICROSOFT 365 ADMIN CENTER	SETTING NAME (TENANT LEVEL)	MICROSOFT TEAMS ADMIN CENTER POLICY	LEVEL: TENANT OR USER
Calls and Meetings	Allow scheduling for channel meetings	TeamsMeetingPolicy	User
Calls and Meetings	Allow videos in meetings	TeamsMeetingPolicy	User
Calls and Meetings	Allow screen sharing in meetings	TeamsMeetingPolicy	User
Calls and Meetings	Allow private calling	TeamsCallingPolicy	User
Messaging	Enable Giphy so users can add GIFs to conversations	TeamsMessagingPolicy	User
Messaging	Content rating	TeamsMessagingPolicy	User
Messaging	Enable memes that users can edit and add to conversations	TeamsMessagingPolicy	User
Messaging	Enable stickers that users can edit and add to conversations	TeamsMessagingPolicy	User
Messaging	Allow owners to delete all messages	TeamsMessagingPolicy	User
Messaging	Allow users to edit their own messages	TeamsMessagingPolicy	User
Messaging	Allow users to delete their own messages	TeamsMessagingPolicy	User
Messaging	Allows users to chat privately	TeamsMessagingPolicy	User

[1] Deprecated for Guest. Enabling/disabling Guest can now be managed in the Microsoft Teams admin center. Enabling/disabling Teams for Business Enterprise, Edu Student, and Edu Faculty will be deprecated soon. This should be managed by assigning licenses in the Microsoft 365 admin center. See Manage user access to Microsoft Teams.

[2] Sideloading is split as follows:

- Allow a user to sideload apps which can be managed at a user level in TeamsAppSetupPolicy.
- Allow users in a tenant to interact with custom apps which can be managed at a tenant level in org-wide app settings.

[3] Default apps and external apps can be enabled and disabled at the user level in TeamsAppPermissionPolicy. Additionally, apps can be blocked at the tenant level in org-wide app settings which overrides any user and tenant-level settings.

> **NOTE**
>
> You'll continue to use the Groups dashboard in the Microsoft 365 admin center for configuration related to Teams and channels. Settings for Apps will remain in the Teams area of the Microsoft 365 admin center and will be migrated later.

Manage settings during the migration

You can continue to modify settings in the Microsoft 365 admin center and the Skype for Business admin center until migration for a section is complete for your tenant.

The following table shows where you can manage features during the migration.

FEATURE	MICROSOFT TEAMS ADMIN CENTER	SKYPE FOR BUSINESS ADMIN CENTER (LEGACY)	MICROSOFT 365 ADMIN CENTER
Teams Messaging, Meetings, and Live Events policies	X		
Teams Upgrade policy	X		
Guest settings for Messaging, Meetings, and Voice	X		
Teams Lifecycle Management	X		
Teams Settings	X		
External access settings	X		
User management			X
Audio conferencing	X	X	
Calling plans	X	X	
Phone System	X	X	
Phone number management	X	X	
Licensing for Cloud voice features			X
Auto attendants	X		
Call queues	X		

Manage settings after the migration

When the migration of these settings is complete, we'll disable them in the Microsoft 365 admin center and the Skype for Business admin center, and they can then be managed in the new Microsoft Teams admin center.

Manage teams in the Microsoft Teams admin center

9/15/2020 • 4 minutes to read • Edit Online

Overview

This article provides an overview of the management tools for Teams in the Microsoft Teams admin center.

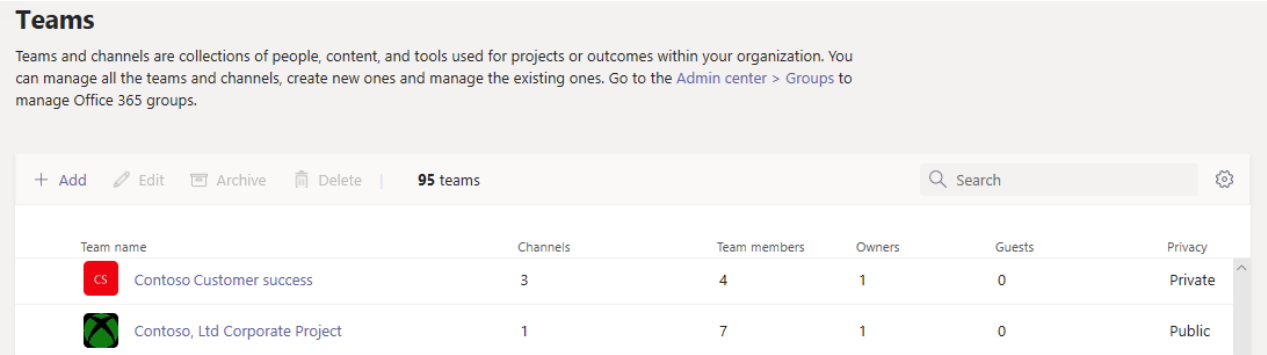
As an admin, you may need to view or update the teams that your organization set up for collaboration, or you might need to perform remediation actions such as assigning owners for ownerless teams. You can manage the teams used in your organization through both the Microsoft Teams PowerShell module and the Microsoft Teams admin center. You can access the admin center at https://admin.microsoft.com. For full administration capabilities using these two toolsets, you should make sure that you are assigned one of the following roles:

- Global Administrator
- Teams Service Administrator

You can learn more about admin roles in Teams in Use Microsoft Teams admin roles to manage Teams, and you can read more about how to use the PowerShell cmdlets for managing teams in the Microsoft Teams cmdlet reference.

Teams overview grid

Management tools for teams are under the **Teams** node in the Microsoft Teams admin center. (In the admin center, select **Teams** > **Manage teams**.) Each team is backed by a Microsoft 365 Group, and this node provides a view of groups that have been Microsoft Teams-enabled in your organization.



The grid displays the following properties:

- **Team name**
- **Channels** - a count of all channels in the team, including the default General channel.
- **Team members** - a count of total users, including owners, guests, and members from your tenant.
- **Owners** - a count of owners for this team.
- **Guests** - a count of Azure Active Directory B2B guest users who are members of this team.
- **Privacy** - the Visibility/AccessType of the backing Microsoft 365 group.
- **Status** - the Archived or Active status for this team. Learn more about archiving teams in Archive or restore a team.
- **Description** - the description of the backing Microsoft 365 group.
- **Classification** - the classification (if used in your organization) assigned to the backing Microsoft 365 group. Learn more about classifications at Create classifications for Office groups in your organization.
- **GroupID** - the unique GroupID of the backing Microsoft 365 group.

> **NOTE**
>
> If you don't see all these properties in the grid, click the **Edit columns** icon. In the **Edit columns** pane, you can use the toggles to turn on or turn off columns in the grid. When you're finished, click **Apply**.

Add

To add a new team, click **Add**. In the **Add a new team** pane, give the team a name and description, set whether you want to make it a private or public team, and set the classification.

> **NOTE**
>
> Newly created teams can be managed right away in the Teams Admin Center, unlike the experience in other clients like, Outlook.

Edit

To edit group and team-specific settings, select the team by clicking to the left of the team name, and then select **Edit**.

Archive

You can archive a team. Archiving a team puts the team into read-only mode within Teams. As an admin, you can archive and un-archive teams on behalf of your organization in the admin center.

Delete

Deleting a team is a soft-delete of the team and corresponding Microsoft 365 group. To restore a mistakenly deleted team, follow the instructions in Restore a deleted Group.

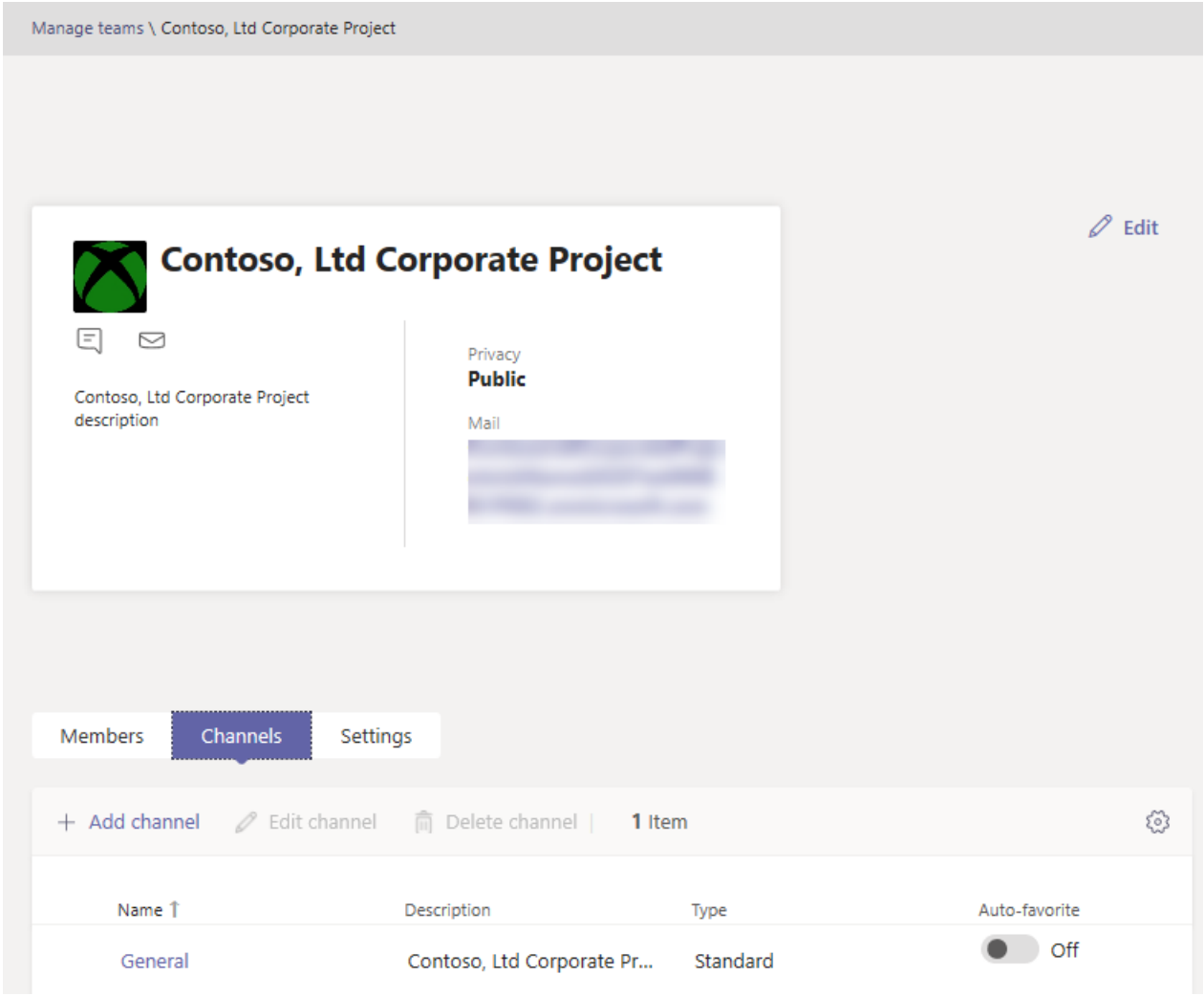
Search

Search currently supports the string "Begins with" and searches the **Team name** field.

Team profile

You can navigate to the team profile page of any team from the main teams overview grid by clicking the team name. The team profile page shows the members, owners, and guests that belong to the team (and its backing Microsoft 365 group), as well as the team's channels and settings. From the team profile page, you can:

- Add or remove members and owners.
- Add or remove channels (note that you can't remove the General channel).
- Change team and group settings.



Making changes to teams

On the team's profile page, you can change the following elements of a team:

- **Members** - add or remove members and promote or demote owners.
- **Channels** - add new channels, and edit or remove existing channels. Remember that you can't delete the default General channel.
- **Team name**
- **Description**
- **Privacy** - set whether the team is public or private.
- **Classification** - this is backed by your Microsoft 365 group classifications. Choose **Confidential**, **Highly Confidential**, or **General**.
- **Conversations settings** - set whether members can edit and delete sent messages.
- **Channels settings** - set whether members can create new channels and edit existing ones, and add, edit, and remove tabs, connectors, and apps.

The changes that you make to a team are logged. If you're modifying group settings (changing the name, description, photo, privacy, classification, or team members), the changes are attributed to you through the audit pipeline. If you're performing actions against Teams-specific settings, your changes are tracked and attributed to you in the General channel of the team.

Troubleshooting

Issue: Teams missing from the Team overview grid

Some of your teams are missing from the list of teams in the Teams overview grid.

Cause: This issue occurs when the team was incorrectly (or not yet) profiled by the system which can lead to a missing property for it to be recognized.

Resolution: Manually set the property to the correct value via MS Graph

Replace **{groupid}** in the Query for the actual GroupId in question, which you can get via the Exchange Online powershell, with the **"Get-UnifiedGroup"** cmdlet, as the "**ExternalDirectoryObjectId**" attribute.

1. Access Graph Explorer.
2. Sign in to Graph Explorer on the left menu.
3. Change the query line to: PATCH > v1.0 > https://graph.microsoft.com/v1.0/groups/{groupid}.
4. Add the following value on the request body: {"resourceProvisioningOptions": ["Team"]}.
5. Run the query on the top-right.
6. Confirm the team appears correctly in the Microsoft Teams admin center - Team Overview.

Learn more

- Teams cmdlet reference
- Use Teams administrator roles to manage Teams
- Plan for lifecycle management in Teams

Assign team owners and members in Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

IMPORTANT

The Microsoft Teams admin center is gradually replacing the Skype for Business admin center, and we're migrating Teams settings to it from the Microsoft 365 admin center. If a setting has been migrated, you'll see a notification and then be directed to the setting's location in the Teams admin center. For more information, see Manage Teams during the transition to the Teams admin center.

Within Microsoft Teams there are two user roles: **owner** and **member**. By default, a user who creates a new team is granted the owner status. In addition, owners and members can have moderator capabilities for a channel (provided that moderation has been set up). If a team is created from an existing Microsoft 365 Group, permissions are inherited.

The table below shows the difference in permissions between an owner and a member.

TASK	TEAM OWNER	TEAM MEMBER
Create team	Yes[1]	No
Leave team	Yes	Yes
Edit team name/description	Yes	No
Delete team	Yes	No
Add standard channel	Yes	Yes[2]
Edit standard channel name/description	Yes	Yes[2]
Delete standard channel	Yes	Yes[2]
***Add private channel**	Yes	Yes[2]
***Edit private channel name/description**	No	N/A
***Delete private channel**	Yes	No
Add members	Yes[3]	No[4]
Request to add members	N/A	Yes[5]
Add apps	Yes	Yes[2]

[1] Team owners can create teams unless they've been restricted from doing so. Permissions to create teams below.

[2] An owner can turn off these items at the team level, in which case members would not have access to them.
[3] After adding a member to a team, an owner can also promote a member to owner status. It is also possible for an owner to demote their own status to a member.
[4] Team members can add other members to a public team.
[5] While a team member can't directly add members to a private team, they can request someone to be added to a team they're already a member of. When a member requests someone to be added to a team, team owners receive an alert that they have a pending request that they can accept or deny.

*To learn more about permissions for private channels, see Private channels in Teams.

> **NOTE**
> Owners can make other members owners in the **View teams** option. A team can have up to 100 owners. We recommend that you have at least a few owners to help manage the team; this will also prevent orphaned groups if a sole owner leaves your organization. For more information about orphaned groups, see Assign a new owner to an orphaned group.

Moderator capabilities

In addition to other capabilities, team owners and members can have moderator capabilities for a channel (provided that moderation is turned on for a team). Moderators can start new posts in a channel and control whether team members can reply to existing channel messages. They can also control whether bots and connectors can submit channel messages.

Moderator capabilities are assigned at the channel level. Team owners have moderator capabilities by default. Team members have moderator capabilities turned off by default, but a team owner can give moderator capabilities for a channel to a team member. Moderators within a channel can add and remove other moderators within that channel.

For more information about moderator capabilities, see Set up and manage channel moderation in Microsoft Teams.

Assign a user role

To assign a user role, in Teams, select the team name and click **More options** > **Manage team**. On the **Members** tab, you can add members and choose owners and moderators (if you have sufficient permissions). For more information , see Change team settings in Teams.

Permissions to create teams

By default, all users with a mailbox in Exchange Online have permissions to create Microsoft 365 groups and therefore a team within Microsoft Teams. You can have tighter control and restrict the creation of new teams and thus the creation of new Microsoft 365 groups by delegating group creation and management rights to a set of users. For instructions, see Manage who can create Microsoft 365 Groups.

ICON	TITLE	DESCRIPTION
	Decision Point	Will all Microsoft Teams users be able to create Teams (recommended)?
	Next Steps	Modify the default permissions for who can create Microsoft 365 groups if you need to limit who can create Teams

Assign policies to your users in Microsoft Teams

12/5/2020 • 23 minutes to read • Edit Online

As an admin, you use policies to control the Teams features that are available to users in your organization. For example, there are calling policies, meeting policies, and messaging policies, to name just a few.

Organizations have different types of users with unique needs and custom policies that you create and assign let you tailor policy settings to different sets of users based on those needs.

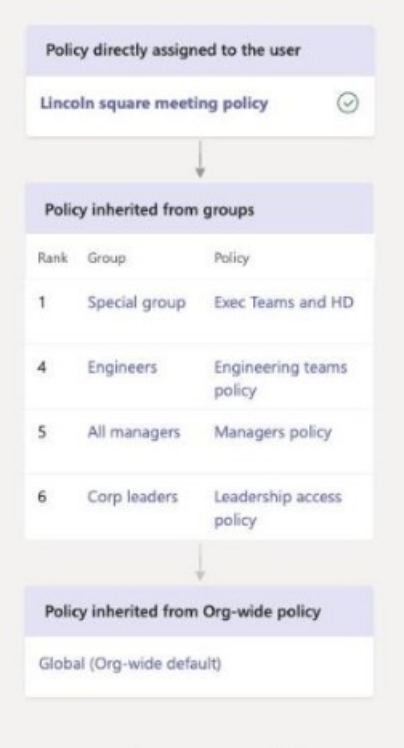
To make it easier to manage policies in your organization, Teams offers several ways to assign policies to users. You can assign a policy directly to users, either individually or at scale through a batch assignment, or to a group that the users are members of. You can also use policy packages to assign a preset collection of policies to users in your organization who have similar roles. The option that you choose depends on the number of policies that you're managing and the number of users that you're assigning to. By setting the global (Org-wide default) policies so that they apply to the largest number of users in your organization, you only have to assign policies to those users that require specialized policies.

This article describes the different ways that you can assign policies to users and the recommended scenarios for when to use what.

Which policy takes precedence?

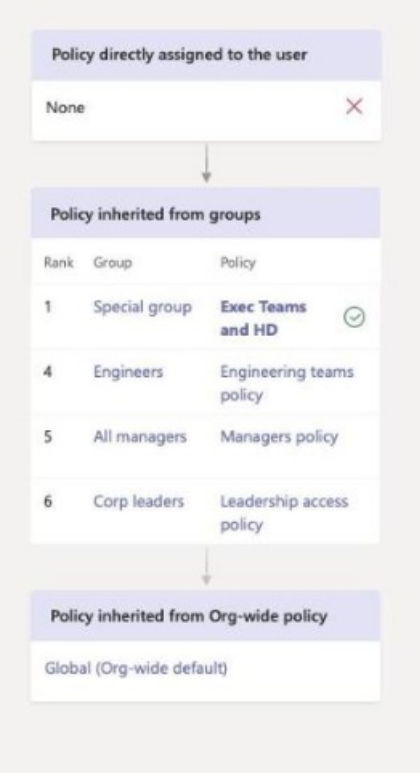
A user has one effective policy for each policy type. It's possible or even likely that a user is directly assigned a policy and is also a member of one or more groups that's assigned a policy of the same type. In these kinds of scenarios, which policy takes precedence? A user's effective policy is determined according to rules of precedence, as follows.

If a user is directly assigned a policy (either individually or through a batch assignment), that policy takes precedence. In the following example, the user's effective policy is the Lincoln Square meeting policy, which is directly assigned to the user.



If a user isn't directly assigned a policy of a given type, the policy assigned to a group that the user is a member of takes precedence. If a user is a member of multiple groups, the policy that has the highest group assignment ranking for the given policy type takes precedence.

In this example, the user's effective policy is the Exec Teams and HD policy, which has the highest assignment ranking relative to other groups that the user is a member of and that are also assigned a policy of the same policy type.



If a user isn't directly assigned a policy or isn't a member of any groups that are assigned a policy, the user gets the global (Org-wide default) policy for that policy type. Here's an example.



To learn more, see Precedence rules.

Ways to assign policies

Here's an overview of the ways that you can assign policies to users and the recommended scenarios for each. Click the links to learn more.

Before assigning policies to individual users or groups, start by setting the global (Org-wide default) policies so that they apply to the largest number of users in your organization. Once the global policies are set, you

will only need to assign policies to those users that require specialized policies.

DO THIS	IF...	USING...
Assign a policy to individual users	You're new to Teams and just getting started or you only need to assign one or a couple of policies to a small number of users.	The Microsoft Teams admin center or PowerShell cmdlets in the Skype for Business Online PowerShell module
Assign a policy to a group	You need to assign policies based on a user's group membership. For example, you want to assign a policy to all users in a security group or distribution list.	The Microsoft Teams admin center or PowerShell cmdlets in the Teams PowerShell module
Assign a policy to a batch of users	You need to assign policies to large sets of users. For example, you want to assign a policy to hundreds or thousands of users in your organization at a time.	The Microsoft Teams admin center or PowerShell cmdlets in the Teams PowerShell module
Assign a policy package to users	You need to assign multiple policies to specific sets of users in your organization who have the same or similar roles. For example, assign the Education (Teacher) policy package to teachers in your school to give them full access to chats, calling, and meetings and the Education (Secondary school student) policy package to secondary students to limit certain capabilities like private calling.	The Microsoft Teams admin center or PowerShell cmdlets in the Teams PowerShell module
Assign a policy package to a group (in private preview)	You need to assign multiple policies to a group of users in your organization who have the same or similar roles. For example, you want to assign a policy package to all users in a security group or distribution list.	The Microsoft Teams admin center (coming soon) or PowerShell cmdlets in the Teams PowerShell module
Assign a policy package to a batch of users	You need to assign multiple policies to a batch of users in your organization who have the same or similar roles. For example, assign the Education (Teacher) policy package to all teachers in your school using batch assignment to give them full access to chats, calling, and meetings and assign the Education (Secondary school student) policy package to a batch of secondary students to limit certain capabilities like private calling.	PowerShell cmdlets in the Teams PowerShell module

Set the global policies

Follow these steps to set the global (Org-wide default) policies for each policy type.

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, go to the policy page for the policy type you

want to update. For example, **Teams** > **Teams policies**, **Meetings** > **Meetings policies**, **Messaging policies**, or **Voice** > **Calling policies**.

2. Select the **Global (Org-wide default)** policy to view the current settings.
3. Update the policy as needed, and then select **Apply**.

Using PowerShell

To set the global policies using PowerShell, use the Global identifier. Start by reviewing the current Global policy to determine which setting you want to change.

```
Get-CsTeamsMessagingPolicy -Identity Global

Identity                      : Global
Description                   :
AllowUrlPreviews              : True
AllowOwnerDeleteMessage       : False
AllowUserEditMessage          : True
AllowUserDeleteMessage        : True
AllowUserChat                 : True
AllowRemoveUser               : True
AllowGiphy                    : True
GiphyRatingType               : Moderate
AllowMemes                    : True
AllowImmersiveReader          : True
AllowStickers                 : True
AllowUserTranslation          : False
ReadReceiptsEnabledType       : UserPreference
AllowPriorityMessages         : True
ChannelsInChatListEnabledType : DisabledUserOverride
AudioMessageEnabledType       : ChatsAndChannels
Expand (20 lines) Collapse
```

Next, update the Global policy as needed. You only need to specify values for the settings that you want to change.

```
Set-CsTeamsMessagingPolicy -Identity Global -AllowUserEditMessage $false
```

Assign a policy to individual users

Follow these steps to assign a policy to an individual user or to a small number of users at a time.

Using the Microsoft Teams admin center

To assign a policy to a user:

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then click the user.
2. Select the user by clicking to the left of the user name, and then click **Edit settings**.
3. Select the policy you want to assign, and then click **Apply**.

Or, you can also do the following:

1. In the left navigation of the Microsoft Teams admin center, go to the policy page.
2. Select the policy you want to assign by clicking to the left of the policy name.
3. Select **Manage users**.
4. In the **Manage users** pane, search for the user by display name or by user name, select the name, and then select **Add**. Repeat this step for each user that you want to add.
5. When you're finished adding users, select **Apply**.

Using PowerShell

Each policy type has its own set of cmdlets for managing it. Use the `Grant-` cmdlet for a given policy type to assign the policy. For example, use the `Grant-CsTeamsMeetingPolicy` cmdlet to assign a Teams meeting policy to users. These cmdlets are included in the Skype for Business Online PowerShell module and are documented in the Skype for Business cmdlet reference.

Download and install the Skype for Business Online PowerShell module (if you haven't already), and then run the following to connect to Skype for Business Online and start a session.

> **NOTE**
>
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module.
>
> If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
Import-Module -Name MicrosoftTeams
$Cred = Get-Credential
$CSSession = New-CsOnlineSession -Credential $Cred
Import-PSSession -Session $CSSession
```

In this example, we assign a Teams meeting policy named Student Meeting Policy to a user named Reda.

```
Grant-CsTeamsMeetingPolicy -Identity reda@contoso.com -PolicyName "Student Meeting Policy"
```

To learn more, read Manage policies via PowerShell.

Assign a policy to a group

Policy assignment to groups lets you assign a policy to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly.

Policy assignment to groups is recommended for groups of up to 50,000 users but it will also work with larger groups.

When you assign the policy, it's immediately assigned to the group. However, note that the propagation of the policy assignment to members of the group is performed as a background operation and may take some time, depending on the size of the group. The same is true when a policy is unassigned from a group, or when members are added to or removed from a group.

Group policy assignments are only propagated to users that are direct members of the group. The assignments aren't propagated to members of nested groups.

What you need to know about policy assignment to groups

Before you get started, it's important to understand precedence rules and group assignment ranking.

Precedence rules

For a given policy type, a user's effective policy is determined according to the following:

- A policy that's directly assigned to a user takes precedence over any other policy of the same type that's assigned to a group. In other words, if a user is directly assigned a policy of a given type, that user won't inherit a policy of the same type from a group. This also means that if a user has a policy of a given type that was directly assigned to them, you have to remove that policy from the user before they can inherit a policy of the same type from a group.

- If a user doesn't have a policy directly assigned to them and is a member of two or more groups and each group has a policy of the same type assigned to it, the user inherits the policy of the group assignment that has the highest ranking.
- If a user isn't a member of any groups that are assigned a policy, the global (Org-wide default) policy for that policy type applies to the user.

A user's effective policy is updated according to these rules when a user is added to or removed from a group that's assigned a policy, a policy is unassigned from a group, or a policy that's directly assigned to the user is removed.

Group assignment ranking

When you assign a policy to a group, you specify a ranking for the group assignment. This is used to determine which policy a user should inherit as their effective policy if the user is a member of two or more groups and each group is assigned a policy of the same type.

The group assignment ranking is relative to other group assignments of the same type. For example, if you're assigning a calling policy to two groups, set the ranking of one assignment to 1 and the other to 2, with 1 being the highest ranking. The group assignment ranking indicates which group membership is more important or more relevant than other group memberships with regards to inheritance.

Say, for example, you have two groups, Store Employees and Store Managers. Both groups are assigned a Teams calling policy, Store Employees Calling Policy and Store Managers Calling Policy, respectively. For a store manager who is in both groups, their role as a manager is more relevant than their role as an employee, so the calling policy that's assigned to the Store Managers group should have a higher ranking.

GROUP	TEAMS CALLING POLICY NAME	RANK
Store Managers	Store Managers Calling Policy	1
Store Employees	Store Employees Calling Policy	2

If you don't specify a ranking, the policy assignment is given the lowest ranking.

Using the Microsoft Teams admin center

> **NOTE**
> Currently, policy assignment to groups using the Microsoft Teams admin center is only available for Teams calling policy, Teams call park policy, Teams policy, Teams live events policy, Teams meeting policy, and Teams messaging policy. For other policy types, use PowerShell.

1. In the left navigation of the Microsoft Teams admin center, go to the policy type page. For example, go to **Meetings** > **Meeting policies**.
2. Select the **Group policy assignment** tab.
3. Select **Add group**, and then in the **Assign policy to group** pane, do the following:
   a. Search for and add the group you want to assign the policy to.
   b. Set the ranking for the group assignment.
   c. Select the policy that you want to assign.
   d. Select **Apply**.

To remove a group policy assignment, on the **Group policy assignment** tab of the policy page, select the group assignment, and then select **Remove**.

To change the ranking of a group assignment, you have to first remove the group policy assignment. Then, follow the steps above to assign the policy to a group.

Using PowerShell

> **NOTE**
> Currently, policy assignment to groups using PowerShell isn't available for all Teams policy types. See New-CsGroupPolicyAssignment for the list of supported policy types.

Install and connect to the Microsoft Teams PowerShell module

For step-by-step guidance, see Install Teams PowerShell.

Assign a policy to a group of users

You use the New-CsGroupPolicyAssignment cmdlet to assign a policy to a group. You can specify a group by using the object Id, SIP address, or email address.

In this example, we assign a Teams meeting policy named Retail Managers Meeting Policy to a group with an assignment ranking of 1.

```
New-CsGroupPolicyAssignment -GroupId d8ebfa45-0f28-4d2d-9bcc-b158a49e2d17 -PolicyType TeamsMeetingPolicy
-PolicyName "Retail Managers Meeting Policy" -Rank 1
```

Get policy assignments for a group

Use the Get-CsGroupPolicyAssignment cmdlet to get all policies assigned to a group. Note that groups are always listed by their group Id even if its SIP address or email address was used to assign the policy.

In this example, we retrieve all policies assigned to a specific group.

```
Get-CsGroupPolicyAssignment -GroupId e050ce51-54bc-45b7-b3e6-c00343d31274
```

In this example, we return all groups that are assigned a Teams meeting policy.

```
Get-CsGroupPolicyAssignment -PolicyType TeamsMeetingPolicy
```

Remove a policy from a group

Use the Remove-CsGroupPolicyAssignment cmdlet to remove a policy from a group. When you remove a policy from a group, the priorities of other policies of the same type assigned to that group and that have a lower ranking are updated. For example, if you remove a policy that has a ranking of 2, policies that have a ranking of 3 and 4 are updated to reflect their new ranking. The following two tables show this example.

Here's a list of the policy assignments and priorities for a Teams meeting policy.

GROUP NAME	POLICY NAME	RANK
Sales	Sales policy	1
West Region	West Region policy	2
Division	Division policy	3
Subsidiary	Subsidiary policy	4

If we remove the West Region policy from the West Region group, the policy assignments and priorities are updated as follows.

GROUP NAME	POLICY NAME	RANK
Sales	Sales policy	1
Division	Division policy	2
Subsidiary	Subsidiary policy	3

In this example, we remove the Teams meeting policy from a group.

```
Remove-CsGroupPolicyAssignment -PolicyType TeamsMeetingPolicy -GroupId f985e013-0826-40bb-8c94-
e5f367076044
```

Change a policy assignment for a group

> **NOTE**
> The Set-CsGroupPolicyAssignment cmdlet will be available soon. In the meantime, to change a group policy assignment, you can remove the current policy assignment from the group, and then add a new policy assignment.

After you assign a policy to a group, you can use the Set-CsGroupPolicyAssignment cmdlet to change that group's policy assignment as follows:

- Change the ranking
- Change the policy of a given policy type
- Change the policy of a given policy type and the ranking

In this example, we change a group's Teams call park policy to a policy named SupportCallPark and the assignment ranking to 3.

```
Set-CsGroupPolicyAssignment -GroupId 566b8d39-5c5c-4aaa-bc07-4f36278a1b38 -PolicyType TeamsMeetingPolicy
-PolicyName SupportCallPark -Rank 3
```

Change the effective policy for a user

Here's an example of how to change the effective policy for a user who is directly assigned a policy.

First, we use the Get-CsUserPolicyAssignment cmdlet together with the `PolicySource` parameter to get details of the Teams meeting broadcast policies associated with the user.

```
Get-CsUserPolicyAssignment -Identity daniel@contoso.com -PolicyType TeamsMeetingBroadcastPolicy | select
-ExpandProperty PolicySource
```

The output shows that the user was directly assigned a Teams meeting broadcast policy named Employee Events, which takes precedence over the policy named Vendor Live Events that's assigned to a group the user belongs to.

```
AssignmentType PolicyName         Reference
-------------- ----------         ---------
Direct         Employee Events
Group          Vendor Live Events 566b8d39-5c5c-4aaa-bc07-4f36278a1b38
```

Now, we remove the Employee Events policy from the user. This means that the user no longer has a Teams meeting broadcast policy directly assigned to them and will inherit the Vendor Live Events policy that's

assigned to the group the user belongs to.

Use the following cmdlet in the Skype for Business PowerShell module to do this.

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity daniel@contoso.com -PolicyName $null
```

You can use following cmdlet in the Teams PowerShell module to do this at scale though a batch policy assignment, where $users is a list of users that you specify.

```
New-CsBatchPolicyAssignmentOperation -OperationName "Assigning null at bulk" -PolicyType
TeamsMeetingBroadcastPolicy -PolicyName $null -Identity $users
```

Assign a policy to a batch of users

Using the Microsoft Teams admin center

To assign a policy to users in bulk:

1. In the left navigation of the Microsoft Teams admin center, select **Users**.
2. Search for the users you want to assign the policy to or filter the view to show the users you want.
3. In the ✓ (check mark) column, select the users. To select all users, click the ✓ (check mark) at the top of the table.
4. Click **Edit settings**, make the changes that you want, and then click **Apply**.

To view the status of your policy assignment, in the banner that appears at the top of the **Users** page after you click **Apply** to submit your policy assignment, click **Activity log**. Or, in the left navigation of the Microsoft Teams admin center, go to **Dashboard**, and then under **Activity log**, click **View details**. The Activity log shows policy assignments to batches of more than 20 users through the Microsoft Teams admin center from the last 30 days. To learn more, see View your policy assignments in the Activity log.

Using PowerShell

> **NOTE**
> Currently, batch policy assignment using PowerShell isn't available for all Teams policy types. See New-CsBatchPolicyAssignmentOperation for the list of supported policy types.

With batch policy assignment, you can assign a policy to large sets of users at a time without having to use a script. You use the New-CsBatchPolicyAssignmentOperation cmdlet to submit a batch of users and the policy that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch. You can then use the Get-CsBatchPolicyAssignmentOperation cmdlet to track the progress and status of the assignments in a batch.

You can specify users by their object Id or Session Initiation Protocol (SIP) address. Note that a user's SIP address often has the same value as the User Principal Name (UPN) or email address, but this is not required. If a user is specified using their UPN or email, but it has a different value than their SIP address, then policy assignment will fail for the user. If a batch includes duplicate users, the duplicates will be removed from the batch before processing and status will only be provided for the unique users remaining in the batch.

A batch can contain up to 5,000 users. For best results, do not submit more than a few batches at a time. Allow batches to complete processing before submitting more batches.

Install and connect to the Microsoft Teams PowerShell module

Run the following to install the Microsoft Teams PowerShell module. Make sure you install version 1.0.5 or later.

```
Install-Module -Name MicrosoftTeams
```

Run the following to connect to Teams and start a session.

```
Connect-MicrosoftTeams
```

When you're prompted, sign in using your admin credentials.

Install and connect to the Azure AD PowerShell for Graph module (optional)

You may also want to download and install the Azure AD PowerShell for Graph module (if you haven't already) and connect to Azure AD so that you can retrieve a list of users in your organization.

Run the following to connect to Azure AD.

```
Connect-AzureAD
```

When you're prompted, sign in using the same admin credentials that you used to connect to Teams.

Assign a policy to a batch of users

In this example, we use the New-CsBatchPolicyAssignmentOperation cmdlet to assign an app setup policy named HR App Setup Policy to a batch of users listed in the Users_ids.text file.

```
$user_ids = Get-Content .\users_ids.txt
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsAppSetupPolicy -PolicyName "HR App Setup Policy" -
Identity $users_ids -OperationName "Example 1 batch"
```

In this example, we connect to Azure AD to retrieve a collection of users and then assign a messaging policy named New Hire Messaging Policy to a batch of users specified by using their SIP address.

```
Connect-AzureAD
$users = Get-AzureADUser
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsMessagingPolicy -PolicyName "New Hire Messaging
Policy" -Identity $users.SipProxyAddress -OperationName "Example 2 batch"
```

Get the status of a batch assignment

Run the following to get the status of a batch assignment, where OperationId is the operation ID that's returned by the `New-CsBatchPolicyAssignmentOperation` cmdlet for a given batch.

```
$Get-CsBatchPolicyAssignmentOperation -OperationId f985e013-0826-40bb-8c94-e5f367076044 | fl
```

If the output shows that an error occurred, run the following to get more information about errors, which are in the `UserState` property.

```
Get-CsBatchPolicyAssignmentOperation -OperationId f985e013-0826-40bb-8c94-e5f367076044 | Select -
ExpandProperty UserState
```

To learn more, see Get-CsBatchPolicyAssignmentOperation.

Assign a policy package to users

A policy package in Teams is a collection of predefined policies and policy settings that you can assign to users who have the same or similar roles in your organization. Each policy package is designed around a user

role and includes predefined policies and policy settings that support activities typical for that role. Some examples of policy packages are the Education (Teacher) package and Healthcare (Clinical worker) package. To learn more, see Manage policy packages in Teams.

Assign a policy package to one user

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then click the user.
2. On the user's page, click **Policies**, and then next to **Policy package**, click **Edit**.
3. In the **Assign policy package** pane, select the package you want to assign, and then click **Save**.

Assign a policy package to multiple users

1. In the left navigation of the Microsoft Teams admin center, go to **Policy packages**, and then select the policy package you want to assign by clicking to the left of the package name.
2. Click **Manage users**.
3. In the **Manage users** pane, search for the user by display name or by user name, select the name, and then click **Add**. Repeat this step for each user that you want to add.
4. When you're finished adding users, click **Save**.

Assign a policy package to a group

This feature is in private preview

Policy package assignment to groups let you assign multiple policies to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly.

Policy package assignment to groups is recommended for groups of up to 50,000 users but it will also work with larger groups.

When you assign the policy package, it's immediately assigned to the group. However, note that the propagation of the policy assignment to members of the group is performed as a background operation and may take some time, depending on the size of the group. The same is true when a policy is unassigned from a group, or when members are added to or removed from a group.

> **IMPORTANT**
> Before you get started, it's important to understand precedence rules and group assignment ranking. Make sure you read and understand the concepts in What you need to know about policy assignment to groups earlier in this article.

Using the Microsoft Teams admin center (coming soon)

Policy package assignment to groups in the Microsoft Teams admin center is coming soon. Check back here for the latest updates.

Using PowerShell

Install and connect to the Microsoft Teams PowerShell module

For step-by-step guidance, see Install Teams PowerShell.

Assign a policy package to a group of users

You use the Grant-CsGroupPolicyPackageAssignment cmdlet to assign a policy package to a group. You can specify a group by using the object Id, SIP address, or email address. When you assign the policy package, specify a group assignment ranking for each policy type in the policy package.

In this example, we assign the Education_Teacher policy package to a group with an assignment ranking of 1 for TeamsAppSetupPolicy and TeamsMeetingBroadcastPolicy and a ranking of 2 for TeamsMeetingPolicy.

```
Grant-CsGroupPolicyPackageAssignment -GroupId "dae90bb4-120f-4a3e-a15d-30f142e79f69" -PackageName
"Education_Teacher" -PolicyRankings "TeamsAppSetupPolicy, 1", "TeamsMeetingBroadcastPolicy, 1",
"TeamsMeetingPolicy, 2"
```

Assign a policy package to a batch of users

With batch policy package assignment, you can assign a policy package to large sets of users at a time without having to use a script. You use the New-CsBatchPolicyAssignmentOperation cmdlet to submit a batch of users and the policy package that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch. You can then use the Get-CsBatchPolicyAssignmentOperation cmdlet to track the progress and status of the assignments in a batch.

You can specify users by their object Id or Session Initiation Protocol (SIP) address. Note that a user's SIP address often has the same value as the User Principal Name (UPN) or email address, but this is not required. If a user is specified using their UPN or email, but it has a different value than their SIP address, then policy assignment will fail for the user. If a batch includes duplicate users, the duplicates will be removed from the batch before processing and status will only be provided for the unique users remaining in the batch.

A batch can contain up to 5,000 users. For best results, do not submit more than a few batches at a time. Allow batches to complete processing before submitting more batches.

Install and connect to the Microsoft Teams PowerShell module

Run the following to install the Microsoft Teams PowerShell module (if you haven't already). Make sure you install version 1.0.5 or later.

```
Install-Module -Name MicrosoftTeams
```

Run the following to connect to Teams and start a session.

```
Connect-MicrosoftTeams
```

When you're prompted, sign in using your admin credentials.

Assign a policy package to a batch of users

In this example, we use the New-CsBatchPolicyAssignmentOperation cmdlet to assign the Education_PrimaryStudent policy package to a batch of users.

```
New-CsBatchPolicyPackageAssignmentOperation -Identity 1bc0b35f-095a-4a37-a24c-
c4b6049816ab,user1@econtoso.com,user2@contoso.com -PackageName Education_PrimaryStudent
```

Get the status of a batch assignment

Run the following to get the status of a batch assignment, where OperationId is the operation ID that's returned by the `New-CsBatchPolicyAssignmentOperation` cmdlet for a given batch.

```
$Get-CsBatchPolicyAssignmentOperation -OperationId f985e013-0826-40bb-8c94-e5f367076044 | fl
```

If the output shows that an error occurred, run the following to get more information about errors, which are in the `UserState` property.

```
Get-CsBatchPolicyAssignmentOperation -OperationId f985e013-0826-40bb-8c94-e5f367076044 | Select -
ExpandProperty UserState
```

To learn more, see Get-CsBatchPolicyAssignmentOperation.

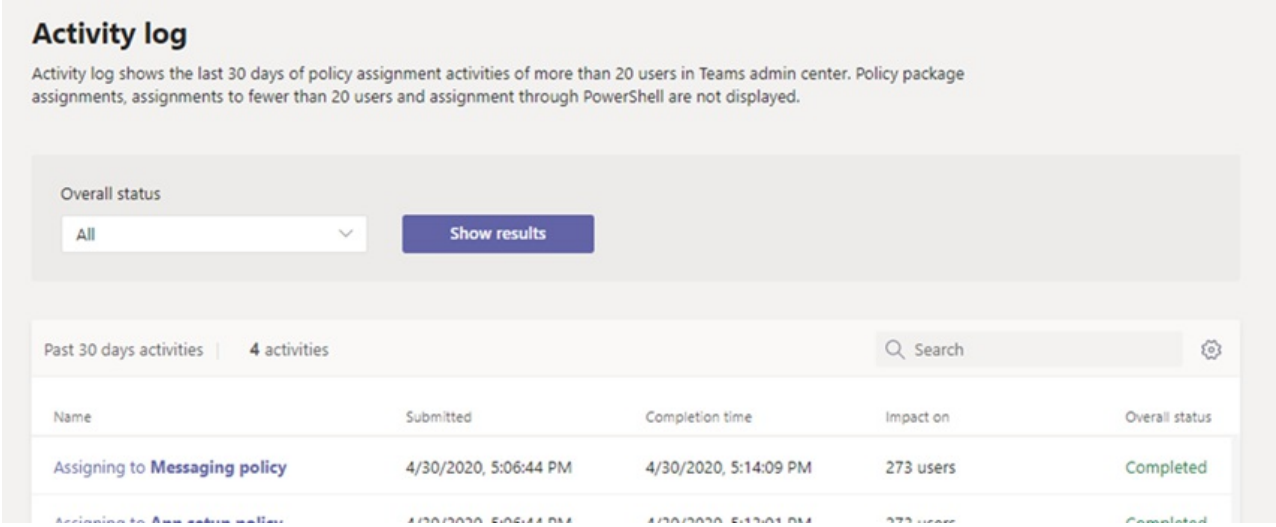
Related topics

Teams PowerShell Overview

View your policy assignments in the Activity log

5/26/2020 • 2 minutes to read • Edit Online

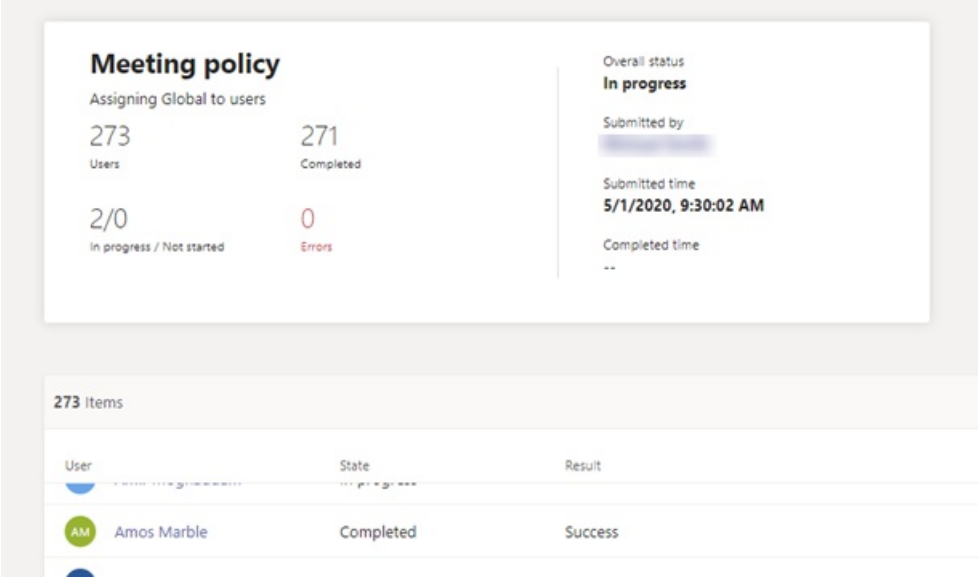
When you assign policies to users in the Microsoft Teams admin center, you can view the status of those policy assignments in the Activity log. The Activity log shows policy assignments to batches of more than 20 users through the Microsoft Teams admin center from the last 30 days. Keep in mind that the Activity log doesn't show policy package assignments, policy assignments to batches of less than 20 users through the Microsoft Teams admin center, or policy assignments through PowerShell.



View your policy assignment activities in the Activity log

To view your policy assignments in the Activity log:

1. In the left navigation of the Microsoft Teams admin center, go to **Dashboard**, and then under **Activity Log**, select **View details**.
2. You can view all policy assignments or filter the list by status to show only assignments that are **Not started**, **In progress**, or **Completed**. You'll see the following information about each assignment:
   - **Name**: The name of the policy assignment. Click the link to view more details. This includes the number of users the policy was assigned to and the number of assignments completed, in progress, and not started. You'll also see the list of users in the batch, and the status and result for each user. Here's an example:



- **Submitted**: Date and time the policy assignment was submitted.
- **Completion time**: Date and time the policy assignment was completed.
- **Impact on**: Number of users in the batch.
- **Overall status**: Status of the policy assignment.

> **NOTE**
>
> You can also get to the Activity log from the **Users** page. After you click **Apply** to submit a bulk policy assignment, you'll see a banner at the top of the page. Click the **Activity log** link in the banner.

Related topics

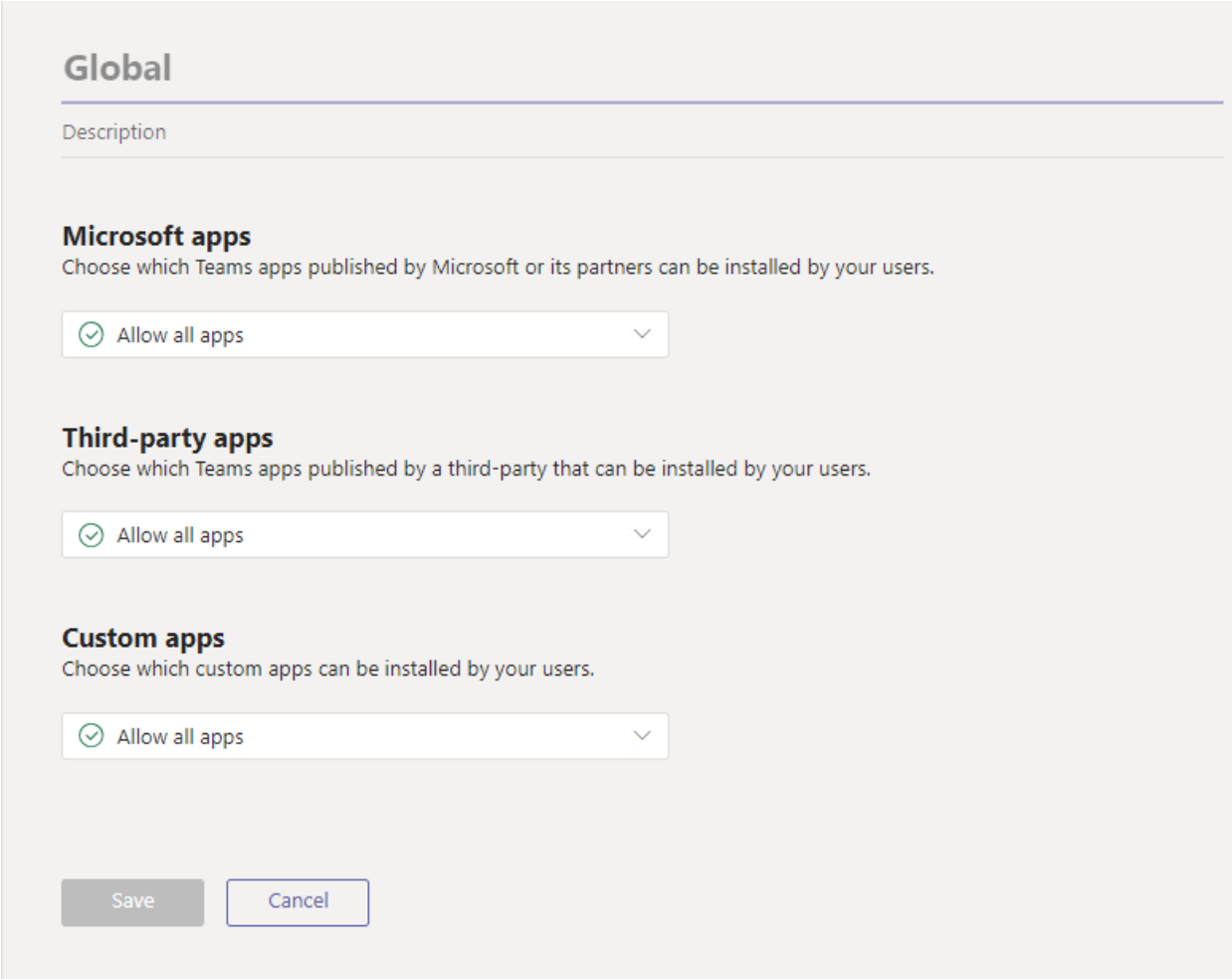
- Assign policies to users

Manage app permission policies in Microsoft Teams

7/6/2020 • 7 minutes to read • Edit Online

As an admin, you can use app permission policies to control what apps are available to Microsoft Teams users in your organization. You can allow or block all apps or specific apps published by Microsoft, third-parties, and your organization. When you block an app, users who have the policy are unable to install it from the Teams app store. You must be a global admin or Teams service admin to manage these policies.

You manage app permission policies in the Microsoft Teams admin center. You can use the global (Org-wide default) policy or create and assign custom policies. Users in your organization will automatically get the global policy unless you create and assign a custom policy. After you edit or assign a policy, it can take a few hours for changes to take effect.



NOTE

Org-wide app settings override the global policy and any custom policies that you create and assign to users.

If your organization is already on Teams, the app settings you configured in **Tenant-wide settings** in the Microsoft 365 admin center are reflected in org-wide app settings on the Manage apps page. If you're new to Teams and just getting started, by default, all apps are allowed in the global policy. This includes apps published by Microsoft, third-parties, and your organization.

Say, for example, you want to block all third-party apps and allow specific apps from Microsoft for the HR team in your organization. First, you would go to the Manage apps page and make sure that the apps that you want

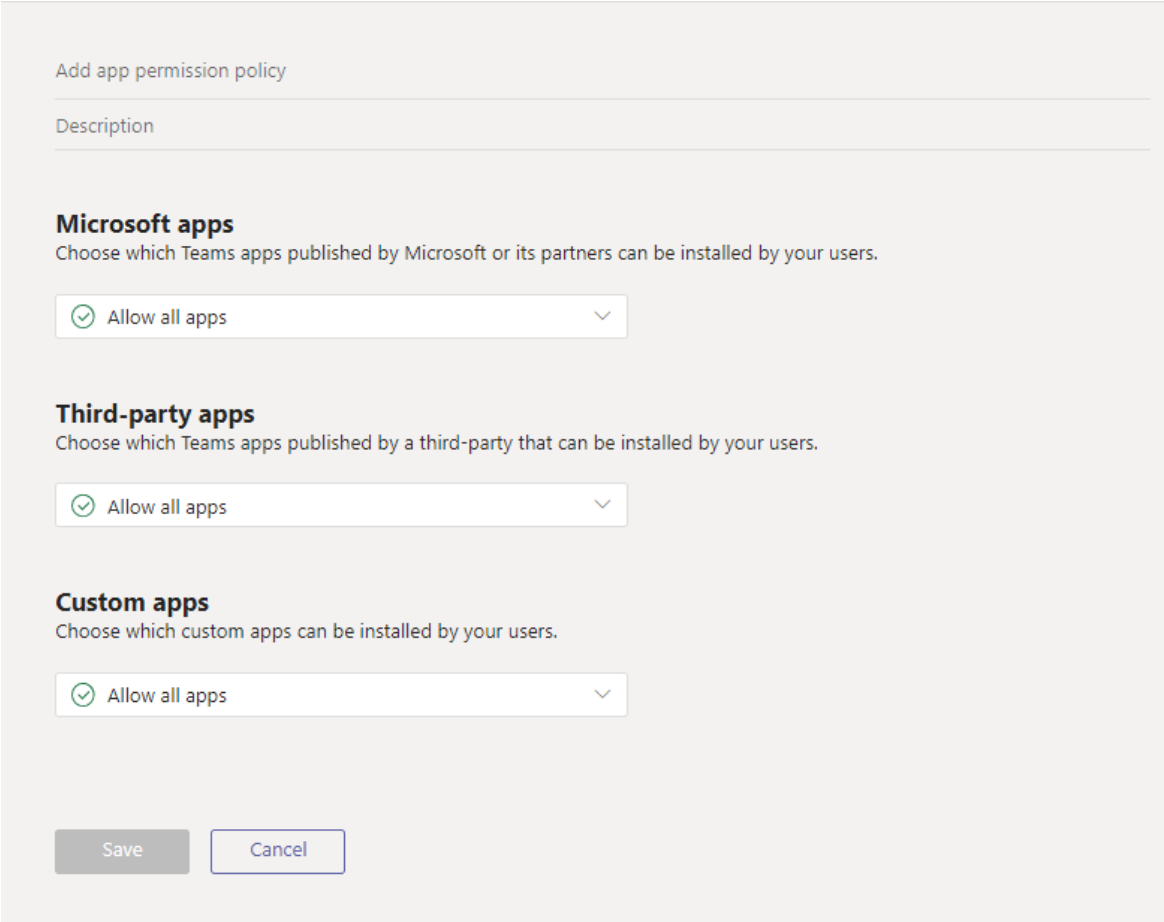
to allow for the HR team are allowed at the org level. Then, create a custom policy named HR App Permission Policy, set it to block and allow the apps that you want, and assign it to users on the HR team.

> **NOTE**
>
> If you deployed Teams in a Microsoft 365 Government Community Cloud (GCC) environment, see Manage org-wide app settings for Microsoft 365 Government to learn more about third-party app settings that are unique to GCC.

Create a custom app permission policy

If you want to control the apps that are available for different groups of users in your organization, create and assign one or more custom app permission policies. You can create and assign separate custom policies based on whether apps are published by Microsoft, third-parties, or your organization. It's important to know that after you create a custom policy, you can't change it if third-party apps are disabled in org-wide app settings.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Permission policies**.
2. Click **Add**.



3. Enter a name and description for the policy.
4. Under **Microsoft apps**, **Third-party apps**, and **Custom apps**, select one of the following:
   - **Allow all apps**
   - **Allow specific apps and block all others**
   - **Block specific apps and allow all others**
   - **Block all apps**
5. If you selected **Allow specific apps and block others**, add the apps that you want to allow:
   a. Select **Allow apps**.
   b. Search for the apps that you want to allow, and then click **Add**. The search results are filtered to the

app publisher (**Microsoft apps**, **Third-party apps**, or **Custom apps**).

c. When you've chosen the list of apps, click **Allow**.

6. Similarly, if you selected **Block specific apps and allow all others**, search for and add the apps that you want to block, and then click **Block**.

7. Click **Save**.

Edit an app permission policy

You can use the Microsoft Teams admin center to edit a policy, including the global policy and custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Permission policies**.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. From here, make the changes that you want. You can manage settings based on the app publisher and add and remove apps based on the allow/block setting.
4. Click **Save**.

Assign a custom app permission policy to users

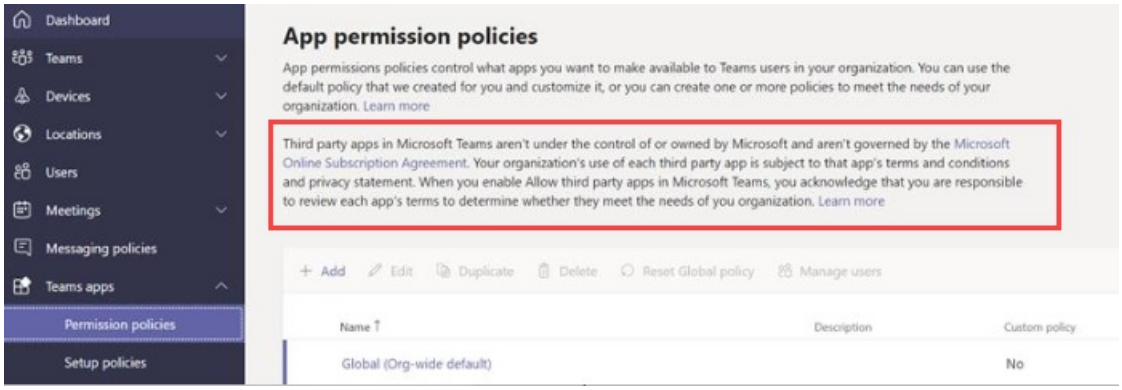
You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Manage org-wide app settings for Microsoft 365 Government

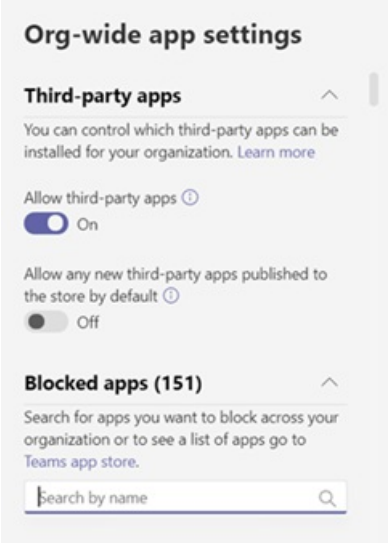
In a Microsoft 365 Government - GCC deployment of Teams, it's important to know the following about third-party app settings, which are unique to GCC.

In GCC, all third-party apps are blocked by default. Additionally, you'll see the following note about managing third-party apps on the app permission policies page in the Microsoft Teams admin center.



Use org-wide app settings to control whether users can install third-party apps. Org-wide app settings govern the behavior for all users and override any other app permission policies assigned to users. You can use them to control malicious or problematic apps.

1. On the **Permission policies** page, select **Org-wide app settings**. You can then configure the settings you want in the panel.



2. Under **Third-party apps**, turn off or turn on these settings to control access to third-party apps:

   - **Allow third-party apps**: This controls whether users can use third-party apps. If you turn off this setting, your users won't be able to install or use any third-party apps. In a Microsoft 365 Government - GCC deployment of Teams, thissetting is off by default.
   - **Allow any new third-party apps published to the store by default**: This controls whether new third-party apps that are published to the Teams app store become automatically available in Teams. You can only set this option if you allow third-party apps.
3. Under **Blocked apps**, add the apps you want to block across your organization. In a Microsoft 365 Government - GCC deployment of Teams, all third-party apps are added to this list by default. For any third-party app you want to allow in your organization, remove the app from this blocked apps list. When you block an app org-wide, the app is automatically blocked for all your users, regardless of whether it's allowed in any app permission policies
4. Click **Save** for org-wide app settings to take effect.

As mentioned earlier, to allow third-party apps, you can either edit and use the global (Org-wide default) policy or create and assign custom policies.

FAQ

Working with app permission policies

What app interactions do permission policies affect?

Permission policies govern app usage by controlling installation, discovery, and interaction for end users. Admins can still manage apps in the Microsoft Teams admin center regardless of the permission policies assigned to them.

Can I control line of business (LOB) apps?

Yes, you can use app permission policies to control the rollout and distribution of custom (LOB) apps. You can create a custom policy or edit the global policy to allow or block custom apps based on the needs of your organization.

How do app permission policies relate to pinned apps and app setup policies?

You can use app setup policies together with app permission policies. Pre-pinned apps are selected from the set of enabled apps for a user. Additionally, if a user has an app permission policy that blocks an app in their app setup policy, that app won't appear in Teams.

Can I use app permission policies to restrict uploading custom apps?

You can use org-wide settings on the **Manage apps** page, or app setup policies to restrict uploading custom apps for your organization.

To restrict specific users from uploading custom apps, use custom app policies. To learn more, see Manage custom app policies and settings in Teams.

Does blocking an app apply to Teams mobile clients?

Yes, when you block an app, that app is blocked across all Teams clients.

User experience

What does a user experience when an app is blocked?

Users can't interact with a blocked app or its capabilities, such bots, tabs, and messaging extensions. In a shared context, such as a team or group chat, bots can still send messages to all participants of that context. Teams indicates to the user when an app is blocked.

For example, when an app is blocked, users can't do any of the following:

- Add the app personally or to a chat or team
- Send messages to the app's bot
- Perform button actions that send information back to the app, such as actionable messages
- View the app's tab
- Set up connectors to receive notifications
- Use the app's messaging extension

The legacy portal allowed controlling apps at the organization level, which means when an app is blocked, it's blocked for all users in the organization. Blocking an app on the Manage apps page works exactly the same way.

For app permission policies assigned to specific users, if an app with bot or connector capability was allowed and then blocked, and if the app is then allowed only for some users in a shared context, members of a group chat or channel that don't have permission to that app can see the message history and messages that were posted by the bot or connector, but can't interact with it.

Related topics

Admin settings for apps in Teams

Assign policies to your users in Teams

Manage app setup policies in Microsoft Teams

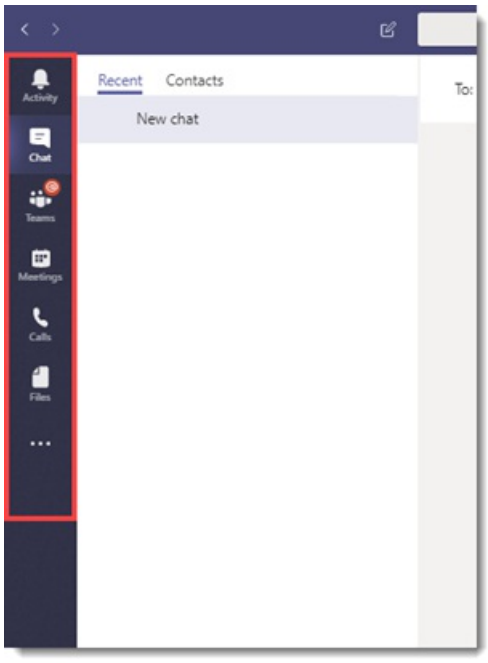
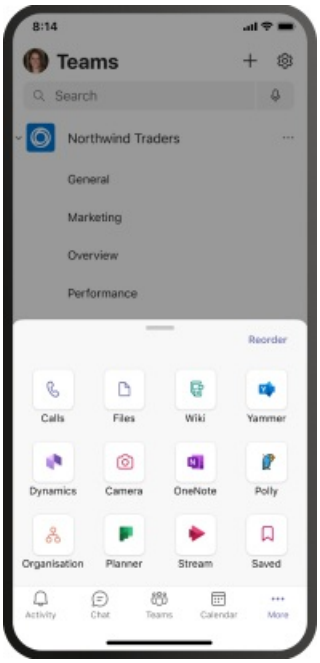
10/2/2020 • 7 minutes to read • Edit Online

> **NOTE**
> If you enabled the org-wide app setting, **Allow interaction with custom apps**, you may not see app setup policies yet in the Microsoft Teams admin center. It's currently being rolled out and will be available soon in your organization.

As an admin, you can use app setup policies to do the following tasks:

- Customize Teams to highlight the apps that are most important for your users. You choose the apps to pin and set the order that they appear. Pinning apps lets you showcase apps that users in your organization need, including apps built by third parties or by developers in your organization.
- Control whether users can pin apps to Teams.
- Install apps on behalf of users **(in preview)**. You choose which apps are installed by default for users when they start Teams. Keep in mind that users can still install apps themselves if the app permission policy that's assigned to them allows it.

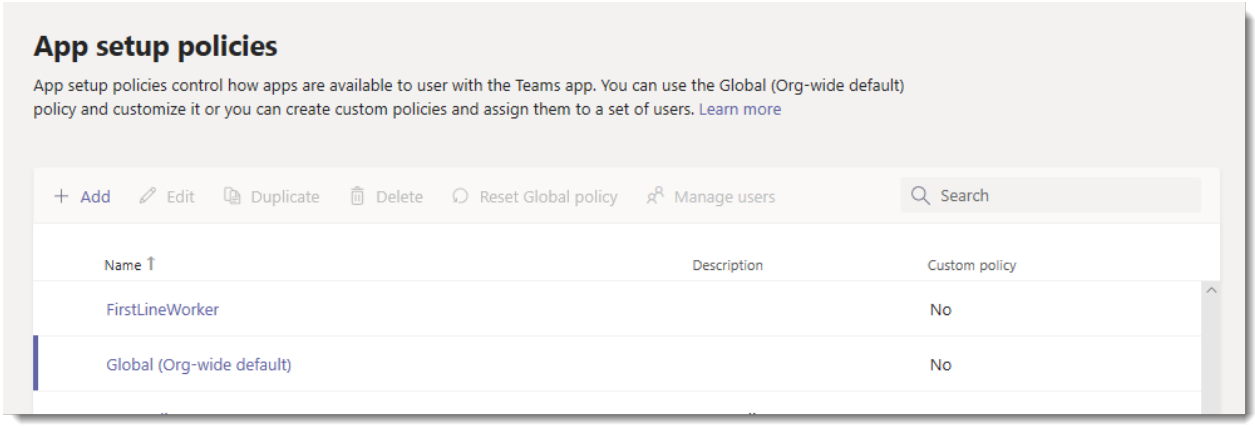
Apps are pinned to the app bar, which is the bar on the side of the Teams desktop client and at the bottom of the Teams mobile clients (iOS and Android).

TEAMS DESKTOP CLIENT	TEAMS MOBILE CLIENT
	

To see their pre-installed apps, in the app bar, users select **... More apps** in the Teams desktop and web clients and swipe up in the mobile clients.

You manage app setup policies in the Microsoft Teams admin center. Use the global (Org-wide default) policy or create and assign custom policies. Users in your organization will automatically get the global policy unless you create and assign a custom policy. You must be a global admin or Teams service admin to manage these policies.

You edit the settings in the global policy to include the apps that you want. To customize Teams for different groups of users in your organization, create and assign one or more custom policies.

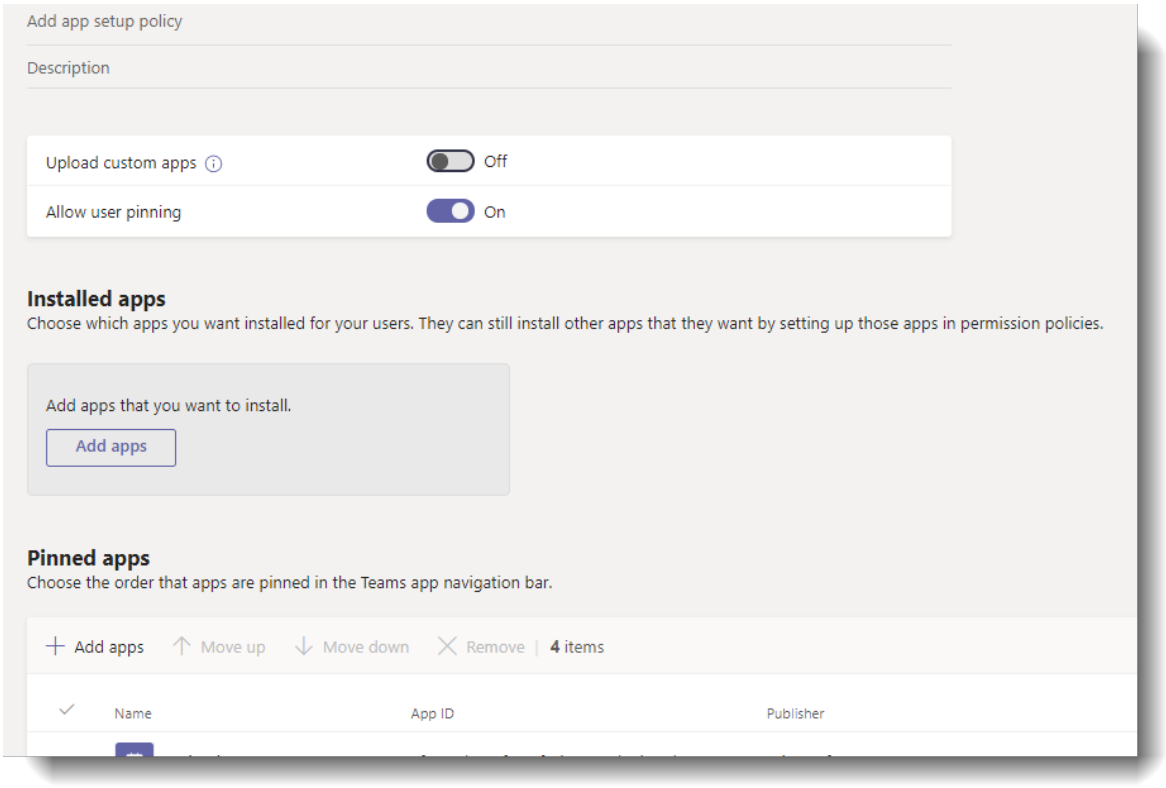


> **NOTE**
>
> If you have Teams for Education, it's important to know that the Assignments app is pinned by default in the global policy even though currently, you don't see it listed in the global policy. It will be the fourth app in the list of pinned apps on Teams clients.

Create a custom app setup policy

You can use the Microsoft Teams admin center to create a custom policy.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**.
2. Select **Add**.

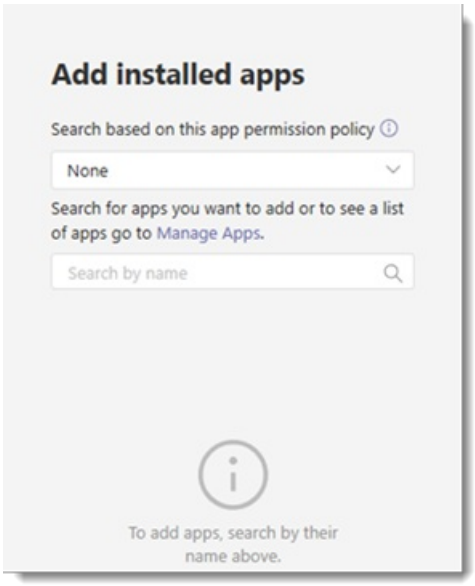


3. Enter a name and description for the policy.
4. Turn on or turn off **Upload custom apps**, depending on whether you want to let users upload custom apps to Teams. You can't change this setting if **Allow third-party apps** is turned off in org-wide app settings.
5. Turn on or turn off **Allow user pinning**, depending on whether you want to let users personalize their app bar by pinning apps to it.

6. To install apps for users **(in preview)**, do the following tasks:

    a. Under **Installed apps**, select **Add apps**.

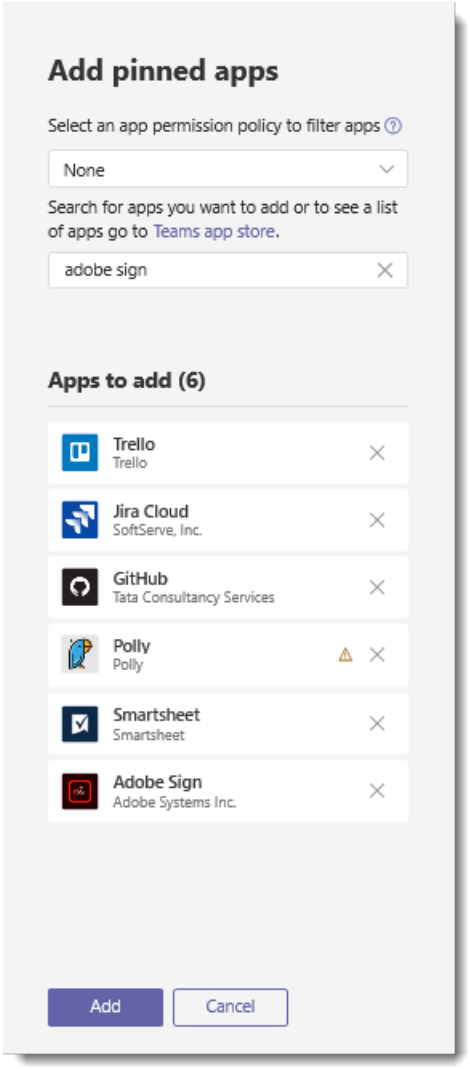
    b. In the **Add installed apps** pane, search for the apps you want to automatically install for users when they start Teams. You can also filter apps by app permission policy. When you've chosen your list of apps, select **Add**.



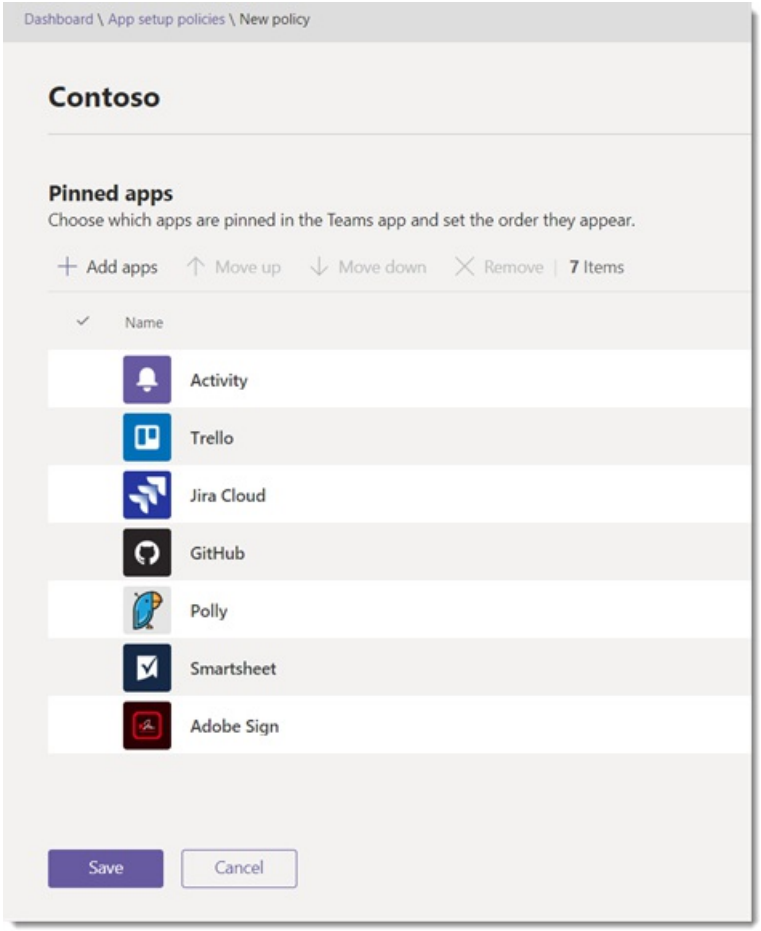
7. To pin apps, do the following:

    a. Under **Pinned apps**, select **Add apps**.

    b. In the **Add pinned apps** pane, search for the apps you want to add, and then select **Add**. You can also filter apps by app permission policy. When you've chosen your list of apps to pin, select **Add**.



c. Arrange the apps in the order that you want them to appear in Teams, and then select **Save**.



Edit an app setup policy

You can use the Microsoft Teams admin center to edit a policy, including the global (Org-wide default) policy and custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**.
2. Select the policy by clicking to the left of the policy name, and then select **Edit**.
3. From here, make the changes that you want.
4. Select **Save**.

Assign a custom app setup policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

FAQ

Working with app setup policies

What built-in app setup policies are included in the Microsoft Teams admin center

- **Global (Org-wide default)**: This default policy applies to all users in your organization unless you assign another policy. Edit the global policy to pin apps that are most important for your users.
- **FirstLineWorker**: This policy is for Firstline Workers. You can assign it to Firstline Workers in your organization. It's important to know that like custom policies that you create, you have to assign the policy to users for the settings to be active. For more information, go to the Assign a custom app setup policy to users section of this article.

Why can't I find an app in the Add pinned apps pane

Not all apps can be pinned to Teams through an app setup policy. Some apps may not support this functionality. To find apps that can be pinned, search for the app in the **Add pinned apps** pane. Tabs that have a personal scope (static tabs) and bots can be pinned to the Teams desktop client and these apps are available in the **Add pinned apps** pane.

Keep in mind that the Teams app store lists all Teams apps. The **Add pinned apps** pane includes only apps that can be pinned to Teams through a policy.

I'm a Teams for Education admin. What do I need to know about app setup policies in Teams for Education

The Calling app isn't available in Teams for Education. When you create a new custom app setup policy, the Calling app is displayed in the list of apps. However, the app isn't pinned to Teams clients and Teams for Education users won't see the Calls app in Teams.

How many pinned apps can be added to a policy

A minimum of two apps must be pinned to the Teams mobile clients (iOS and Android). If a policy has fewer than two apps, the mobile clients won't reflect the policy settings and instead will continue to use the existing configuration.

There's no limit on the number of pinned apps you can add to a policy.

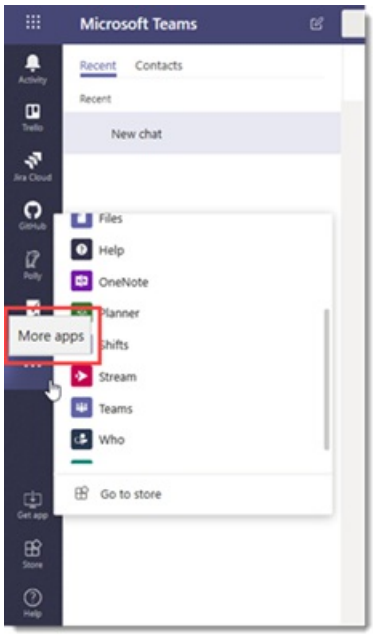
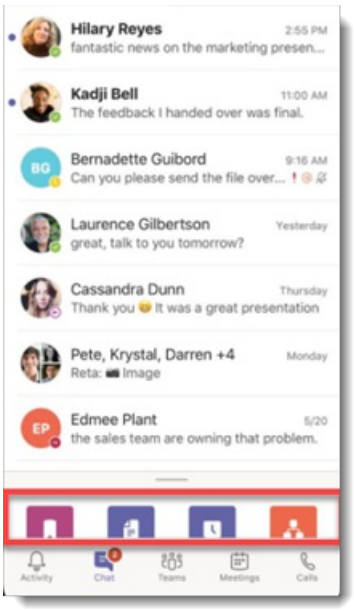
How long does it take for policy changes to take effect

After you edit or assign a policy, it can take a few hours for changes to take effect.

User experience

How can users see all their pinned apps in Teams

To view all apps that are pinned for a user, users might have to do the following depending on the number of installed apps and the size of their Teams client window.

TEAMS DESKTOP CLIENT	TEAMS MOBILE CLIENT
In the app bar on the side of Teams, select **... More apps**.	In the app bar near the bottom of Teams, swipe up.
	

What do I need to know about the Teams mobile experience

The Teams mobile clients (iOS and Android) currently don't support personal apps with static tabs. Depending on the apps set in the policy, apps pinned to the Teams desktop client might not appear in the Teams mobile clients. Personal bots will still appear in Chat on mobile clients.

With the Teams mobile clients, users will see core Teams apps such as Activity, Chat, and Teams, and you can pin some first-party apps from Microsoft, such as Shifts.

Can users change the order of apps pinned through a policy

Users can change the order of their pinned apps on Teams desktop and mobile clients if the **Allow user pinning** option is turned on. Users can't change the order of their pinned apps on Teams web clients.

Does user pinning take precedence

If the app setup policy assigned to the user is changed to block user app pinning, Teams removes any apps pinned to the app bar. If the policy is then changed to allow user app pinning, users must re-pin their previously pinned apps.

Custom Teams apps

My organization built a custom Teams app and published it, either to AppSource or the tenant app catalog, but the app icon isn't displayed as expected when the app is pinned to the app bar in Teams. How do I fix it

Make sure that you follow the logo guidelines before you submit the app. To learn more, see Checklist for Seller Dashboard submission.

Related topics

Admin settings for apps in Teams

Assign policies to your users in Teams

Manage custom app policies and settings in Microsoft Teams

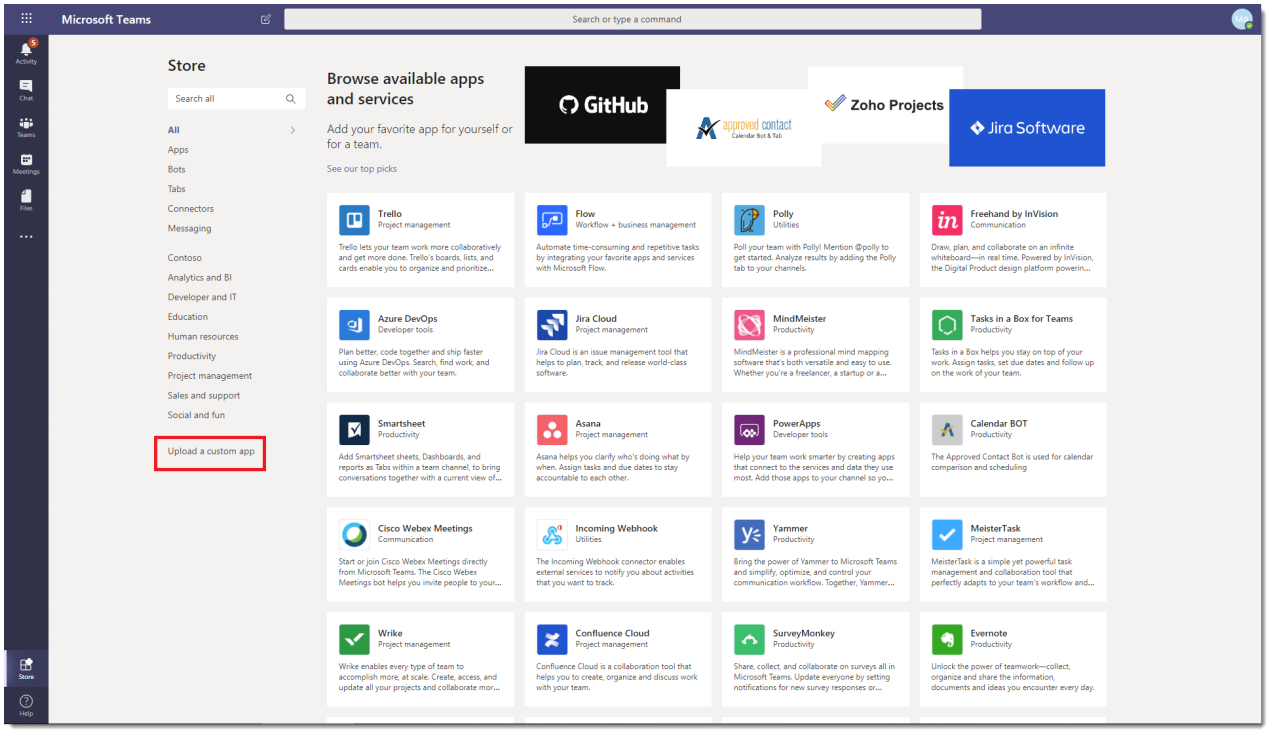
6/30/2020 • 5 minutes to read • Edit Online

> **NOTE**
>
> To use App Studio see Get started on the Microsoft Teams platform with C#/.NET and App Studio The last step is not working yet, so you will need to download the zip and install it the old way at Upload an app package to Microsoft Teams.

As an admin, you can use custom app policies and settings to control who in your organization can upload custom apps to Microsoft Teams. Admins decide which users can upload custom apps, and admins and team owners can determine whether specific teams in your organization allow custom apps to be added to them. After you edit the custom app policy, it can take a few hours for changes to take effect. You must be a global admin or Teams service admin to manage these policies.

Overview of custom apps

Users can add a custom app to Teams by uploading an app package (in a .zip file) directly to a team or in the personal context. This is different from how apps are added through the Teams app store. Adding a custom app by uploading an app package, also known as sideloading, lets you test an app as it's being developed, before it's ready to be widely distributed. It also lets you build an app for internal use only and share it with your team without submitting it to the Teams app catalog in the Teams app store.



Custom app policy and settings

Three components determine whether a user can upload a custom app to a team, giving you granular control over who can add custom apps to a team and which teams custom apps can be added to:

- User custom app policy

- Team custom app setting
- Org-wide custom app setting

These settings don't affect the ability to block third-party apps.

User custom app policy

As part of app setup policies, admins can use a policy setting, **Upload custom apps**, to control whether a user can upload custom apps to Teams.

If this setting is turned off:

- The user can't upload a custom app to any team in your organization or in the personal context.
- The user can interact with custom apps, depending on the org-wide custom app setting.

If this setting is turned on:

- The user can upload custom apps to teams that allow it and to teams for which they are owners, depending on the org-wide custom app setting.
- The user can upload custom apps to the personal context.
- The user can interact with custom apps, depending on the org-wide custom app setting.

You can edit the settings in the global app setup policy to include the apps that you want. If you want to customize Teams for different groups of users in your organization, create and assign one or more custom app setup policies.

Set a user custom app policy

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**.
2. Click **Add**.
3. Turn on or turn off **Upload custom apps**.
4. Choose any other settings that you want to for the policy.
5. Click **Save**.

Team custom app setting

Admins and team owners can control whether a team allows for custom apps to be added to it. This setting, **Allow members to upload custom apps**, together with a user's custom app policy determines who can add custom apps to a particular team.

If this setting is turned off:

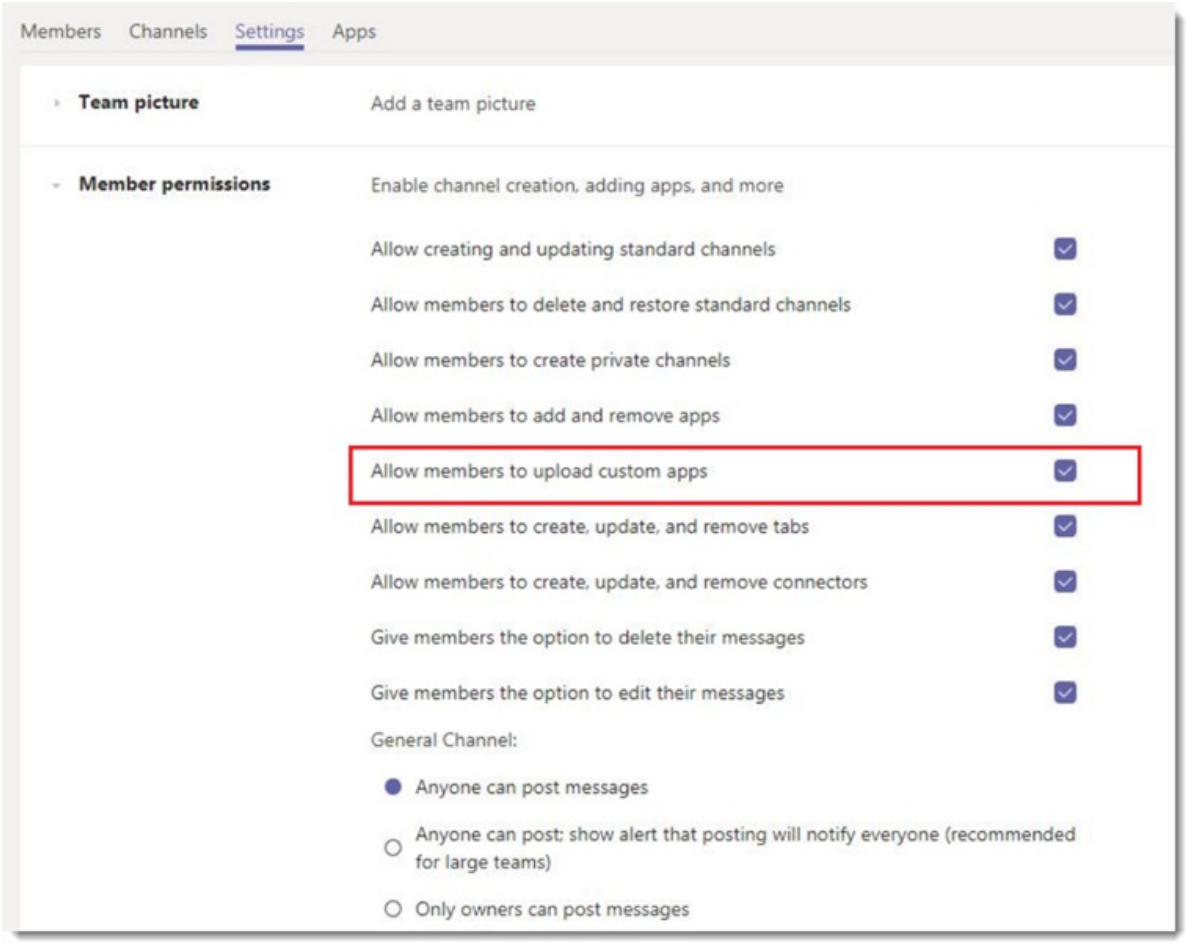
- Team owners can add custom apps, if their custom app policy allows it.
- Team members who aren't team owners can't add custom apps to the team.

If this setting is turned on:

- Team owners can add custom apps, if their custom app policy allows for it.
- Team members who aren't team owners can add custom apps, if their custom app policy allows for it.

Configure the team custom app setting

1. In Teams, go to the team, click **More options úúú** > **Manage team**.
2. Click **Settings**, and then expand **Member permissions**.
3. Select or clear the **Allow members to upload custom apps** check box.

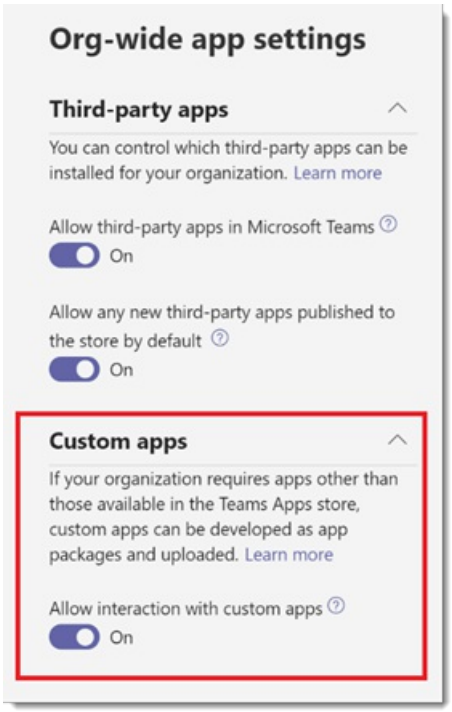


Org-wide custom app setting

The **Allow interaction with custom apps** org-wide custom app setting on the Manage apps page applies to everyone in your organization and governs whether they can upload or interact with custom apps. This setting overrides the user and team custom app policy and setting. It's intended to serve as a master on/off switch during security events.

Configure the org-wide custom app setting

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. Click **Org-wide app settings**.
3. Under **Custom apps**, turn on or turn off **Allow interaction with custom apps**.



How custom app policies and settings work together

This table summarizes the custom app policy and settings, how they work together, and their combined effect on controlling who in your organization can upload custom apps to Teams.

Say, for example, you want to allow only team owners to upload custom apps to specific teams. You would set the following:

- Turn on the **Allow interaction with custom apps** setting in the Microsoft Teams admin center.
- Turn off the **Allow members to upload custom apps** for every team to which you want to restrict access.
- Create and assign a custom app setup policy in the Microsoft Teams admin center with the **Upload custom apps** setting turned on, and assign it to the team owners.

ORG-WIDE CUSTOM APP SETTING	TEAM CUSTOM APP SETTING	USER CUSTOM APP POLICY	EFFECT
Off	Off	Off	Interaction with all custom apps is blocked for your organization. Custom apps can't be uploaded by anyone except a Teams Service Admin or a Global admin. You can use PowerShell to remove the custom app.
Off	Off	On	Interaction with all custom apps is blocked for your organization. Custom apps can't be uploaded by anyone except a Teams Service Admin or a Global admin. You can use PowerShell to remove the custom app.

ORG-WIDE CUSTOM APP SETTING	TEAM CUSTOM APP SETTING	USER CUSTOM APP POLICY	EFFECT
Off	On	Off	Interaction with all custom apps is blocked for your organization. Custom apps can't be uploaded by anyone except a Teams Service Admin or a Global admin. You can use Windows PowerShell to delete custom apps.
Off	On	On	Interaction with all custom apps is blocked for your organization. Custom apps can't be uploaded by anyone except a Teams Service Admin or a Global admin. You can use PowerShell to remove the custom app.
On	Off	Off	The user can't upload custom apps.
On	Off	On	If the user is a team owner, they can upload custom apps to the team. If the user isn't a team owner, they can't upload custom apps to the team. The user can upload custom apps in the personal context.
On	On	Off	The user can't upload custom apps.
On	On	On	The user can upload custom apps to the team, regardless of whether the user is a team owner. The user can upload custom apps in the personal context.

Related topics

Admin settings for apps in Teams

Assign policies to your users in Teams

Manage feedback policies in Microsoft Teams

10/13/2020 • 3 minutes to read • Edit Online

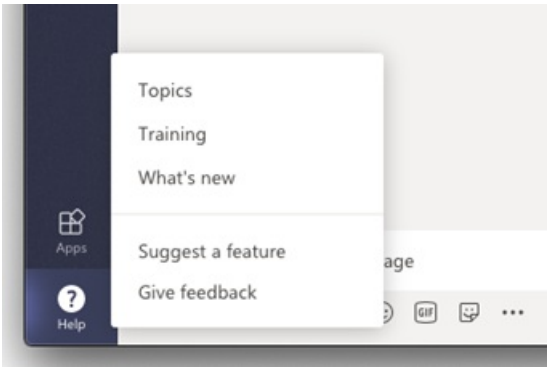
This is a preview or early release feature.

Users in your organization can send feedback about Teams to Microsoft let us know how we're doing, directly from within the Teams desktop and web clients. We're continually improving the Teams experience and we use this feedback to make Teams better.

> **NOTE**
> Feedback policies aren't available in GCC, GCC High, or DOD deployments.

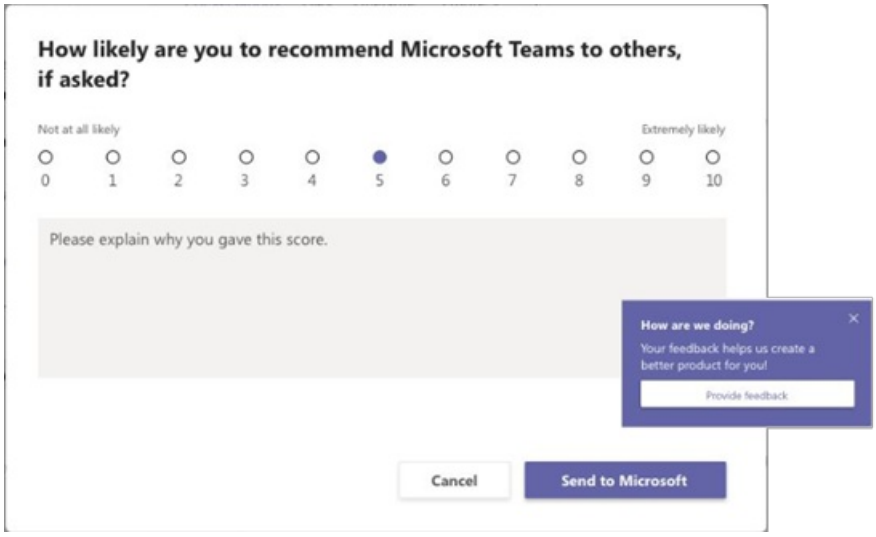
The Give feedback feature

Users can send comments and suggestions about Teams to us by going to **Help** > **Give feedback** in Teams. Data sent through **Give feedback** is considered as "Support Data" under your Microsoft 365 or Office 365 agreement, including information that would otherwise be considered "Customer Data" or "Personal Data".



Surveys

Users can also rate their experience with Teams and send us details about the rating they give. This pop-up survey is displayed to users from time-to-time in Teams. When a user clicks **Provide feedback** in the notification, the survey is displayed for them to complete.



Set whether users can send feedback about Teams to Microsoft

As an admin, you can control whether users in your organization can send feedback about Teams to Microsoft through **Give feedback** and whether they receive the survey. By default, all users in your organization are automatically assigned the global (Org-wide default) policy and the **Give feedback** feature and survey are enabled in the policy. The exception is Teams for Education, where the features are enabled for teachers and disabled for students.

You can edit the global policy or create and assign a custom policy. After you edit the global policy or assign a custom policy, it can take a few hours for changes to take effect.

Say, for example, you want to allow all users in your organization to send feedback through **Give feedback** and receive surveys except for new hires in training. In this scenario, you create a custom policy to turn off both features and assign it to new hires. All other users in your organization get the global policy with the features turned on.

You manage feedback policies by using PowerShell. Use the **New-CsTeamsFeedbackPolicy** cmdlet, *which can be found here*, to create a custom policy and the **Grant-CsTeamsFeedbackPolicy** cmdlet to assign it to one or more users or groups of users, such as a security group or distribution group.

To turn off and turn on the features, set the following parameters:

- **Give feedback**: Set the **userInitiatedMode** parameter to **enabled** to allow users who are assigned the policy to give feedback. Setting the parameter to **disabled** turns off the feature and users who are assigned the policy don't have the option to give feedback.
- **Surveys**: Set the **receiveSurveysMode** parameter to **enabled** to allow users who are assigned the policy to receive the survey. To have users receive the survey and allow them to opt out, set the parameter to **enabledUserOverride**. In Teams, users can then go to **Settings** > **Privacy** and choose whether they want to participate in surveys. Setting the parameter to **disabled** turns off the feature and users who are assigned the policy won't receive the survey.

Create a custom feedback policy

In this example, we create a feedback policy called New Hire Feedback Policy and we turn off the ability to give feedback through **Give feedback** and the survey.

```
New-CsTeamsFeedbackPolicy -identity "New Hire Feedback Policy" -userInitiatedMode disabled -receiveSurveysMode
disabled
```

Assign a custom feedback policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

In this example, we assign a custom policy named New Hire Feedback Policy to a user named user1.

```
Grant-CsTeamsFeedbackPolicy -Identity user1@contoso.com -PolicyName "New Hire Feedback Policy"
```

Related topics

- Teams PowerShell Overview
- Assign policies to your users in Teams

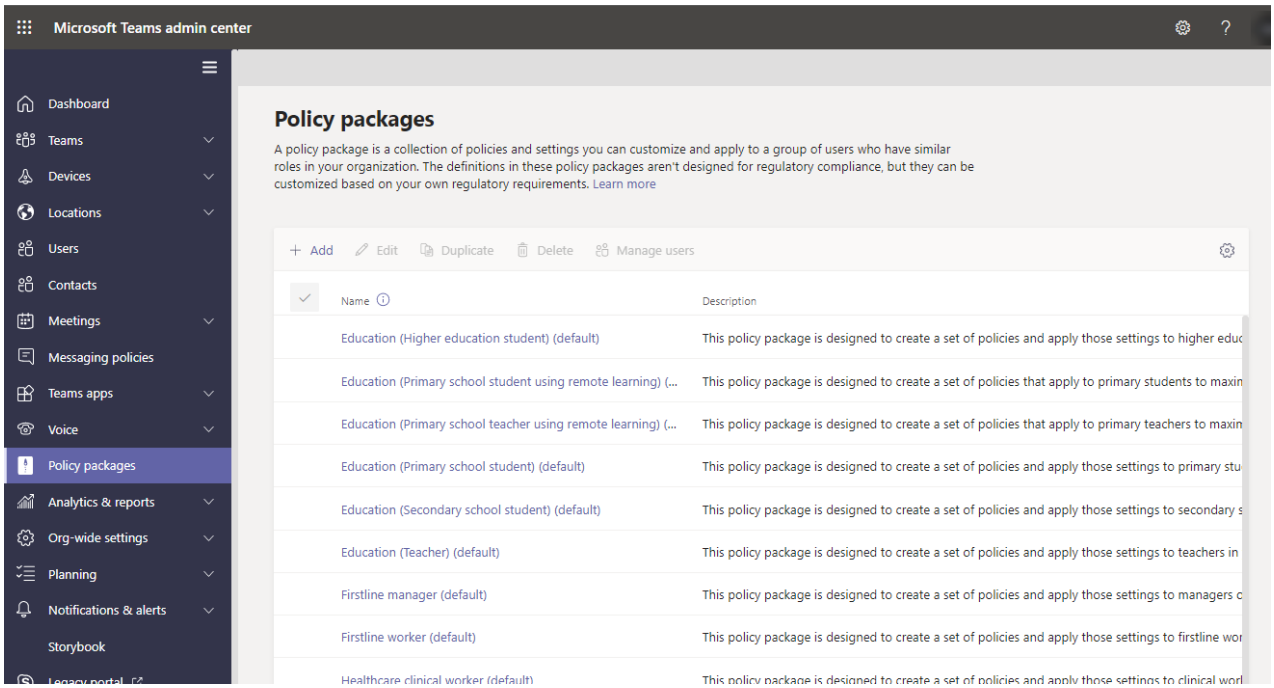
Manage policy packages in Microsoft Teams

12/5/2020 • 7 minutes to read • Edit Online

> **NOTE**
> One of the features discussed in this article, custom policy packages, is currently in private preview.

A policy package in Microsoft Teams is a collection of predefined policies and policy settings that you can assign to users who have similar roles in your organization. We built policy packages to simplify, streamline, and help provide consistency when managing policies for groups of users across your organization.

You can use the policy packages included in Teams or create your own custom policy packages (in private preview).



You can customize the settings of the policies in a policy package to suit the needs of your users. When you change the settings of policies in a package, all users who are assigned to that package get the updated settings. You manage policy packages by using the Microsoft Teams admin center or PowerShell.

What is a policy package?

Policy packages let you control Teams features that you want to allow or restrict for specific sets of people across your organization. Each policy package in Teams is designed around a user role and includes predefined policies and policy settings that support the collaboration and communication activities that are typical for that role.

Policy packages support the following Teams policy types:

- Messaging policy
- Meeting policy
- App setup policy
- Calling policy
- Live events policy

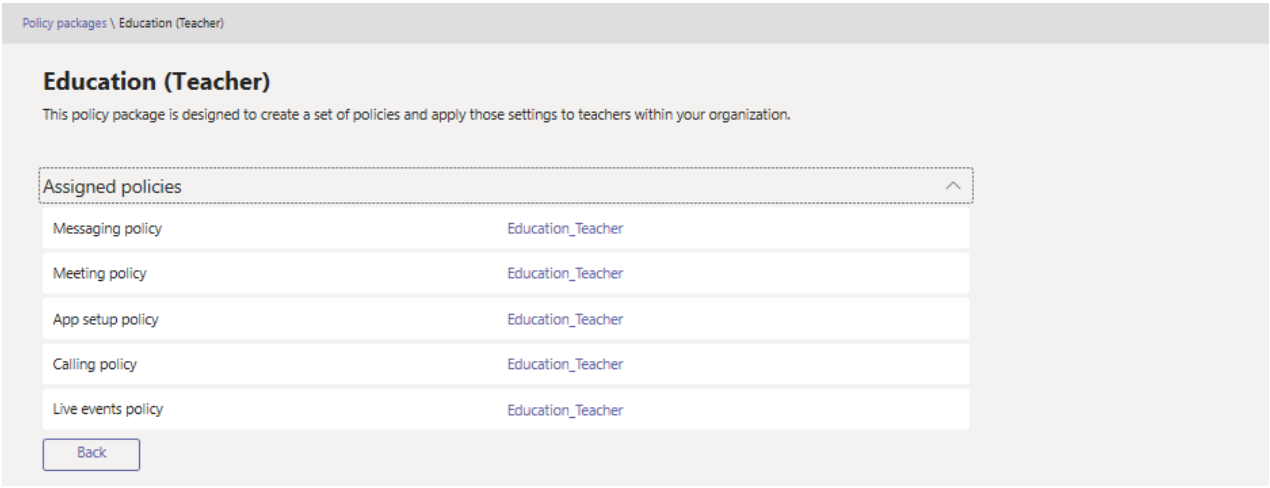
Policy packages included in Teams

Teams currently includes the following policy packages.

PACKAGE NAME	DESCRIPTION
Education (Higher education student)	Creates a set of policies and policy settings that apply to higher education students.
Education (Primary school student)	Creates a set of policies and policy settings that apply to primary students.
Education (Secondary school student)	Creates a set of policies and policy settings that apply to secondary students.
Education (Teacher)	Creates a set of policies and policy settings that apply to teachers.
Education (Primary school teacher using remote learning)	Creates a set of policies that apply to primary teachers to maximize student safety and collaboration when using remote learning.
Education (Primary school student using remote learning)	Creates a set of policies that apply to primary students to maximize student safety and collaboration when using remote learning.
Firstline manager	Creates a set of policies and applies those settings to Firstline Managers in your organization.
Firstline worker	Creates a set of policies and applies those settings to Firstline Workers in your organization.
Healthcare clinical worker	Creates a set of policies and policy settings that give clinical workers such as registered nurses, charge nurses, physicians, and social workers full access to chat, calling, shift management, and meetings.
Healthcare information worker	Creates a set of policies and policy settings that give information workers such as IT personnel, informatics staff, finance personnel, and compliance officers, full access to chat, calling, and meetings.
Healthcare patient room	Creates a set of policies and policy settings that apply to patient rooms in your healthcare organization.
Small and medium business user (Business Voice)	Creates an app setup policy that includes the apps for a business voice experience.
Small and medium business user (without Business Voice)	Creates an app setup policy relevant for a small and medium sized business Teams users (non-Business Voice experience).
Public safety officer	Creates a set of policies and policy settings that apply to public safety officers in your organization.

> **NOTE**
>
> We'll be adding more policy packages in future releases of Teams, so check back for the most up-to-date information.

Each individual policy is given the name of the policy package so you can easily identify the policies that are linked to a policy package. For example, when you assign the Education (Teacher) policy package to teachers in your school, a policy that's named Education_Teacher is created for each policy in the package.



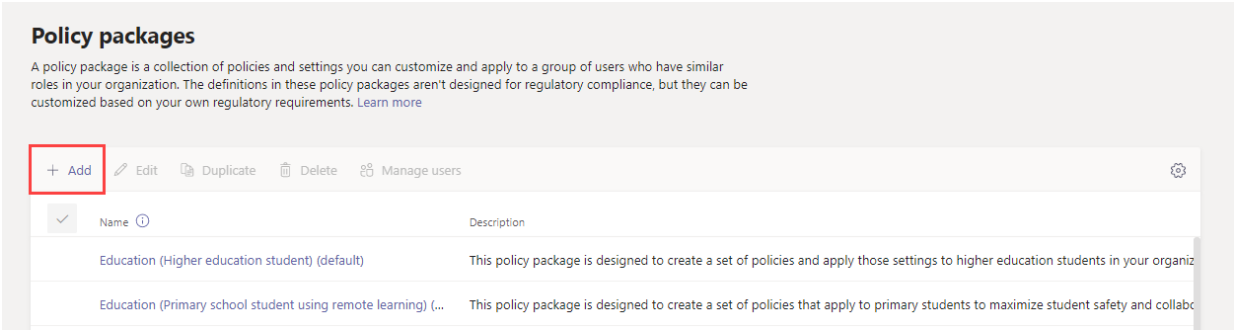
Custom policy packages

This feature is in private preview

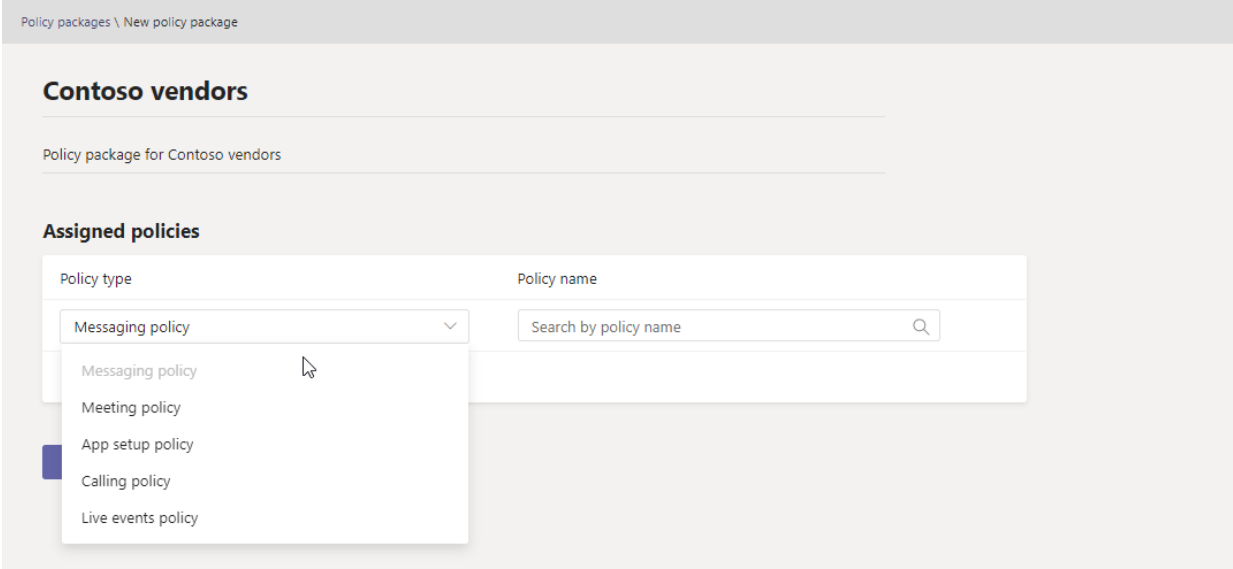
Custom policy packages let you bundle your own set of policies for users with similar roles in you organization. Create your own policy packages by adding the policy types and policies that you need.

To create a new custom policy package:

1. In the left navigation of the Microsoft Teams admin center, select **Policy packages**, and then click **Add**.



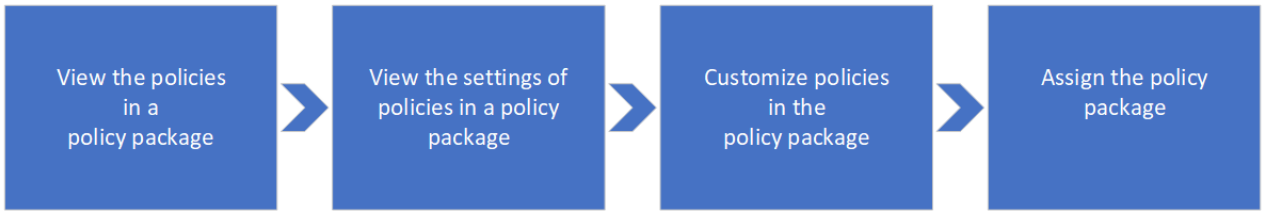
2. Enter a name and description for your package.



3. Select the policy types and policy names to include in the package.
4. Click **Save**.

How to use policy packages

The following outlines how to use policy packages in your organization.



- **View**: View the policies in a policy package. Then, view the settings of each policy in a package before you assign the package. Make sure that you understand each setting. Decide whether the predefined values are appropriate for your organization or whether you need to change them to be more restrictive or lenient based on your organization's needs.

  If a policy is deleted, you can still view the settings but you won't be able to change any settings. A deleted policy is re-created with the predefined settings when you assign the policy package.

- **Customize**: Customize the settings of policies in the policy package to fit the needs of your organization.

- **Assign**: Assign the policy package to users.

> **NOTE**
> You can also change the settings of policies in a policy package after you assign a package. Any changes you make to policy settings are automatically applied to users who are assigned the package.

Here are the steps for how to view, assign, and customize policy packages in the Microsoft Teams admin center.

View the settings of a policy in a policy package

1. In the left navigation of the Microsoft Teams admin center, select **Policy packages**, and then select a policy package by clicking to the left of the package name.
2. Click the policy you want to view.

Customize policies in a policy package

You can edit the settings of a policy through the **Policy packages** page or by going directly to the policy page in

the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, do one of the following:
   - Click **Policy packages**, and then select the policy package by clicking to the left of the package name.
   - Click the policy type. For example, click **Messaging policies**.
2. Select the policy you want to edit. Policies that are linked to a policy package have the same name as the policy package.
3. Make the changes that you want, and then click **Save**.

Assign a policy package

Assign a policy package to one user

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then click the user.
2. On the user's page, click **Policies**, and then next to **Policy package**, click **Edit**.
3. In the **Assign policy package** pane, select the package you want to assign, and then click **Save**.

Assign a policy package to multiple users

1. In the left navigation of the Microsoft Teams admin center, go to **Policy packages**, and then select the policy package you want to assign by clicking to the left of the package name.
2. Click **Manage users**.
3. In the **Manage users** pane, search for the user by display name or by user name, select the name, and then click **Add**. Repeat this step for each user that you want to add.
4. When you're finished adding users, click **Save**.

Assign a policy package to a group

This feature is in private preview

Policy package assignment to groups let you assign multiple policies to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly. This method is recommended for groups of up to 50,000 users but will also work with larger groups.

To learn more, see Assign a policy package to a group.

Assign a policy package to a large set (batch) of users

Use batch policy package assignment to assign a policy package to large sets of users at a time. You use the New-CsBatchPolicyPackageAssignmentOperation cmdlet to submit a batch of users and the policy package that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch.

A batch can contain up to 5,000 users. You can specify users by their object Id, UPN, SIP address, or email address. To learn more, see Assign a policy package to a batch of users.

Troubleshooting

You receive an error when you assign a policy package

This may occur if one or more policies in the package weren't created or applied successfully. Reassign the policy package to your users. Retrying the operation typically fixes this issue.

Related topics

Assign policies to your users in Teams

Teams policy packages for EDU admins

Teams policy packages for healthcare

Teams policy packages for government

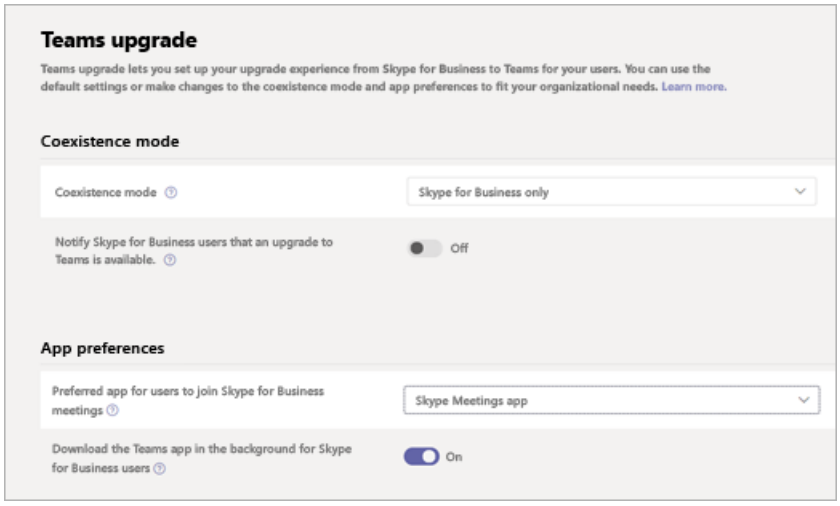
Configure the Skype Meetings App to work with Teams

8/6/2020 • 2 minutes to read • Edit Online

After a user is upgraded to Microsoft Teams, admins can use the Microsoft Teams admin center to specify the preferred app that users will use to join Skype for Business meetings.

To specify the Skype for Meetings App as the preferred app:

1. Sign in to the Microsoft Teams admin center.
2. In the left pane, under **Org-wide settings**, select **Teams upgrade**.
3. On the Teams upgrade page, under **App preferences**, select **Skype Meetings App** from the **Preferred app for users to join Skype for Business meetings** drop-down list.



Known limitations

Users who use the Skype Meetings App with Teams are subject to the following limitations:

- Users have no option to change their video device.
- After a user is upgraded to Teams, if the user is in a meeting using the Skype Meetings App and then receives a call on Teams, the meeting in Skype Meetings App is not placed on hold. Instead, the user is connected to both calls.

More information

- What is Skype Meetings App (Skype for Business Web App)
- Skype Meetings App minimum network requirements

Manage external access in Microsoft Teams

12/5/2020 • 7 minutes to read • Edit Online

External access is a way for Teams users from an entire external domain to find, call, chat, and set up meetings with you in Teams. You can also use external access to communicate with external users who are still using Skype for Business (online and on-premises) and Skype (in preview).

> **NOTE**
> The allowed or blocked domains only apply to meetings if anonymous access to meetings is "off".

If you want external users to have access to teams and channels, guest access might be a better way to go. For more information about the differences between external access and guest access, see Compare external and guest access.

Use external access when:

- You have users in different domains who need to collaborate. For example, Rob@contoso.com and Ann@northwindtraders.com are working on a project together along with some others in the contoso.com and northwindtraders.com domains.
- You want the people in your organization to use Teams to contact people in specific businesses outside of your organization.
- You want anyone else in the world who uses Teams to be able to find and contact you, using your email address.

> **IMPORTANT**
> To use the Teams client to communicate with an external user (whether that user is using Teams or Skype for Business), the Teams user must be homed in Skype for Business Online.

Plan for external access

By default, external access is turned on in Teams, which means that your organization can communicate with all external domains. If you add blocked domains, all other domains will be allowed; and if you add allowed domains, all other domains will be blocked. The exception to this rule is if anonymous participants are allowed in meetings. There are three scenarios for setting up external access in the Teams admin center (**Org-wide settings** > **External access**):

- **Open federation**: This is the default setting in Teams, and it lets people in your organization find, call, chat, and set up meetings with people external to your organization in any domain.

  In this scenario, your users can communicate with all external domains that are running Teams or Skype for Business AND are using open federation OR have added your domain to their allow list.

- **Allow specific domains**: By adding domains to an **Allow** list, you limit external access to only the allowed domains. Once you set up a list of allowed domains, all other domains will be blocked. To allow specific domains, click **Add a domain**, add the domain name, click **Action to take on this domain**, and then select **Allowed**.

- **Block specific domains** - By adding domains to a **Block** list, you can communicate with all external domains *except* the ones you've blocked. To block specific domains, click **Add a domain**, add the domain name, click **Action to take on this domain**, and then select **Blocked**. Once you set up a list of blocked domains, all other domains will be allowed.

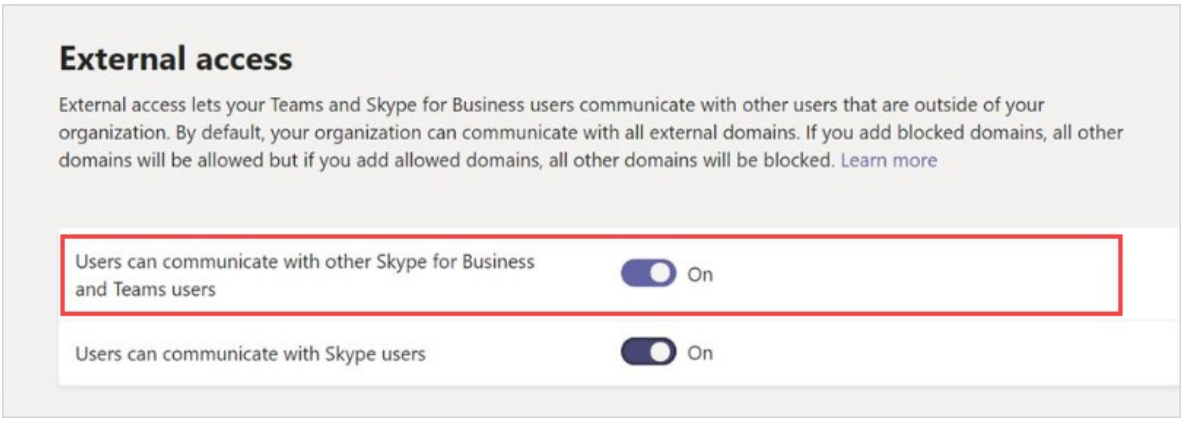
> **NOTE**
> If you turn off external access in your organization, external users can still join meetings through anonymous join. To learn more, see Manage meeting settings in Teams.

Allow or block domains

Step 1 - Enable your organization to communicate with another Teams or Skype for Business organizations

Using the Microsoft Teams admin center

1. In the left navigation, go to **Org-wide settings** > **External access**.
2. Turn on the **Users can communicate with other Skype for Business and Teams users** setting.



.

3. If you want to allow all Teams organizations to communicate with users in your organization, skip to step 5.
4. If you want to limit the organizations that can communicate with users in your organization, you can either allow all except some domains, or you can allow only specific domains.
   - To allow all except some domains, add the domains you want to block by clicking **Add domain**. In the **Add a domain** pane, type the domain name, click **Blocked**, and then click **Done**.
   - To limit communications to specific organizations, add those domains to the list with a status of **Allowed**. Once you have added any domain to the Allow list, communications with other organizations will be limited to only those organizations whose domains are in the Allow list.
5. Click **Save**.
6. Make sure the admin in the other Teams organization completes these same steps. For example, in their **allowed domains** list, their admin needs to enter the domain for your business if they limit the organizations that can communicate with their users.

Step 2 - Test it

To test your setup, you need a Teams user who's not behind your firewall.

1. After you and the admin from the organization have changed the **External access** settings, you should be good to go.

2. In the Teams app, search for the person by email address, and send a request to chat.
3. Ask your Teams contact to send you a request to chat. If you don't receive their request, the problem is your firewall settings (assuming they've already confirmed their firewall settings are correct).
4. Another way to test whether the problem is your firewall is to go to a WiFi location not behind your firewall. such as a coffee shop, and use Teams to send a request to your contact to chat. If the message goes through at the WiFi location, but does not when you're at work, then you know the problem is your firewall.

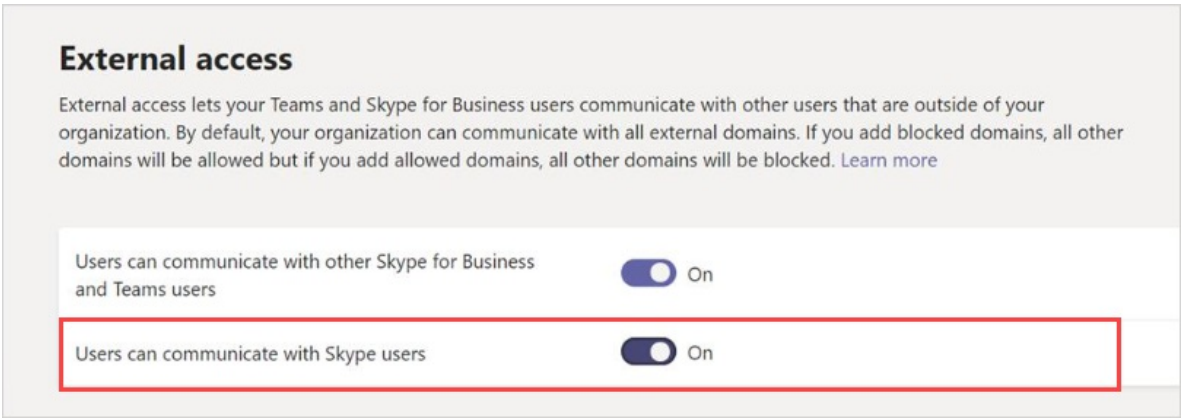
> **NOTE**
> If you and another user both turn on external access and allow one another's domains, this will work. If it doesn't work, the other user should make sure their configuration isn't blocking your domain.

Communicate with Skype users (in preview)

Follow these steps to let Teams users in your organization chat with and call Skype users. Teams users can then search for and start a one-on-one text-only conversation or an audio/video call with Skype users and vice versa.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Org-wide settings** > **External access**.
2. Turn on the **Users can communicate with Skype users** setting.



.

To learn more about the ways that Teams users and Skype users can communicate, including limitations that apply, see Teams and Skype interoperability.

Common external access scenarios

The following sections describe how to enable federation for common external access scenarios, and how the TeamsUpgradePolicy determines delivery of incoming chats and calls.

Enable federation

To enable users in your organization to communicate with users in another organization, both organizations must enable federation. The steps to enable federation for a given organization depend on whether the organization is purely online, hybrid, or purely on-premises.

IF YOUR ORGANIZATION IS	ENABLE FEDERATION AS FOLLOWS
Online with no Skype for Business on-premises. This includes organizations that have TeamsOnly users and/or Skype for Business Online users.	If using Teams Admin Center: - Make sure the **Users can communicate with other Skype for Business and Teams users** setting is enabled in External Access. - If you are not using open federation (which allows federation with any other domain), then add the external domain to the Allowed list. If using PowerShell: - Ensure the tenant is enabled for federation: `Get-CsTenantFederationConfiguration` must show `AllowFederatedUsers=true`. - Ensure the user's effective value of `CsExternalAccessPolicy` has `EnableFederationAccess=true`. - If you are not using open federation, ensure the target domain is listed in `AllowedDomains` of `CsTenantFederationConfiguration`.
Pure on-premises	In on-premises tools: - Ensure federation is enabled in `CsAccessEdgeConfiguration`. - Ensure federation for the user is enabled through `ExternalAccessPolicy` (either through the global policy, site policy, or user assigned policy). - If you are not using open federation, ensure the target domain is listed in `AllowedDomains`.
Hybrid with some users online (in either Skype for Business or Teams) and some users on-premises.	Follow above steps for both online and on-premises organizations.

Delivery of incoming chats and calls

Incoming chats and calls from a federation organization will land in the user's Teams or Skype for Business client depending on the recipient user's mode in TeamsUpgradePolicy.

IF YOU WANT TO	DO THIS:
Ensure incoming federated chats and calls arrive in the user's Teams client:	Configure your users to be TeamsOnly.
Ensure incoming federated chats and calls arrive in the user's Skype for Business client	Configure your users to be in any mode other than TeamsOnly.

Enable federation between users in your organization and consumer users of Skype

To enable federation between users in your organization and consumer users of Skype:

IF YOUR ORGANIZATION IS	ENABLE CONSUMER FEDERATION AS FOLLOWS

IF YOUR ORGANIZATION IS	ENABLE CONSUMER FEDERATION AS FOLLOWS
Pure online with no Skype for Business on-premises. This includes organizations that have TeamsOnly users and/or Skype for Business Online users.	If using Teams Admin Center: -Make sure **Users can communicate with Skype users** is enabled in External Access. If using PowerShell: -Ensure the tenant is enabled for federation: `Get-CsTenantFederationConfiguration` must show `AllowPublicUsers=true`. - Ensure the user's effective value of `CsExternalAccessPolicy` has `EnablePublicCloudAccess=true`.
Pure on-premises	In on-premises tools: - Ensure Skype is enabled as a federated partner. - Ensure `EnablePublicCloudAccess=true` for the user through `ExternalAccessPolicy` (either via global policy, site policy, or user assigned policy).
Hybrid with some users online (in either Skype for Business or Teams) and some users on-premises.	Follow above steps for both online and on-premises organizations.

IMPORTANT

You don't have to add any **Skype domains** as allowed domains in order to enable Teams or Skype for Business Online users to communicate with Skype users inside or outside your organization. All **Skype domains** are whitelisted, which means all of these domains are considered ALLOWED.

How does external access compare with guest access?

To learn about the difference between external access and guest access, read Communicate with users from other organizations.

Related topics

- Native chat experience for external (federated) users

Turn off inline message translation in Microsoft Teams

9/4/2020 • 2 minutes to read • Edit Online

Inline message translation is a Microsoft Teams feature that lets users translate Teams messages into the language specified by their personal language settings.

Inline message translation is rolled out by default for your organization. You don't need to make changes if you want to allow users to use this feature within the Teams client.

> **NOTE**
> This rollout is excluded from Office 365 subscriptions in our Office 365 Government Community Cloud and Office 365 Germany environments.

Use PowerShell to turn off inline message translation

You can use the messaging policy to turn off the inline message translation.

Turn off the policy by using the Set-CsTeamsMessagingPolicy cmdlet. The policy takes a few minutes to apply. Users might need to sign out and sign back in to Teams.

Use the Microsoft Teams admin center to turn off inline message translation

In the **Microsoft Teams admin center**, select **Messaging Policies** from the left navigation, then either create a new policy or edit an existing policy, and set the **Translate messages** option to **Off**.

> **NOTE**
> The service does the translation and delivers it to the client with no effect on the content captured in the compliance records. To learn more about translation, see What is Microsoft Translator?

Use Microsoft Teams scoped directory search

8/6/2020 • 2 minutes to read • Edit Online

Microsoft Teams scoped directory search allows organizations to create virtual boundaries that control how users can find and communicate with other users in their organization.

Microsoft Teams lets organizations provide custom views of the directory to their users. Microsoft Teams uses Information Barrier policies to support these custom views. Once the policies are enabled, the results returned by searches for other users (for example, to initiate a chat or to add members to a team) will be scoped according to the configured policies. Users will not be able to search or discover teams when scoped search is in effect.

> **NOTE**
> In Exchange hybrid environments, this feature only works with Exchange Online mailboxes, and not with on-premises mailboxes.

When should you use scoped directory searches?

Scenarios that benefit from scoped directory searches are similar to address book policy scenarios. For example, you may want to use scoped directory search in the following situations:

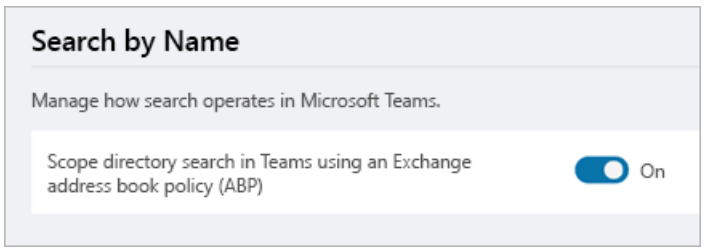
- Your organization has multiple companies within its tenant that you want to keep separate.
- Your school wants to limit chats between faculty and students.

To learn how to use address book policies, read Information Barrier policies in Exchange Online.

> **IMPORTANT**
> Address book policies provide only a virtual separation of users from directory perspective. Users can still initiate communications with others by providing complete email addresses. It is also important to note that any user data that had already been cached, prior to the enforcement of new or updated address book policies, will remain available to users for up to 30 days.

Turn on scoped directory search

1. Use Information Barrier policies to configure your organization into virtual subgroups. For more information, see Define Information Barrier policies.
2. In the Microsoft Teams admin center, select **Org-wide settings** > **Teams settings**.
3. Under **Search**, next to **Scope directory search in Teams using an Exchange address book policy (ABP)**, turn the toggle **On**.



IMPORTANT

This change can take a few hours to replicate.

Microsoft Teams analytics and reporting

11/2/2020 • 2 minutes to read • Edit Online

A new analytics and reporting experience for Microsoft Teams is available in the Microsoft Teams admin center. You can run different reports to get insights into how users in your organization are using Teams. For example, you can see how many users communicate through channel and chat messages and the kinds of devices they use to connect to Teams. Your organization can use the information from the reports to better understand usage patterns, help make business decisions, and inform training and communication efforts.

How to access the reports

To access the reports, you must be a global admin in Microsoft 365 or Office 365, Teams service admin, or Skype for Business admin. To learn more about Teams admin roles and which reports each admin role can access, see Use Teams administrator roles to manage Teams.

Go to the Microsoft Teams admin center, in the left navigation, select **Analytics & reports**, and then under **Report**, choose the report you want to run.

> **NOTE**
> The reports in the Microsoft Teams admin center are separate from the activity reports for Teams that are part of the Microsoft 365 reports in the Microsoft 365 admin center. For more information about the activity reports in the Microsoft 365 admin center, see Teams activity reports in the Microsoft 365 admin center

Teams reporting reference

Here's a list of the Teams reports available in the Microsoft Teams admin center and an overview of some of the information that's available in each report.

We're continually improving the Teams reporting experience and adding features and functionality. Over time, we'll be building additional capabilities into the reports and adding new reports in the Microsoft Teams admin center.

REPORT	WHAT'S MEASURED?
Teams usage report	Active users Active users in teams and channels Active channels Messages Privacy setting of teams Guests in a team
Teams user activity report	1:1 calls a user participated in Messages a user posted in a team chat Messages a user posted in a private chat Last activity date of a user
Teams device usage report	Windows users Mac users iOS users Android phone users

REPORT	WHAT'S MEASURED?
Teams live event usage report	Total views Start time Event status Organizer Presenter Producer Recording setting Production type
Teams PSTN blocked users report	Display name Phone number Reason Action type Action date and time
Teams PSTN minute pools report	Country or region Capability (license) Total minutes Minutes used Minutes available
Teams PSTN usage report - Calling Plans	Time stamp User name Phone number Call type Called to To country or region Called from From country or region Charge Currency Duration Domestic/International Call ID Number type Country or region Conference ID Capability (license)
Teams PSTN usage report - Direct Routing	Time stamp Display name SIP address Phone number Call type Called to Start time Invite time Failure time End time Duration Number type Media bypass SBC FQDN Azure region Event type Final SIP code Final Microsoft subcode Final SIP phrase Correlation ID

Definitions

The Teams reports show data for active users and active channels. For example, if a user in your organization isn't active in Teams during the date range that you specified for a report, data for that user isn't included in that report.

ITEM	DEFINITION
Active user	Measures the number of unique users who perform an action in Teams during the specified date range.
Active channel	Measures the number of channels of a team in which users perform an action during the specified date range.

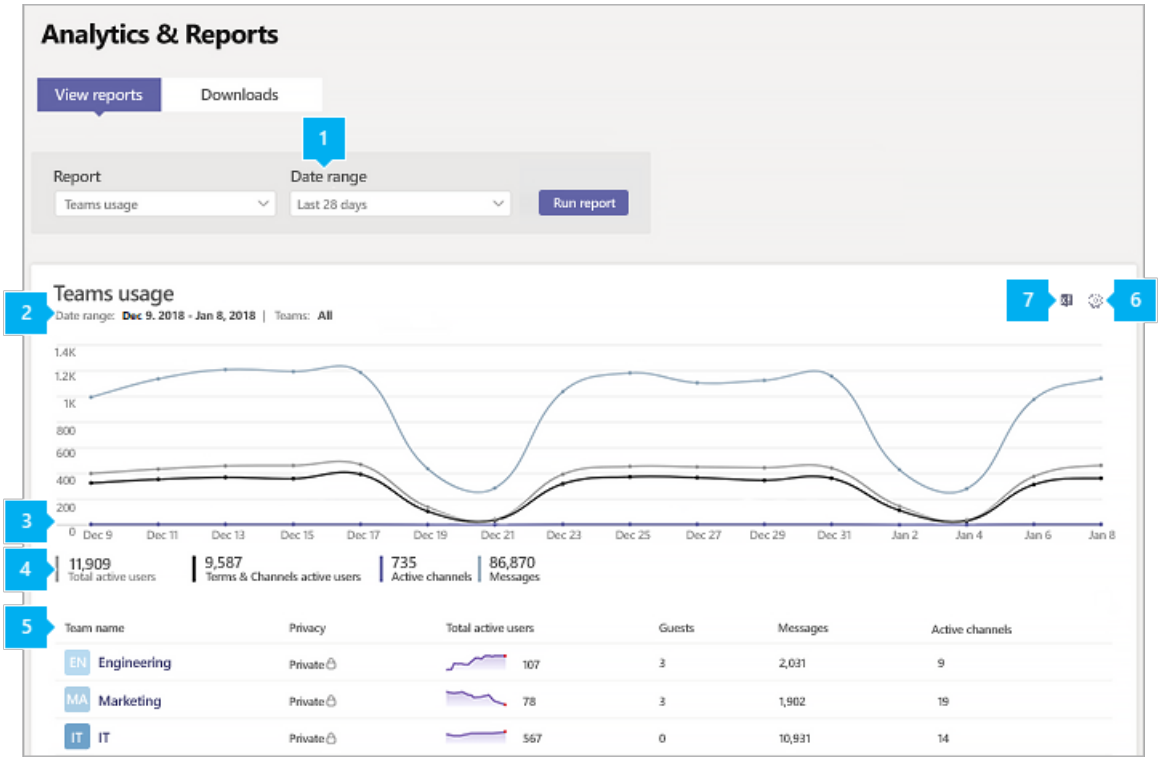
Microsoft Teams usage report

7/31/2020 • 3 minutes to read • Edit Online

The Teams usage report in the Microsoft Teams admin center gives you an overview of the usage activity in Teams, including the number of active users and channels, so you can quickly see how many users across your organization are using Teams to communicate and collaborate. You can view usage information for teams, including the number of active users and channels, guests, and messages in each team.

View the usage report

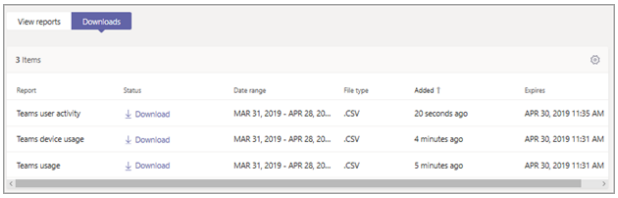
1. In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **Teams usage**.
2. Under **Date range**, select a range, and then click **Run report**.



Interpret the report

CALLOUT	DESCRIPTION
1	The Teams usage activity report can be viewed for trends over the last 7 days, 30 or 90 days.
2	Each report has a date for when this report was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.

CALLOUT	DESCRIPTION
3	• The X axis on the chart is the selected date range for the report. • The Y axis is the count of active items or activity. Hover over the dot representing an item or activity on a given date to see the number of instances of that item or activity on that given date.
4	You can filter what you see on the chart by clicking an item in the legend. For example, click **Total active users**, **Teams & Channels active users**, **Active channels**, or **Messages** to see only the info related to each one. Changing this selection doesn't change the information in the table.
5	The table gives you a breakdown of usage by team. • **Team name** is the display name of the team. You can click the team name to go to the team's settings page in the Microsoft Teams admin center. • **Privacy** refers to whether the team is a private team or public team. • **Active users** is the number of active users in the team in the specified time period. • **Guests** is the number of guests in the team in the specified time period. • **Active channels** is the number of channels that have at least one active user in the specified time period. • **Post Messages** is the number of all the post messages in channels in the specified time period. • **Reply messages** is the number of all the reply messages in channels in the specified time period. • **Meetings organized** is the number of scheduled and ad hoc meetings a user organized during the specified time period. • **Urgent messages** is the number of all the urgent messages in the specified time period. • **Reactions** is the number of all the reactions to messages in the specified time period. • **Mentions** is the number of all the mentions used in messages in the specified time period. • **Channel messages** is the number of unique messages that the team's users posted in a team chats during the specified time period. Note that if a user account no longer exists in Azure AD, the user name is displayed as "--" in the table. To see the information that you want in the table, make sure to add the columns to the table.
6	Select **Edit columns** to add or remove columns in the table.

CALLOUT	DESCRIPTION
7	You can export the report to a CSV file for offline analysis. Click **Export to Excel**, and then on the **Downloads** tab, click **Download** to download the report when it's ready. 

Definitions

The Teams reports show data for active users and active channels. For example, if a user in your organization isn't active in Teams during the date range that you specified for a report, data for that user isn't included in that report.

ITEM	DEFINITION
Active user	Measures the number of unique users who perform an action in Teams during the specified date range.
Active channel	Measures the number of channels of a team in which users perform an action during the specified date range.

Related topics

- Teams analytics and reporting

Microsoft Teams user activity report

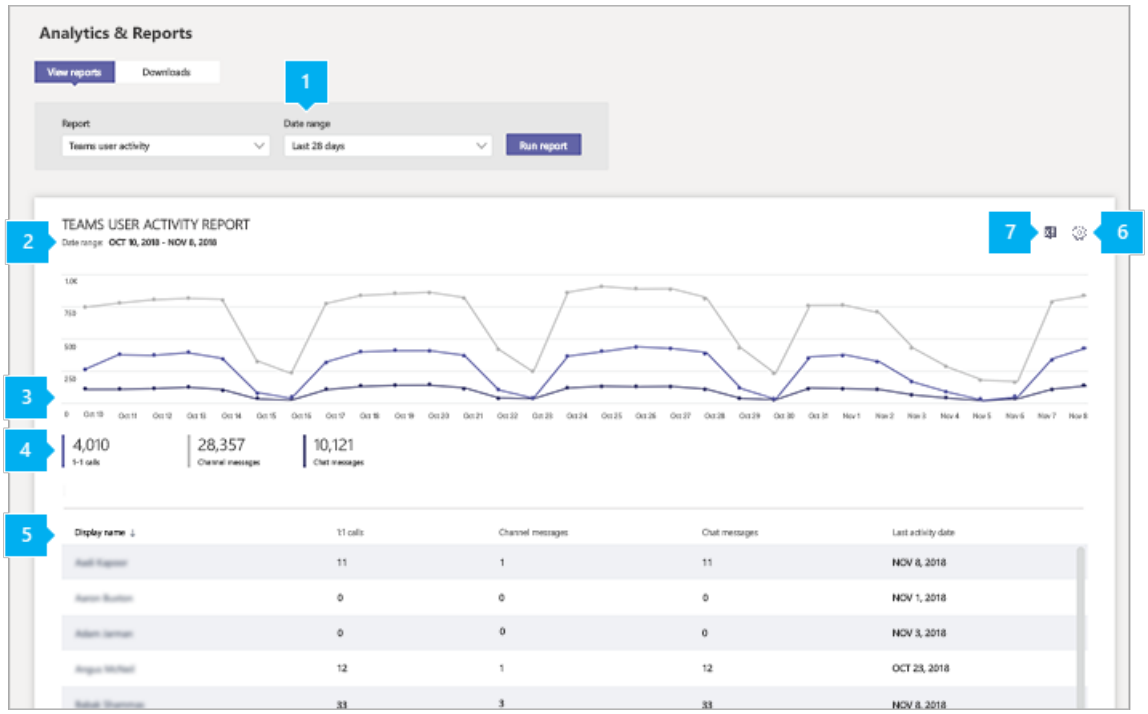
9/18/2020 • 4 minutes to read • Edit Online

The Teams user activity report gives insight into the types of activities that users in your organization perform in Teams. For example, one can see how many users communicate on an ad hoc basis through unscheduled meetings commonly referred to as 1:1 and group calls, meetings a Teams user has organized, and meetings a Teams user participated in. We share details about screen, video, and audio minutes, and chat communication statistics, such as how many users reply to and post channel messages, and how many users engage in 1:1 or group chat messages.

View the user activity report

You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

1. In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **Teams user activity**.
2. Under **Date range**, select a range, and then click **Run report**.

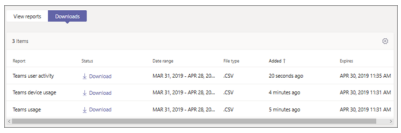


Interpret the report

CALLOUT	DESCRIPTION	
1	The Teams user activity report can be viewed for trends over the last 7 days, 30 or 90 days.	
2	Each report has a date for when this report was generated. The reports usually reflect a 24 hour latency from time of activity.	

CALLOUT	DESCRIPTION	
3	• The X axis on the charts is the selected date range for the specific report. • The Y axis is the number of users participating in the activity. Hover over the dot representing an activity on a given date to see the number of instances of that activity on that given date.	
4	You can filter what you see on the chart by clicking an item in the legend. For example, click **1:1 calls**, **Channel messages**, or **Chat messages** to see only the info related to each one. Changing the selection doesn't change the information in the table.	
5	The table gives you a breakdown of usage by user. • **Username** is the display name of the user. You can click the display name to go to the user's setting page in the Microsoft Teams admin center. • **Channel messages** is the number of unique messages that the user posted in a team chat during the specified time period. • **Reply messages** is the number of unique reply messages that the user posted in a team channel during the specified time period. • **Post messages** is the number of unique post messages that the user posted in a team channel during the specified time period. • **Chat messages** is the number of unique messages that the user posted in a private chat during the specified time period. • **Urgent messages** is the number of urgent messages that the user posted in a chat during the specified time period. • **Total meetings** is the total number of scheduled and ad hoc meetings a user participated in during the specified time period. • **Meetings organized** is the number of scheduled and ad hoc meetings a user organized during the specified time period. • **Meetings organized**	

CALLOUT	DESCRIPTION	
	scheduled is the number of scheduled meetings a user organized during the specified time period. • **Meetings organized adhoc** is the number of ad hoc meetings a user organized during the specified time period. • **Meetings participated** is the number of the scheduled and the ad hoc meetings a user participated in during the specified time period. • **Meetings participated scheduled** is the number of the scheduled meetings a user participated in during the specified time period. • **Meetings participated adhoc** is the number of ad hoc meetings a user participated in during the specified time period. • **1:1 calls** is the number of 1:1 calls that the user participated in during the specified time period. • **Audio time** is the total audio time that the user participated in during the specified time period. • **Video time** is the total video time that the user participated in during the specified time period. • **Screen sharing time** is the total screen share time that the user participated in during the specified time period. • **Last activity** is the last date (UTC) that the user participated in a Teams activity. • **Other activity** tracks when the user is considered active but has a value of zero for chat messages, 1:1 calls, channel messages, total meetings, and meetings organized. Examples actions are when a user opens a channel message post but doesn't reply to it or when a user receives a private message and reads it but doesn't respond to it. Note that **Group calls** has been replaced by **Meetings organized adhoc** and **Meetings participated adhoc**, in which the sum of these two values is equal to what was measured by **Group calls**.	
6	Select **Edit columns** to add or remove columns in the table.	

CALLOUT	DESCRIPTION	
7	You can export the report to a CSV file for offline analysis. Click **Export to Excel**, and then on the **Downloads** tab, click **Download** to download the report when it's ready.  When you view the report in Excel, you'll also see an **Id** column, which represents the team ID. A team ID is typically an alphanumeric string. If the **Id** column shows as **\n**, this means that a user requested their information to be deleted.	

Definitions

The Teams reports show data for active users and active channels. For example, if a user in your organization isn't active in Teams during the date range that you specified for a report, data for that user isn't included in that report.

ITEM	DEFINITION
Active user	Measures the number of unique users who perform an action in Teams during the specified date range.
Active channel	Measures the number of channels of a team in which users perform an action during the specified date range.

Related topics

- Teams analytics and reporting

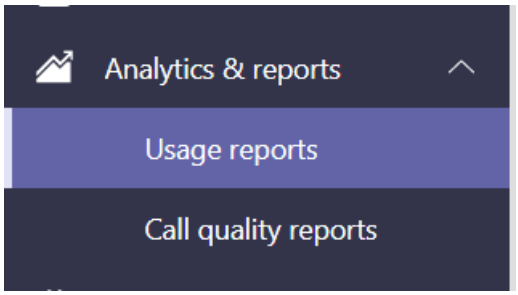
Microsoft Teams app usage report

8/6/2020 • 2 minutes to read • Edit Online

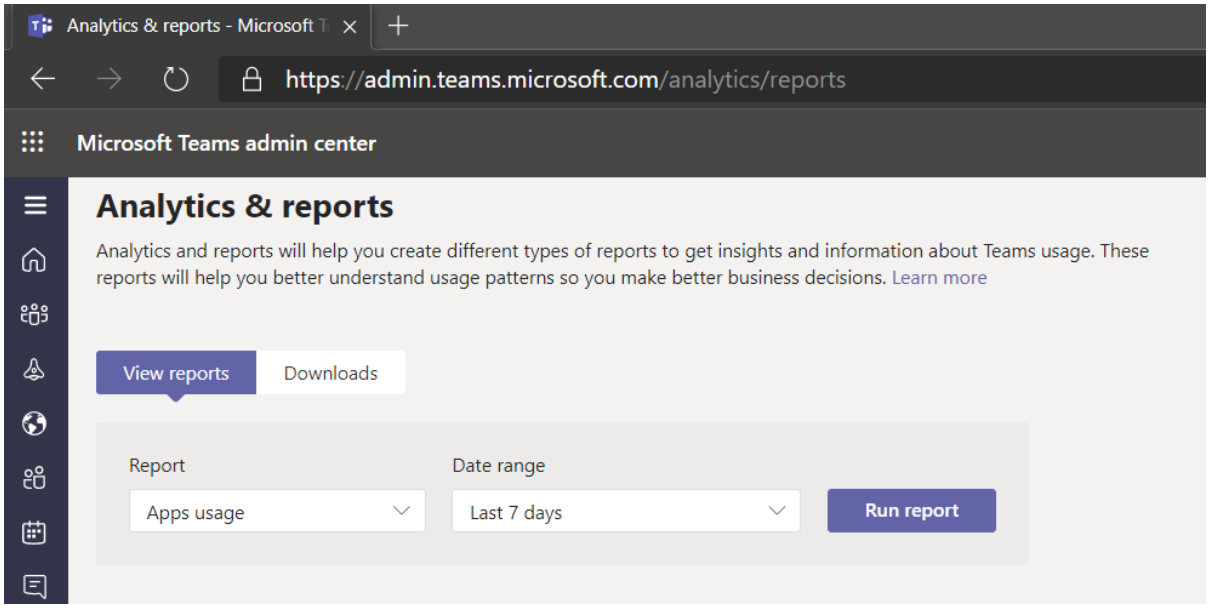
The Teams app usage report in the Microsoft Teams admin center provides you with information about which apps users are using in Teams.

View the App Usage report

1. In the left navigation of the admin center at https://admin.teams.microsoft.com, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **Apps Usage**.

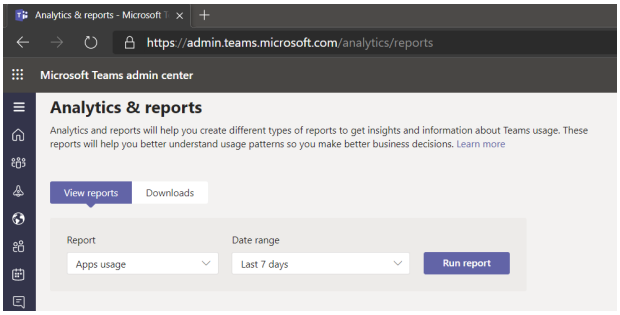
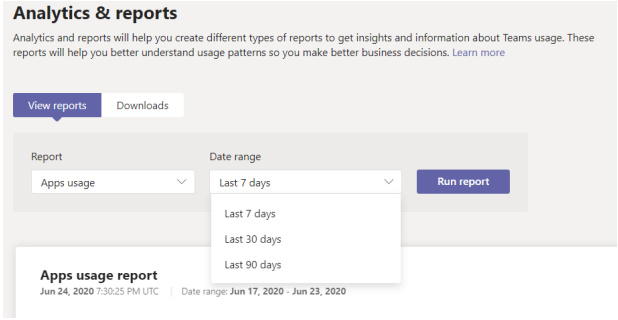


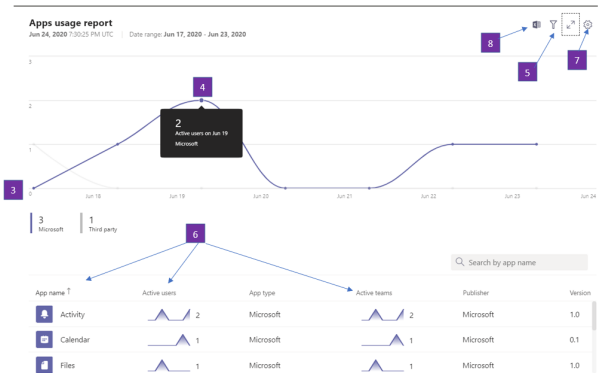
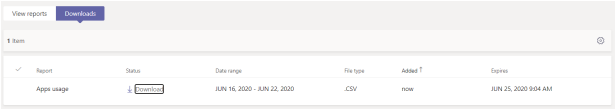
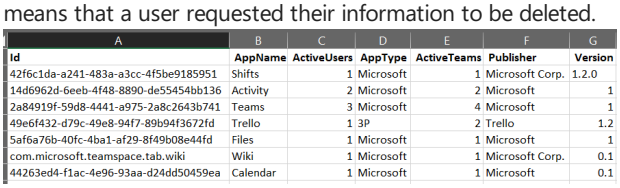
2. Under **Date range**, select a range, and then click **Run report**.



Interpret the report

CALLOUT	DESCRIPTION
1	The Teams Apps usage report can be viewed for trends over the last 7, 30 or 90 days.

CALLOUT	DESCRIPTION
2	Each report has a date for when the report was generated. The reports usually reflect a 24-hour latency from the time an app was opened. 
3	• The X axis on the charts is the selected date range for the specific report. • The Y axis is the number of users who for the given day hovered over in chart, those users have opened an app at least once and by doing so are considered an Active User and accrue towards the total seen on mouse hover over.
4	Hover over the dot representing an Apps Usage on a given date to see the number of instances of that App's Total Active Users on that given date.
5	All Apps will be included but by choosing the Filter icon, additional filters are available.
6	The table gives you a breakdown of active users and teams by App name. • **App name** is the display name of the app used in Teams. • **Active users** is the number of users who opened the app at least once during the specified time period. • **App type** is a static value of either "Microsoft" or "Third Party". • **Active teams** is the number of teams who have opened the App by at least one member of the team and during the specified time periods. • **Publisher** is the software publisher of the app. • **Version** is the software version of the app, from the app publisher. 

CALLOUT	DESCRIPTION
7	Select **Edit columns** to add or remove columns in the table. 
8	You can export the report to a CSV file for offline analysis. Click **Export to Excel**, and then on the **Downloads** tab, click **Download** to download the report when it's ready. 
9	When you view the report in Excel, you'll also see an **Id** column, which represents the app ID. A team ID is typically an alphanumeric string. If the **Id** column shows as **\n****, this means that a user requested their information to be deleted. 

A	B	C	D	E	F	G
Id	**AppName**	**ActiveUsers**	**AppType**	**ActiveTeams**	**Publisher**	**Version**
42f6c1da-a241-483a-a3cc-4f5be9185951	Shifts	1	Microsoft	1	Microsoft Corp.	1.2.0
14d6962d-6eeb-4f48-8890-de55454bb136	Activity	2	Microsoft	2	Microsoft	1
2a84919f-59d8-4441-a975-2a8c2643b741	Teams	3	Microsoft	4	Microsoft	1
49e6f432-d79c-49e8-94f7-89b94f3672fd	Trello	1	3P	2	Trello	1.2
5af6a76b-40fc-4ba1-af29-8f49b08e44fd	Files	1	Microsoft	1	Microsoft	1
com.microsoft.teamspace.tab.wiki	Wiki	1	Microsoft	1	Microsoft Corp.	0.1
44263ed4-f1ac-4e96-93aa-d24dd50459ea	Calendar	1	Microsoft	1	Microsoft	0.1

Related topics

- Teams analytics and reporting

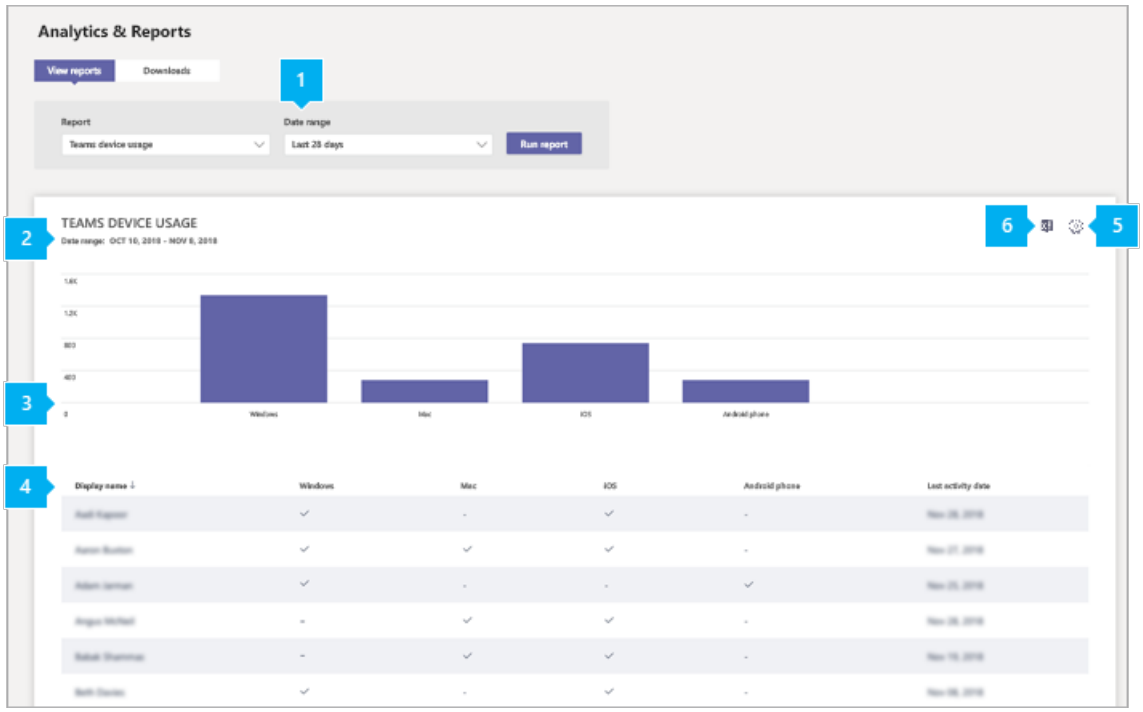
Microsoft Teams device usage report

7/31/2020 • 2 minutes to read • Edit Online

The Teams device usage report in the Microsoft Teams admin center provides you with information about how users connect to Teams. You can use the report to see the devices that are used across your organization, including how many use Teams from their mobile devices when on-the-go.

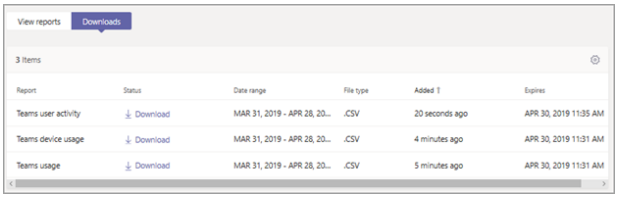
View the device usage report

1. In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **Teams device usage**.
2. Under **Date range**, select a range, and then click **Run report**.



Interpret the report

CALLOUT	DESCRIPTION
1	The Teams device usage report can be viewed for trends over the last 7 days or 30 days.
2	Each report has a date for when the report was generated. The reports usually reflect a 24 hour latency from time of activity.

CALLOUT	DESCRIPTION
3	• The X axis on the chart represents the different devices (**Windows**, **Mac**, **Linux**, **iOS**, **Android Phone**, **Web**) used to connect to Teams. • The Y axis is the number of users using the device over the selected time period. Hover over the bar representing a device to see the number of users using the device to connect to Teams.
4	The table gives you a breakdown of device usage by user. • **Username** is the display name of the user. You can click the display name to go to the user's setting page in the Microsoft Teams admin center. • **Windows** is selected if the user was active in the Teams desktop client on a Windows-based computer. • **Mac** is selected if the user was active in the Teams desktop client on a macOS computer. • **Linux** is selected if the user was active in the Teams desktop client on a Linux computer. • **iOS** is selected if the user was active on the Teams mobile client for iOS. • **Android phone** is selected if the user was active on the Teams mobile client for Android. • • **Web** is selected if the user was active on the Teams web client. • **Last activity** is the last date (UTC) that the user participated in a Teams activity. Note that if a user account no longer exists in Azure AD, the user name is displayed as "--" in the table. To see the information that you want in the table, make sure to add the columns to the table.
5	Select **Edit columns** to add or remove columns in the table.
6	You can export the report to a CSV file for offline analysis. Click **Export to Excel**, and then on the **Downloads** tab, click **Download** to download the report when it's ready. 

Related topics

- Teams analytics and reporting

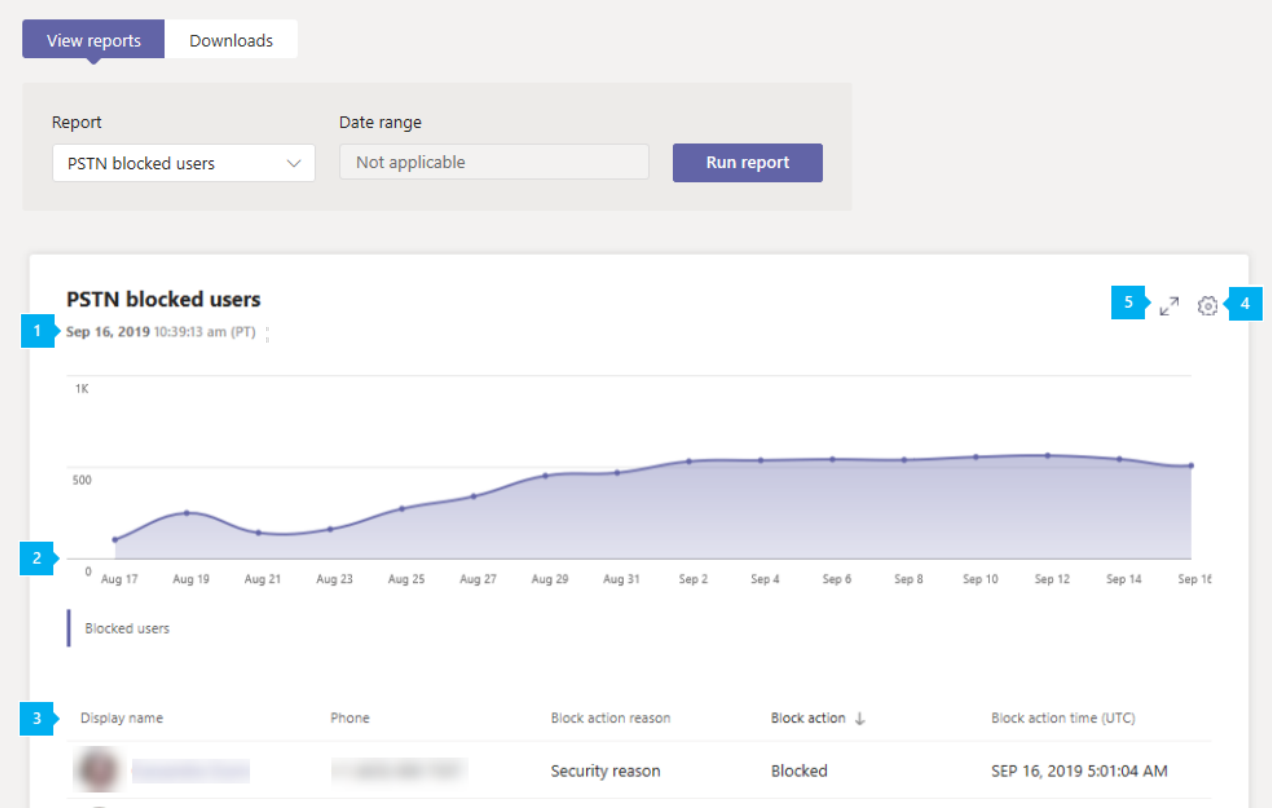
Microsoft Teams PSTN blocked users report

4/27/2020 • 2 minutes to read • Edit Online

The PSTN blocked users report in the Microsoft Teams admin center shows you the users in your organization who are blocked from making PSTN calls in Teams. You can view more information about each blocked user, including their assigned phone number and the reason they were blocked from making calls.

View the PSTN blocked users report

In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **PSTN blocked users**, and then click **Run report**.



Interpret the report

CALLOUT	DESCRIPTION
1	Each report has a date for when it was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.
2	The X axis is the date. The Y axis is the number of users. Hover over the dot on a given date to see the number of users blocked on that date.

CALLOUT	DESCRIPTION
3	The table gives a breakdown of all users who are blocked from making PSTN calls. It shows all users who have Phone System or Audio Conferencing assigned and gives you more information about each user. • **Display name** is the display name of the user. You can click the display name to go to the user's setting page in the Microsoft Teams admin center. • **Phone** is the number that's assigned to the user. • **Blocked reason** is the reason the user is blocked from making calls. • **Blocked action** tells you whether the user is blocked or unblocked from making PSTN calls in Teams. • **Blocked time** is the date and time (UTC) that the user was blocked from making calls. To see the information that you want in the table, make sure to add the columns to the table.
4	Select **Edit columns** to add or remove columns in the table.
5	Select **Full screen** to view the report in full screen mode.

Related topics

- Teams analytics and reporting

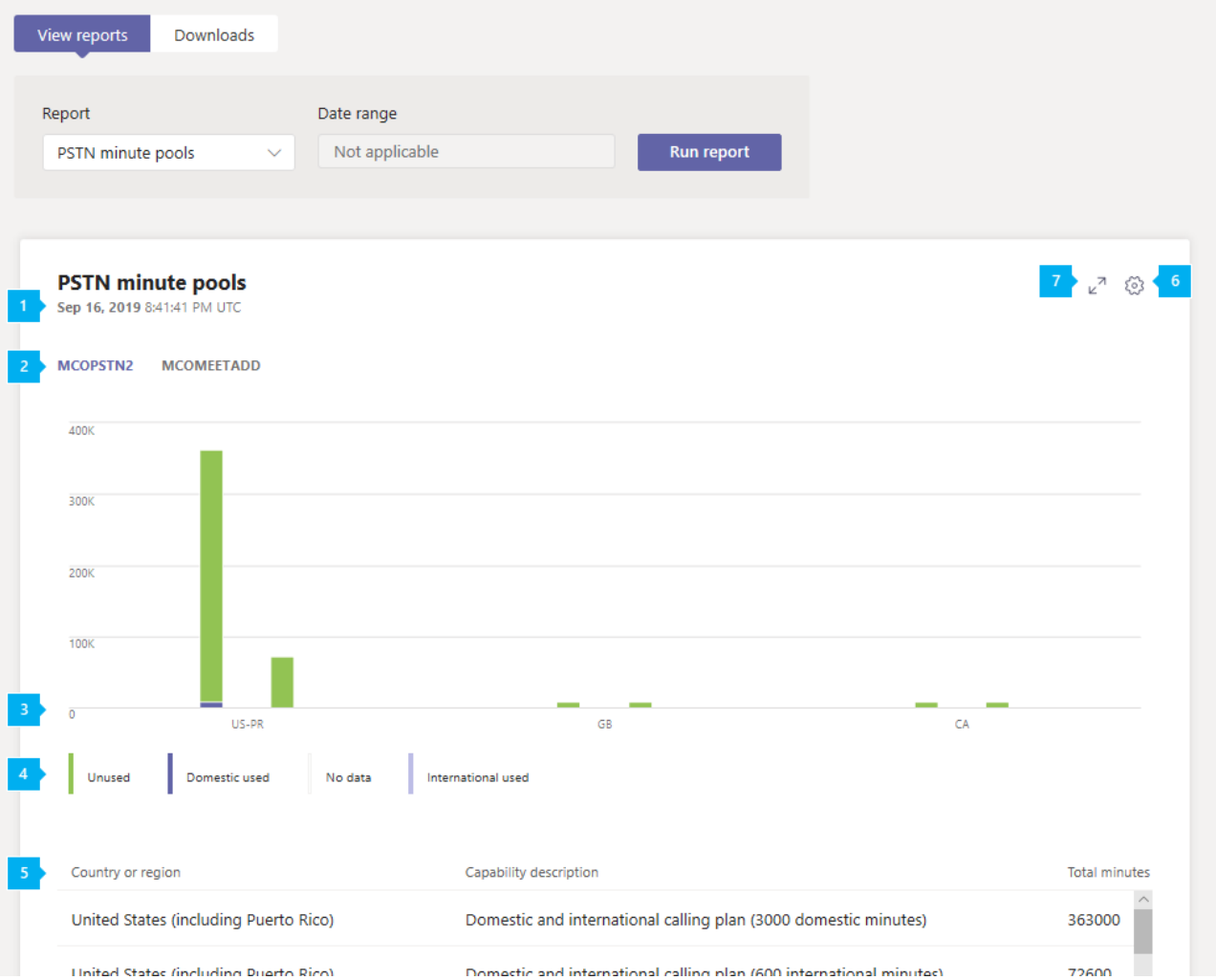
Microsoft Teams PSTN minute pools report

4/27/2020 • 2 minutes to read • Edit Online

The Teams PSTN minute pools report in the Microsoft Teams admin center gives you an overview of audio conferencing and calling activity in your organization by showing you the number of minutes consumed during the current month. You can see a breakdown of activity including the license used for calls, total minutes available, used minutes, and license usage by location.

View the PSTN minute pools report

In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **PSTN minute pools**, and then click **Run report**.



Interpret the report

CALLOUT	DESCRIPTION
1	Each report has a date for when it was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.
2	Click a capability (license) to view activity for that capability.

CALLOUT	DESCRIPTION
3	The X axis is country or region. The Y axis is number of minutes. Hover over a bar on the chart to see the activity for that usage location.
4	You can filter what you see on the chart by clicking an item in the legend. For example, click **Unused**, **Domestic users**, **No data**, or **International used** to see only the info related to each one.
5	The table gives you a breakdown of minute pools by capability and usage location. • **Country or region** is the usage location. • **Capability description** is the description of the license used for the call. The capability descriptions you may see in this report include: ◦ Domestic and international calling plan (1200 domestic minutes) ◦ Domestic and international calling plan (3000 domestic minutes) ◦ Domestic and international calling plan (600 international minutes) • **Total minutes** is the total number of minutes available for the month. • **Minutes used** is the number of minutes used each month • **Minutes available** is the number of minutes remaining for the month. • **Capability** is the license used for the call. The licenses you may see include: ◦ **MCOPSTNPP** - Communications Credits ◦ **MCOPSTN1** - Domestic Calling Plan (3000 min US / 1200 min EU plans) ◦ **MCOPSTN2** - International Calling Plan ◦ **MCOPSTN5** - Domestic Calling Plan (120 min calling plan) ◦ **MCOPSTN6** - Domestic Calling Plan (240 min calling plan) ◦ **MCOMEETADD** - Audio Conferencing ◦ **MCOMEETACPEA** - Pay Per Minute Audio Conferencing To see the information that you want in the table, make sure to add the columns to the table.
6	Select **Edit columns** to add or remove columns in the table.
7	Select **Full screen** to view the report in full screen mode.

Related topics

- Teams analytics and reporting

Microsoft Teams PSTN usage report

9/4/2020 • 14 minutes to read • Edit Online

The Teams PSTN usage report in the Microsoft Teams admin center gives you an overview of calling and audio conferencing activity in your organization. You can view detailed calling activity for Calling Plans if you use Microsoft as your telephony carrier and for Direct Routing if you use your own telephony carrier.

The **Calling Plans** tab shows information including the number of minutes that users spent in inbound and outbound PSTN calls and the cost of these calls. The **Direct Routing** tab shows you information including the SIP address and call start and end times. Use the information in this report to gain insight into PSTN usage in your organization and help you to investigate, plan, and make business decisions.

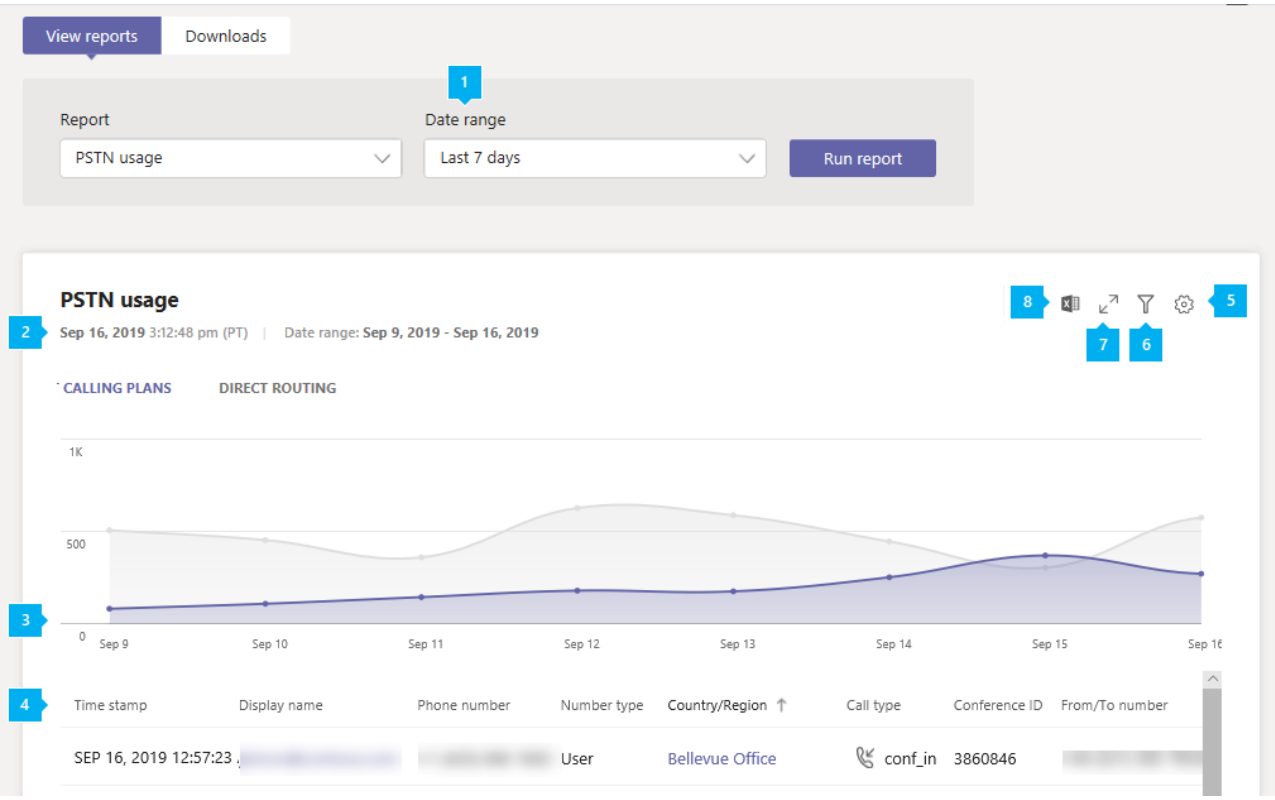
> **NOTE**
> If you have a Telstra or Softbank calling plan, you will not see any call detail records in the PSTN usage report. Please contact Telstra or Softbank for your reporting needs.

View the PSTN usage report

1. In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **PSTN usage report**.
2. Under **Date range**, select a predefined range of 7 or 28 days, or set a custom range, and then select **Run report**.

Interpret the report

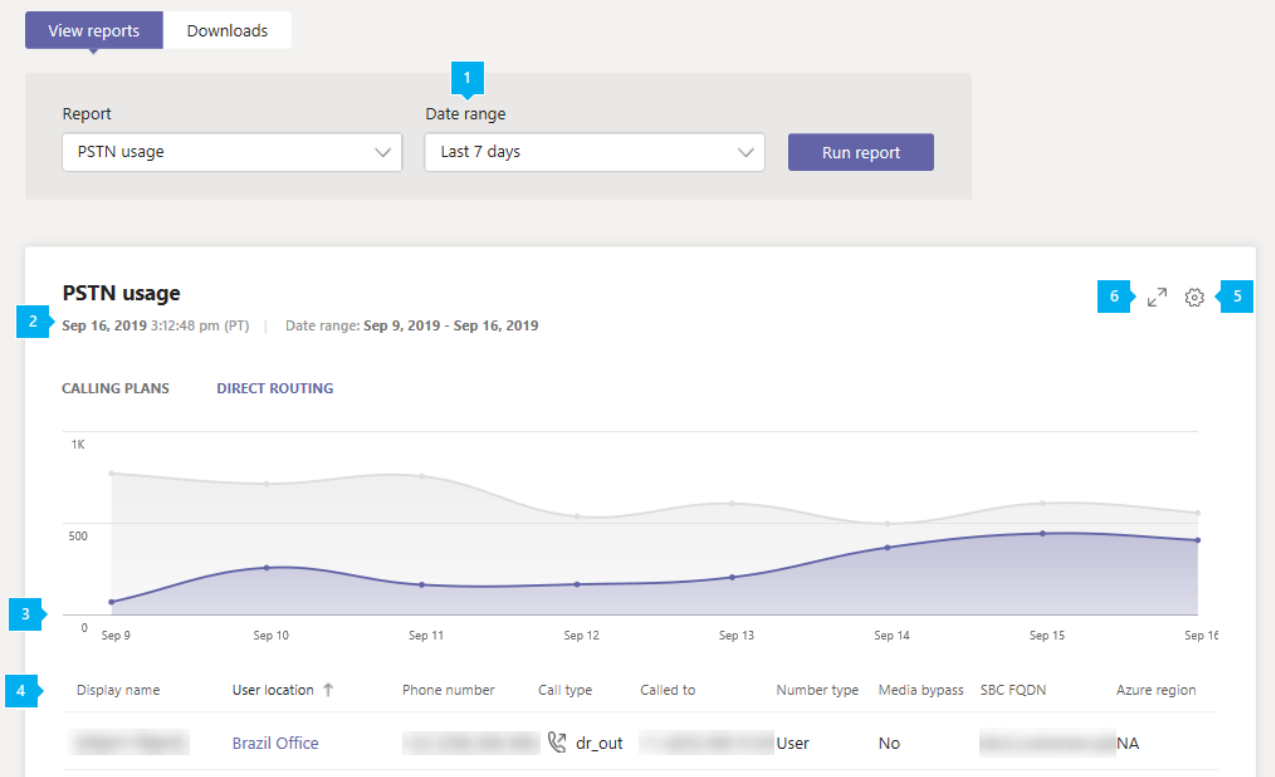
Calling Plans



CALLOUT	DESCRIPTION
1	The report can be viewed for trends over the last 7 days, 28 days, or a custom date range that you set
2	Each report has a date for when it was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.
3	The X axis is the selected date range for the specific report. The Y axis is the total number of calls over the selected time period. Hover over the dot on a given date to see the total calls on that date.
4	The table gives you a breakdown of PSTN usage per call. • **Time stamp (UTC)** is the time the call started. • **Display name** is the display name of the user. You can click the display name to go to the user's setting page in the Microsoft Teams admin center. • **Username** is the user's sign in name. • **Phone number** is the number that received the call for inbound calls or the number dialed for outbound calls. • **Call type** is whether the call was a PSTN outbound or inbound call and the type of call such as a call placed by a user or an audio conference. The calls types you may see include: Teams user call types ◦ **user_in** - the user received an inbound PSTN call. ◦ **user_out** - the user placed an outbound PSTN call ◦ **user_out_conf** - the user added two or more PSTN participants to the call such as a three-way conference call ◦ **user_out_transfer** - the user transferred the call to a PSTN number ◦ **user_out_forwarding** - the user forwarded the call to a PSTN number ◦ **conf_in** - an inbound call to the Audio Conferencing bridge ◦ **conf_out** - an outbound call from the Audio Conferencing bridge usually to add a PSTN number to the conference Teams bots call types ◦ **ucap_in** - an inbound PSTN call to Teams bot such as auto attendant or call queue ◦ **ucap_out** - an outbound PSTN call from a Teams bot such as auto attendant or call queue • **Called to** is the number dialed. • **To country or region** is the country or region dialed. • **Called from** is the number that placed the call. • **From country or region** is the country or region from where the call was placed. • **Charge** is the amount of money or cost of the call that's charged to your account. • **Currency** is the type of currency used to calculate the cost of the call.

CALLOUT	DESCRIPTION
	• **Duration** is how long the call was connected. • **Domestic/International** tells you whether the call was domestic (within a country or region) or international (outside a country or region) based on the user's location. • **Call ID** is the call ID for a call. It's an identifier for the call you can use when calling Microsoft Support. • **Number type** is the user's phone number type, such as a service of toll-free number. • **Country or region** is the usage location. • **Conference ID** is the conference ID of the audio conference. • **Capability** is the license used for the call. The license types you may see include: ◦ **MCOPSTNPP** - Communications Credits ◦ **MCOEV or MCOEV_VIRTUALUSER** - Voice Applications such as Auto-Attendant or Call Queues ◦ **FREECALL** - In the event of a technical issue that prevents us from pricing a call, the call is provided for free and will appear with this capability ◦ **MCOPSTN1** - Domestic Calling Plan (3000 min US / 1200 min EU plans) ◦ **MCOPSTN2** - International Calling Plan ◦ **MCOPSTN5** - Domestic Calling Plan (120 min calling plan) ◦ **MCOPSTN6** - Domestic Calling Plan (240 min calling plan) ◦ **MCOMEETADD** - Audio Conferencing ◦ **MCOMEETACPEA** - Pay Per Minute Audio Conferencing To see the information that you want in the table, make sure to add the columns to the table.
5	Select **Edit columns** to add or remove columns in the table.
6	Select **Filter** to filter the report by username or call type
7	Select **Full screen** to view the report in full screen mode.
8	You can export the report to a CSV file for offline analysis. Click **Export to Excel**, and then on the **Downloads** tab, click **Download** to download the report when it's ready.

Direct Routing



CALLOUT	DESCRIPTION
1	The report can be viewed for trends over the last 7 days or 28 days.
2	Each report has a date for when it was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.
3	The X axis is the selected date range for the specific report. The Y axis is the total number of calls over the selected time period. Hover over the dot on a given date to see the total calls on that date.
4	The table gives you a breakdown of PSTN usage per call. • **Time stamp (UTC)** is the time the call started. • **Display name** is the display name of the user. You can click the display name to go to the user's settings page in the Microsoft Teams admin center. The name can also be the name of a bot, for example the Call Queue or Cloud Auto Attendant. • **SIP address** is the SIP address of the user or a bot who received or made the call. • **Caller number** is the number of the user or the bot who made the call. • **Callee number** is the number of the user or the bot who received the call. On an inbound call to a Teams user it will be the Teams user, on an outbound call from a Teams user it will be the PSTN User. • **Call type** is whether the call was a PSTN outbound or inbound call and the type of call such as a call placed by a user or an audio conference. The call types you may see include: **Teams user call types** ◦ **dr_in** - the user received an inbound PSTN call ◦ **dr_out** - the user placed an outbound PSTN

CALLOUT	DESCRIPTION
	call ◦ **dr_out_user_conf** - the user added a PSTN participant to the call ◦ **user_out_transfer** - the user transferred the call to a PSTN number ◦ **dr_out_user_forwarding** - the user forwarded the call to a PSTN number ◦ **dr_out_user_transfer** - the user transferred the call to a PSTN number ◦ **dr_emergency_out** - the user made an emergency call **Teams bots call types** ◦ **dr_in_ucap** - an inbound PSTN call to a Teams bot such as auto attendant or call queue ◦ **dr_out_ucap** - an outbound PSTN call from a Teams bot such as auto attendant or call queue • **Called to** is the number of the user who received the call. • **Start time (UTC)** is the time when the SIP proxy received the final answer (SIP Message "200 OK") from the SBC on an outbound call (Teams/Bot to a PSTN User), or after the SIP Proxy send the Invite to the next hop within the Teams backend on an inbound call (PSTN User to a Teams/Bot). • **Invite time (UTC)** is the time when the initial Invite was sent on an outbound call from a Teams user or bot call to the SBC, or received on an inbound call to a Teams or bot call by the SIP Proxy component of Direct Routing from the SBC. • **Failure time (UTC)** is the time the call failed. For failed calls only. Final SIP Code, Final Microsoft Subcode, and Final SIP Phrase provide the reasons why the call failed and can help with troubleshooting. • **End time (UTC)** is the time the call ended (for successful calls only). • **Duration** is how long the call was connected. • **Number type** is the user's phone number type, such as a service of toll-free number. • **Media bypass** indicates whether the trunk was enabled for media bypass. • **SBC FQDN** is the fully qualified domain name (FQDN) of the Session Border Controller (SBC). • **Azure region for Media** is the data center that was used as media path in a non-bypass call. • **Azure region for Signaling** is the data center that was used for signaling for both bypass and non-bypass calls. • **Event type** is the event type of the call. You'll see Success for successful calls and Attempt for failed calls. • **Final SIP code** is the code with which the call ended. • **Final Microsoft subcode** is a code that indicates specific actions that occurred. • **Final SIP phrase** is the description of the SIP code and Microsoft subcode. • **Correlation ID** is a unique identifier for the call that you can use when calling Microsoft Support. • **Shared Correlation ID** is only visible in the downloadable CSV file and does not exist in the portal. The shared correlation ID exists in at least two calls which are related. Please see detailed description below.

CALLOUT	DESCRIPTION
	To see the information that you want in the table, make sure to add the columns to the table.
5	Select **Edit columns** to add or remove columns in the table.
6	Select **Full screen** to view the report in full screen mode.
7	Select **Export to Excel** to download the data in a comma separated file (CSV) for offline analysis or to use it as input for your billing system.

Caller/Callee fields considerations

Depending on the call direction, the Caller or Callee names can contain non-E164 numbers.

These fields can come from the customer SBC(s). There are three formats that the SBC can send to Direct Routing: E.164 numbers, non-E.164 numbers, and strings.

- E.164 phone number from a user who has an E.164 number to a user who also has an E.164 number.
- Call from a non-E.164 number. A user from a third-party PBX interconnected with Direct Routing makes a call to a Teams user. In this case, the caller number might be any non-E.164 number, for example +1001.
- A spammer calls and doesn't present a number, only a name, for example "Internal Revenue Service". This string will be shown in the reports.

About Shared Correlation ID

The Shared Correlation ID only exists in the exported Excel file that you download and indicates that two or more calls are related. The following explains the different scenarios, and when Shared Correlation ID is present.

1. PSTN User 1 on a PSTN endpoint called Teams User 1 on Teams client, call type Dr_In, correlation ID 57f28917-42k5-4c0c-9433-79734873f2ac, no shared correlation ID.
2. Teams User 1 on Teams client called PSTN User 1 on a PSTN endpoint, call type Dr_Out 2c12b8ca-62eb-4c48-b68d-e451f518ff4, no shared correlation ID.
3. PSTN User 1 on a PSTN endpoint called a Teams User 2 on Teams client, call type Dr_In f45e9a25-9f94-46e7-a457-84f5940efde9, shared correlation ID f45e9a25-9f94-46e7-a457-84f5940efde9.
4. Existing call 3 with correlation ID "f45e9a25-9f94-46e7-a457-84f5940efde9". PSTN User 1 in a call with Teams User 2. Teams User 2 transferred (blind or consultative) a call to Teams or PSTN User, call type Dr_Out_User_Transfer 45a1da7c-9e97-481a-8a05-3fe19a9a77e0, shared correlation ID f45e9a25-9f94-46e7-a457-84f5940efde9.

Exporting the reports

Click **Export to Excel**, and then on the **Downloads** tab, click **Download** to download the report when it's ready. Export process can take from a few seconds to several minutes to complete, depending on the quantity of the data.

This exports data of all users and enables you to do simple sorting and filtering for further analysis. Exported files contain additional fields that are not available in the online report. These can be used for troubleshooting and automated workflows.

You will receive a zip file named "**Calls.Export.** `[identifier]` **.zip**", with the identifier being an unique ID for the export that can be used for troubleshooting.

If you have both Calling Plans and Direct Routing, the exported file may contain data for both products. PSTN usage report file will have filename "**PSTN.calls.** `[UTC date]` **.csv**" and Direct Routing "**DirectRouting.calls.** `[UTC date]` **.csv**".

In addition to PSTN and Direct Routing files, the archive contains file "**parameters.json**", with the selected export time range and capabilities.

Exported files are in Comma Separated Values (CSV) format, compliant with RFC 4180 standard. The files can be opened in Excel or any other standards-compliant editor without requiring any transformations.

The first row of the CSV contains column names. All dates are UTC and in ISO 8601 format.

Exported PSTN usage report

You can export data up to one year from the current date unless country-specific regulations prohibit retention of the data for 12 months.

#	NAME	DATA TYPE (SQL SERVER)	DESCRIPTION
0	UsageId	`uniqueidentifier`	Unique call identifier
1	Call ID	`nvarchar(64)`	Call identifier. Not guaranteed to be unique
2	Conference ID	`nvarchar(64)`	ID of the audio conference
3	User Location	`nvarchar(2)`	Country code of the user, ISO 3166-1 alpha-2
4	AAD ObjectId	`uniqueidentifier`	Calling user's ID in Azure Active Directory. This and other user info will be null/empty for bot call types (ucap_in, ucap_out)
5	UPN	`nvarchar(128)`	UserPrincipalName (sign in name) in Azure Active Directory. This is usually the same as user's SIP Address, and can be same as user's e-mail address
6	User Display Name	`nvarchar(128)`	Display name of the user
7	Caller ID	`nvarchar(128)`	Number that received the call for inbound calls or the number dialed for outbound calls. E.164 format
8	Call Type	`nvarchar(32)`	Whether the call was a PSTN outbound or inbound call and the type of call such as a call placed by a user or an audio conference
9	Number Type	`nvarchar(16)`	User's phone number type, such as a service of toll-free number
10	Domestic/International	`nvarchar(16)`	Whether the call was domestic (within a country or region) or international (outside a country or region) based on the user's location

#	NAME	DATA TYPE (SQL SERVER)	DESCRIPTION
11	Destination Dialed	`nvarchar(64)`	Country or region dialed
12	Destination Number	`nvarchar(32)`	Number dialed in E.164 format
13	Start Time	`datetimeoffset`	Call start time
14	End Time	`datetimeoffset`	Call end time
15	Duration Seconds	`int`	How long the call was connected
16	Connection Fee	`numeric(16, 2)`	Connection fee price
17	Charge	`numeric(16, 2)`	Amount of money or cost of the call that is charged to your account
18	Currency	`nvarchar(3)`	Type of currency used to calculate the cost of the call (ISO 4217)
19	Capability	`nvarchar(32)`	The license used for the call

Exported Direct Routing usage report

You can export data up to five months (150 days) from the current date unless country-specific regulations prohibit retention of the data for that period.

#	NAME	DATA TYPE (SQL SERVER)	DESCRIPTION
0	CorrelationId	`uniqueidentifier`	Unique call identifier
1	SIP Address	`nvarchar(128)`	The address of the user or bot that made or received the call. Note that this is actually UserPrincipalName (UPN, sign in name) in Azure Active Directory, which is usually the same as SIP Address
2	Display Name	`nvarchar(128)`	The name of a user or a calling bot (for example, Call Queue or Auto Attendant) as set in Microsoft 365 admin center
3	User country	`nvarchar(2)`	Country code of the user, ISO 3166-1 alpha-2

#	NAME	DATA TYPE (SQL SERVER)	DESCRIPTION
4	Invite time	`datetimeoffset`	When the initial Invite send on outbound from Teams user or bot call to the SBC, or received on inbound to Teams or bot call by the SIP Proxy component of Direct Routing from the SBC
5	Start time	`datetimeoffset`	Time when the SIP proxy received the final answer (SIP Message "200 OK") from the SBC on outbound (Teams/Bot to a PSTN User), or after the SIP Proxy send the Invite to the next hop within Teams backend on inbound call (PSTN User to a Teams/Bot). For failed and unanswered calls, this can be equal to invite or failure time
6	Failure time	`datetimeoffset`	Only exists for failed (not fully established) calls
7	End time	`datetimeoffset`	Only exists for successful (fully established) calls. Time when call ended
8	Duration (seconds)	`int`	Duration of the call
9	Success	`nvarchar(3)`	Yes/No. Success or attempt
10	Caller Number	`nvarchar(32)`	Number of the user or bot who made the call. On inbound to a Team user call it will be a PSTN User, on outbound from Teams user call it will be the Teams user number
12	Callee Number	`nvarchar(32)`	Number of the user or bot who received the call. On inbound to a Team user call it will be the Teams user, on outbound from Teams user call it will be the PSTN User
13	Call type	`nvarchar(32)`	Call type and direction
14	Azure region for Media	`nvarchar(8)`	The datacenter used for media path in non-bypass call

#	NAME	DATA TYPE (SQL SERVER)	DESCRIPTION
15	Azure region for Signaling	`nvarchar(8)`	The datacenter used for signaling for both bypass and non-bypass calls
16	Final SIP code	`int`	The code with which the call ended, RFC 3261
17	Final Microsoft subcode	`int`	In addition to the SIP codes, Microsoft has own subcodes that indicate the specific issue
18	Final SIP Phrase	`nvarchar(256)`	Description of the SIP code and Microsoft subcode
19	SBC FQDN	`nvarchar(64)`	Fully qualified domain name of the session border controller
20	Media bypass	`nvarchar(3)`	Yes/No. Indicates if the trunk was enabled for media bypass or not
21	Shared correlation ID	`uniqueidentifier`	Indicates that two or more calls are related

Related topics

- Teams analytics and reporting

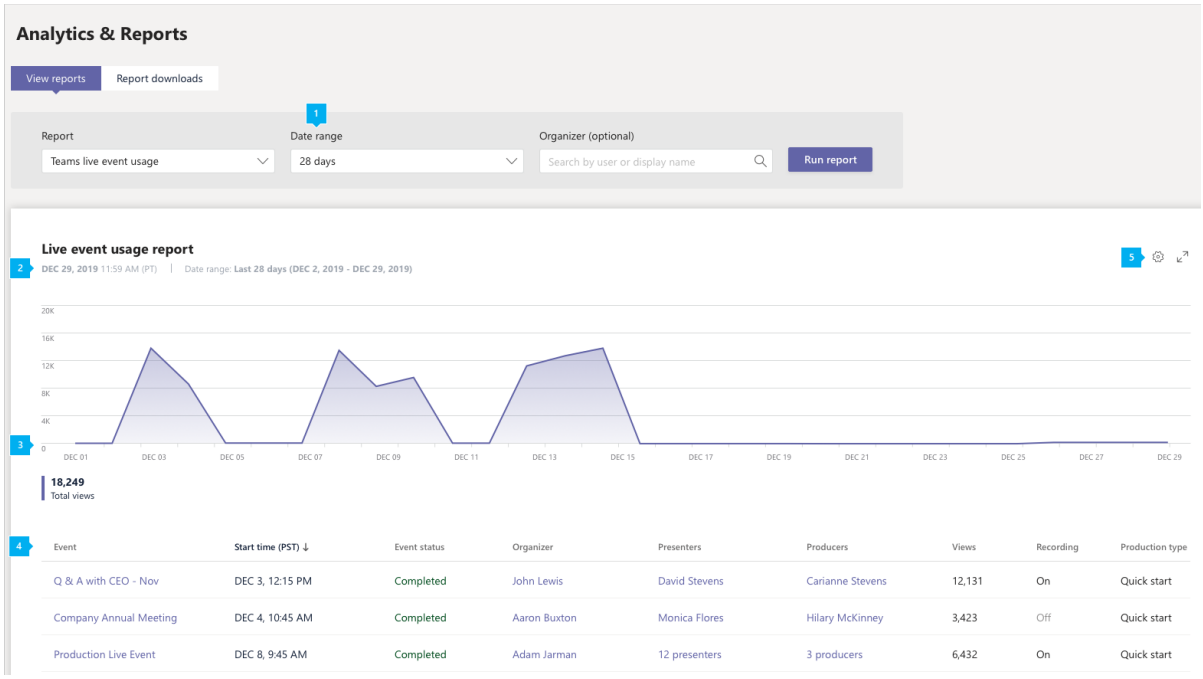
Microsoft Teams live event usage report

8/18/2020 • 2 minutes to read • Edit Online

The Teams live event usage report in the Microsoft Teams admin center shows you the activity overview for live events held in your organization. You can view usage information, including event status, start time, views, and production type for each event. You can gain insight into usage trends and see who in your organization schedules, presents, and produces live events.

View the live event usage report

1. In the left navigation of the Microsoft Teams admin center, click **Analytics & reports** > **Usage reports**. On the **View reports** tab, under **Report**, select **Teams live event usage**.
2. Under **Date range**, select a predefined range or set a custom range. You can set a range to show data up to a year, six months before and after the current date.
3. (Optional) Under **Organizer**, you can choose to show only live events organized by a specific user.
4. Click **Run report**.



Interpret the report

CALLOUT	DESCRIPTION
1	The Teams live event report can be viewed for trends over the last 7 days, 28 days, or a custom date range that you set.
2	Each report has a date for when it was generated. The report reflects near real time activity when the page is refreshed.

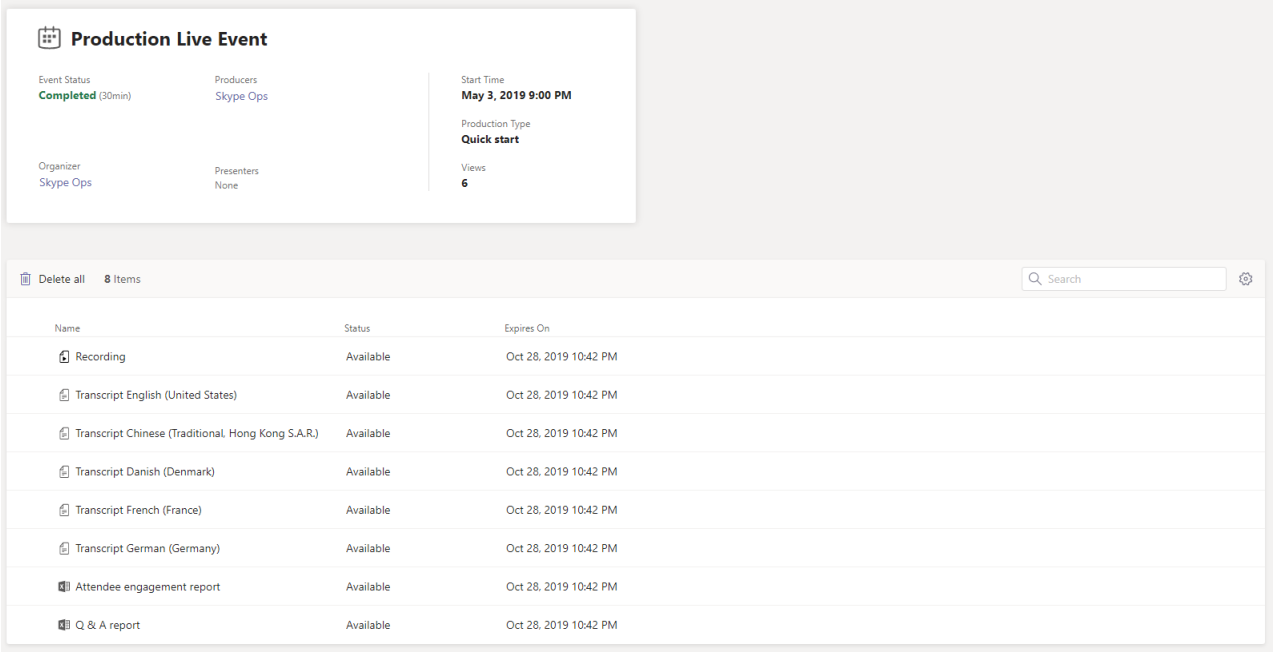
CALLOUT	DESCRIPTION
3	• The X axis on the chart is the selected date range for the report. • The Y axis is the total view count. Hover over the dot on a given date to see the number of views across all live events on that date.
4	The table gives you a breakdown of each live event. • **Event** is the display name of the live event. Click the the event name to get more details about the event. • **Start Time** refers to the start date and time of the event. • **Event Status** shows whether the event has taken place. • **Organizer** is the name of the event organizer. • **Presenters** are the names of the event presenters. • **Producers** are the names of the event producers. • **Views** is the number of unique views after the event is completed . • **Recording** shows whether the recording setting is on or off. • **Production Type** shows whether the event is produced in Teams or by an external application or device. Note that if a user account no longer exists in Azure AD, the user name is displayed as "--" in the table. To see the information that you want in the table, make sure to add the columns to the table.
5	Select **Edit columns** to add or remove columns in the table.

Notes

Showing up to 100 live events that match the current report criteria. To see more live events, apply date filters to reduce the list size.

View event details

The live event details page gives you a summary of the details of a live event and lists all the files, including transcripts and recordings, associated with the event. Click a file name to view or download the file.



If your organization is enabled for Hive eCDN or Kollective eCDN, you can get additional attendee analytics by clicking the partner report link.

Related topics

- Teams analytics and reporting
- What are Teams live events?

Use activity reports for Microsoft Teams

5/26/2020 • 8 minutes to read • Edit Online

You can use activity reports in the Microsoft 365 admin center to see how users in your organization are using Microsoft Teams. For example, if some don't use Microsoft Teams yet, they might not know how to get started or understand how they can use Teams to be more productive and collaborative. Your organization can use the activity reports to decide where to prioritize training and communication efforts.

How to view the Teams reports in the Reports dashboard

1. In the Microsoft 365 admin center, select **Reports** > **Usage**.
2. On the **Usage** page, choose **Select a report**, and then under **Microsoft Teams** in the list of reports, choose the report you want to view.

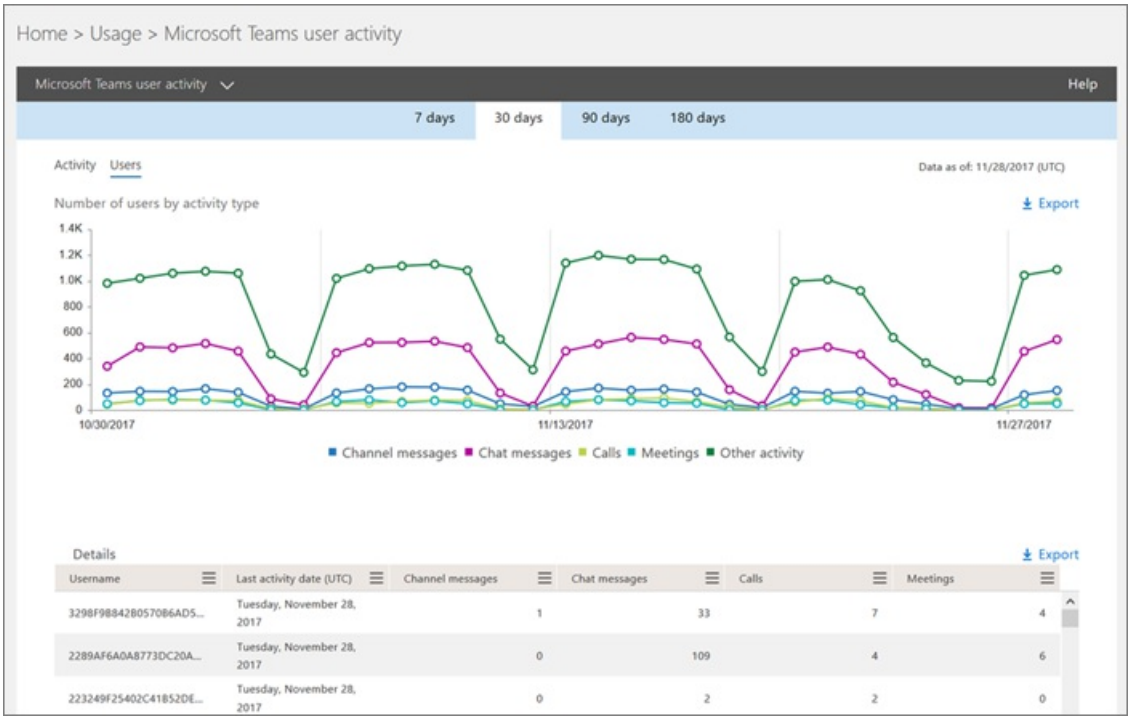
Teams activity reports that are available

There are currently two activity reports you can view:

- Microsoft Teams user activity report
- Microsoft Teams device usage report

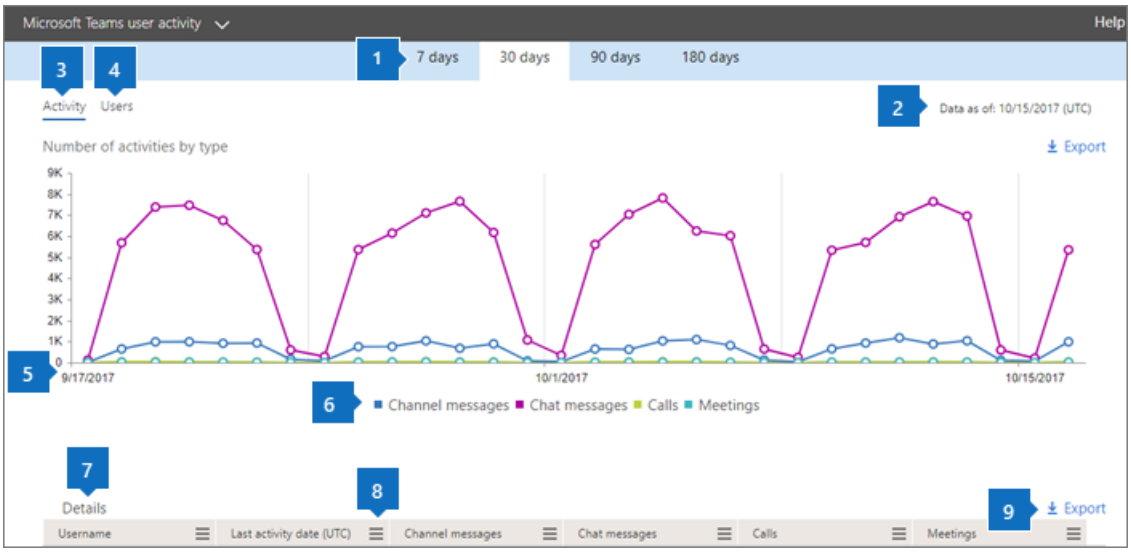
Microsoft Teams user activity report

The Teams user activity report gives you a view of the most common activities that your users perform in Teams. This includes how many people engage in a chat in a channel, how many communicate via private chat message, and how many participate in calls or meetings. You can see this information for your whole organization, as well as for each individual user.



Interpret the Microsoft Teams user activity report

You can get a view into Teams user activity by looking at the **Activity** and **Users** charts.

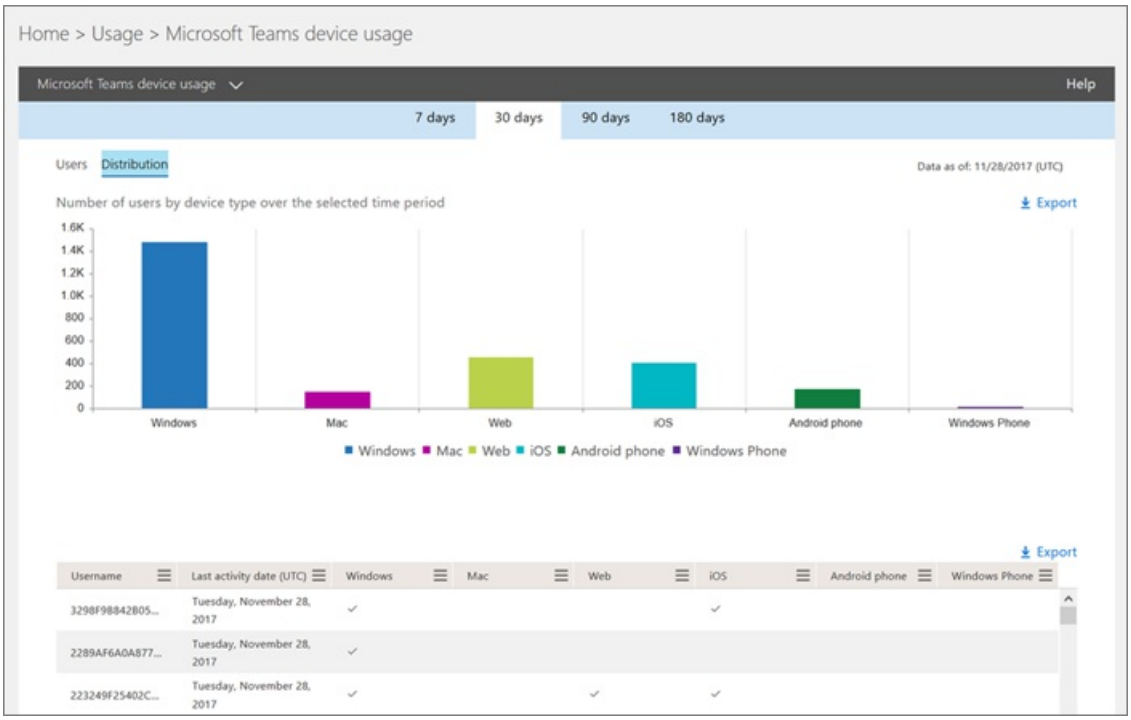


CALLOUT	DESCRIPTION
1	The Teams user activity report can be viewed for trends over the last 7 days, 30 days, 90 days, or 180 days. However, if you click into a particular time range in the report, the table (7) will show data for 30 days, up to the date (2) for when the report was generated.
2	Each report has a date for when this report was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.
3	The **Activity** view shows you the number of Microsoft Teams activities by activity type. The activity types are number of team chat messages, private chat messages, calls, and meetings.
4	The **Users** view shows you the number of users by activity type. The activity types are number of team chat messages, private chat messages, calls, and meetings.
5	The X axis on the charts is the selected date range for the specific report. • On the **Activity** chart, the Y axis is the count of the specified activity. • On the **Users** chart, the Y axis is the number of users participating in teams chats, private chats, calls, or meetings.
6	You can filter the series you see on the chart by clicking on an item in the legend. For example, on the **Activity** chart, click or tap **Channel messages**, **Chat messages**, **Calls**, or **Meetings** to see only the info related to each one. Changing this selection doesn't change the information in the grid table.

CALLOUT	DESCRIPTION
7	The list of active teams across the widest (180-day) reporting time frame. The activity count will vary according to the date selection. To see the following information the table, make sure you add the columns to the table. • **Username** is the email address of the user. You can display the actual email address or make this field anonymous. • **Last Activity Date (UTC)** refers to the last date that the user participated in a Microsoft Teams activity. • **Channel messages** is the number of unique messages that the user posted in a team chat during the specified time period. • **Chat messages** is the number of unique messages that the user posted in a private chat during the specified time period. • **Calls** is the number of calls that the user participated in during the specified time period. • **Meetings** is the number of online meetings that the user participated in during the specified time period. • **Other activity** is the number of other team activities by the user some of which include, and not limited to: liking messages, apps, working on files, searching, following teams and channel and favoriting them. • **Deleted** indicates if the team is deleted. If the team is deleted, but had activity in the reporting period, it will show up in the grid with deleted set to true. • **Deleted date** is the date that the user was deleted. • **Product assigned** is the list of products that are assigned to the user. If your organization's policies prevents you from viewing reports where user information is identifiable, you can change the privacy setting for all these reports. Check out the **How do I hide user level details?** section in the Activity Reports in the Microsoft 365 Admin Center Preview.
8	Click or tap **Columns** to add or remove columns in the table.
9	Click or tap **Export** to export report data to an Excel .csv file. This exports data of all users and enables you to do simple sorting and filtering for further analysis. If you have less than 2,000 users, you can sort and filter within the table in the report itself. If you have more than 2,000 users, you will have to export the data to filter and sort the report.

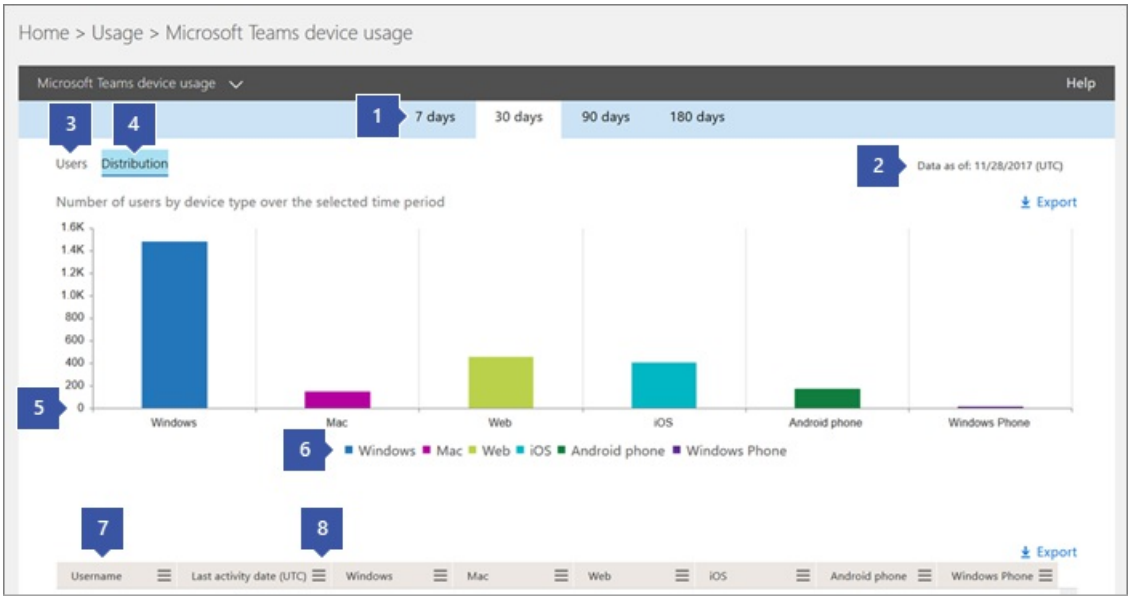
Microsoft Teams device usage report

The Teams device usage report provides you with information about how your users connect to Teams, including mobile apps. The report helps you understand which devices are popular in your organization and how many users work on the go.



Interpret the Microsoft Teams device usage report

You can get a view into Teams device usage by looking at the **Users** and **Distribution** charts.



CALLOUT	DESCRIPTION
1	The Teams device report can be viewed for trends over the last 7 days, 30 days, 90 days, or 180 days. However, if you click into a particular time range in the report, the table (7) will show data for 30 days, up to the date (2) for when the report was generated.
2	Each report has a date for when this report was generated. The reports usually reflect a 24 to 48 hour latency from time of activity.
3	The **Users** view shows you the number of daily users by device type.

CALLOUT	DESCRIPTION
4	The **Distribution** view shows you the number of users by device over the selected time period.
5	• On the **Users** chart, the X axis is the selected date range for the report and the Y axis is the number of users by device type. • On the **Distribution** chart, the X axis shows the different devices used to connect to Teams and the Y axis is the number of users using the device.
6	You can filter the series you see on the chart by clicking on an item in the legend. For example, on the **Distribution** chart, click or tap **Windows**, **Mac**, **Linux**, **Web**, **iOS**, or **Android** to see only the info related to each one. Changing this selection doesn't change the information in the grid table.
7	The list of active teams across the widest (180-day) reporting time frame. The activity count will vary according to the date selection. To see the following information in the table, make sure you add the columns to the table. • **Username** is the email address of the user. You can display the actual email address or make this field anonymous. • **Last Activity Date (UTC)** refers to the last date that the user participated in a Teams activity. • **Deleted** indicates if the team is deleted. If the team is deleted, but had activity in the reporting period, it will show up in the grid with deleted set to true. • **Deleted date** is the date that the user was deleted. • **Windows** is selected if the user was active in the Teams desktop client on a Windows-based computer. • **Mac** is selected if the user was active in the Teams desktop client on a macOS computer. • **Linux** is selected if the user was active in the Teams desktop client on a Linux computer. • **Web** is selected if the user was active on the Teams web client. • **iOS** is selected if the user was active on the Teams mobile client for iOS. • **Android phone** is selected if the user was active on the Teams mobile client for Android. If your organization's policies prevents you from viewing reports where user information is identifiable, you can change the privacy setting for all these reports. Check out the **How do I hide user level details?** section in the Activity Reports in the Microsoft 365 Admin Center Preview.
8	Click or tap **Columns** to add or remove columns in the table.

CALLOUT	DESCRIPTION
9	Click or tap **Export** to export report data to an Excel .csv file. This exports data of all users and enables you to do simple sorting and filtering for further analysis. If you have less than 2,000 users, you can sort and filter within the table in the report itself. If you have more than 2,000 users, you will have to export the data to filter and sort the report.

Who can access the Teams activity reports

The activity reports can be accessed by users that are assigned:

- Global admin role
- Product-specific admin role (Exchange, Skype for Business, or SharePoint)
- Reports reader role

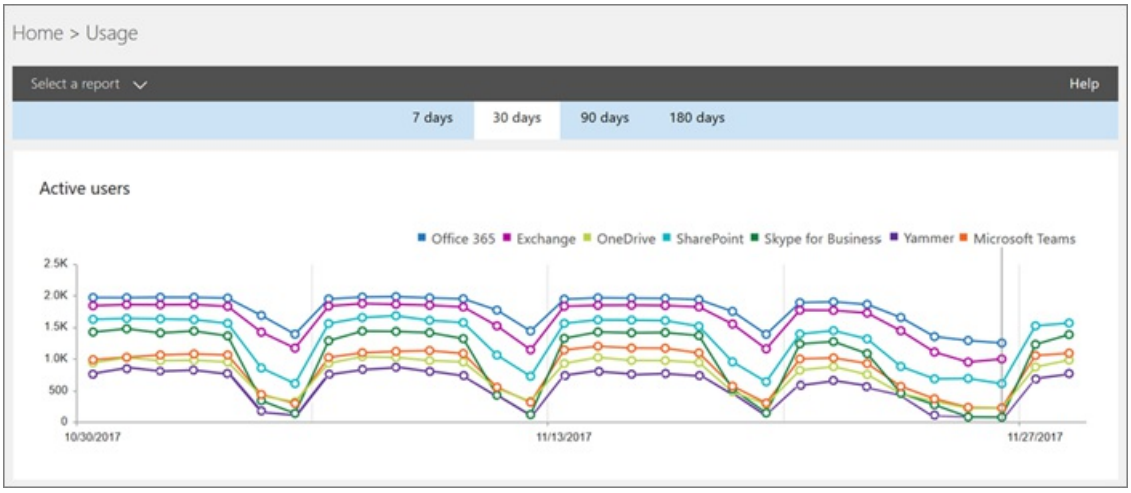
Reports reader role

You can assign the *Reports reader* role to non-IT staff who you want to have access to these reports. By assigning this role to training managers or business stakeholders, you can make sure that they have access to the insights that are helpful to drive and track adoption of Teams. To learn how to assign roles, read Assign administrator and on-administrator roles to users with Azure Active Directory.

Other information on the Reports dashboard

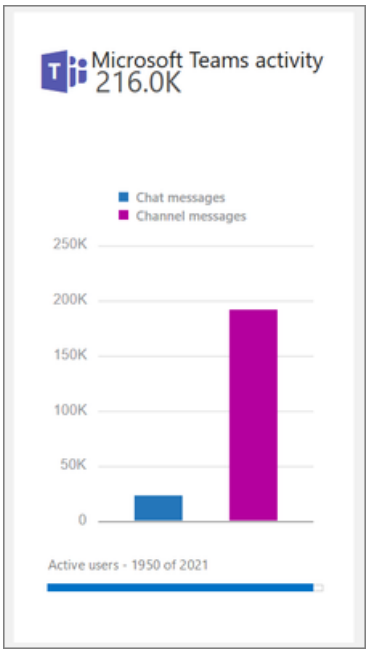
At-a-glance activity widget

The Reports dashboard includes the usage data from Teams in the at-a-glance activity widget, which gives you a cross-product view of how users communicate and collaborate using the other various services in Microsoft 365 or Office 365.



Teams activity card

The Teams activity card on the Reports dashboard gives you an overview of the activity in Teams, including the number of active users, so that you can quickly understand how many users are using the service. Clicking the activity card on the dashboard takes you to the Teams user activity report.


Microsoft Teams activity
216.0K
Chat messages
Channel messages
250K
200K
150K
100K
50K
0
Active users - 1950 of 2021

Apps, bots, & connectors in Microsoft Teams

9/21/2020 • 5 minutes to read • Edit Online

Apps let you find content from your favorite services and share it right in Teams. They help you do things such as pin services at the top of a channel, chat with bots, or share and assign tasks. To learn more, read Overview of apps in Teams.

We recommend that you include our featured apps - such as Planner - in your initial Teams rollout. Add other apps, bots, & connectors as you drive Teams adoption.

You also have the option of creating your own custom apps. See our developer documentation for more information.

Apps deployment decisions

Teams provides a great out-of-the-box collaboration experience for your organization, and most organizations find that the default settings work for them. This article helps you decide whether to change any of the default settings, based on your organization's profile and business requirements, then it walks you through each change. We've split the settings into two groups, starting with the core set of changes you're more likely to make. The second group includes the additional settings you may want to configure, based on your organization's needs.

Core deployment decisions

These are the apps settings that most organizations want to change (if the Teams default settings don't work for them).

App availability settings

Teams provides a number of apps published by Microsoft and by third parties to engage users, support productivity, and integrate commonly used business services into Teams. Get apps from the Teams Store. By default, all apps, including custom apps that you've submitted via the Teams Store approval process, are turned on for all users. For example, users can use the Planner app to build and manage team tasks in Teams.

By default, all Microsoft-provided, third-party, and custom apps are available, and you can turn individual apps on or off. There are org-wide settings that lets you turn all third-party and/or custom apps on or off for your entire organization.

ASK YOURSELF	ACTION
Will you change the default Teams apps settings?	For more information about policies and settings that you can use to manage apps in your organization, see Admin settings for apps in Microsoft Teams.

App permissions and other considerations

Apps are consented to by users and managed by the admin or IT pro through policies. However, for the most part, an app's permissions and risk profile are defined in the app itself.

ASK YOURSELF	ACTION
Which apps do I want to allow access to? Which ones do I not want to allow access to?	• See Microsoft Teams apps permissions and considerations for a list of things you should consider when allowing access to an app, bot, tab, or connector. • See Manage your apps in the Microsoft Teams admin center for information about making an app available to users in your organization.

Bots for private chats and channels

Bots are automated programs that respond to queries or give updates and notifications about details users find interesting or want to stay informed about. Bots allow users to interact with cloud services such as task management, scheduling, and polling in a Teams chat. Teams supports bots in private chats and channels. Administrators can control whether the use of bots is allowed in a Microsoft 365 or Office 365 organization.

ASK YOURSELF	ACTION
Do I want to allow custom bots in my organization?	For more information about adding bots, see Add bots for private chats and channels in Microsoft Teams. For information about turning custom bots on or off, see Admin settings for apps in Microsoft Teams.

Built-in and custom tabs

Owners and team members can add tabs to a channel, private chat, and group chat to help integrate their cloud services. Add tabs to help users access and manage the data they need or use the most. In channels, the Conversations and Files tabs are created by default. In every private chat, the Conversations, Files, Organization, and Activity tabs are created by default. In addition to these built-in tabs, you can design and add custom tabs. To learn about turning Teams apps on or off for your organization, read Admin settings for apps in Teams.

ASK YOURSELF	ACTION
Do I want to allow custom tabs in my organization?	For more information, see Use built-in and custom tabs in Teams.

Custom connectors

Connectors keep your team current by delivering content and updates from services you frequently use directly into a channel. With connectors, your Teams users can receive updates from popular services such as Twitter, Trello, Wunderlist, GitHub, and Azure DevOps Services in their Teams chats.

ASK YOURSELF	ACTION
Do I want to allow users to create custom connectors?	For more information, see Use custom connectors in Teams.

Additional deployment decisions

You may want to change these settings, based on your organization's needs and configuration.

Activity reports

You can use activity reports to see how users in your organization are using Teams. For example, if some don't use Teams yet, they might not know how to get started or understand how they can use Teams to be more productive and collaborative. Your organization can use the activity reports to decide where to prioritize training and communication efforts. To view activity reports, you must be a global admin in Microsoft 365 or Office 365, Teams service admin, or Skype for Business admin.

ASK YOURSELF	ACTION
Who needs to see the activity reports, and do they have the correct permissions to view them?	• If you don't want to assign an admin role to a user, you can assign the Reports reader role. • See Roles and permissions and View and assign roles for information about assigning admin roles in Azure Active Directory.

App templates

App templates are production-ready apps for Microsoft Teams that are community driven, open-source, and available on GitHub. Each contains detailed instructions for deploying and installing that app for your organization, providing a ready-to-use app that you can install and begin using immediately. The complete source code is available as well, so you can explore it in detail, or fork the code and alter it to meet your specific needs.

ASK YOURSELF	ACTION
Do I want to install any Teams app templates, such as Icebreaker?	To learn more, read App templates for Teams.

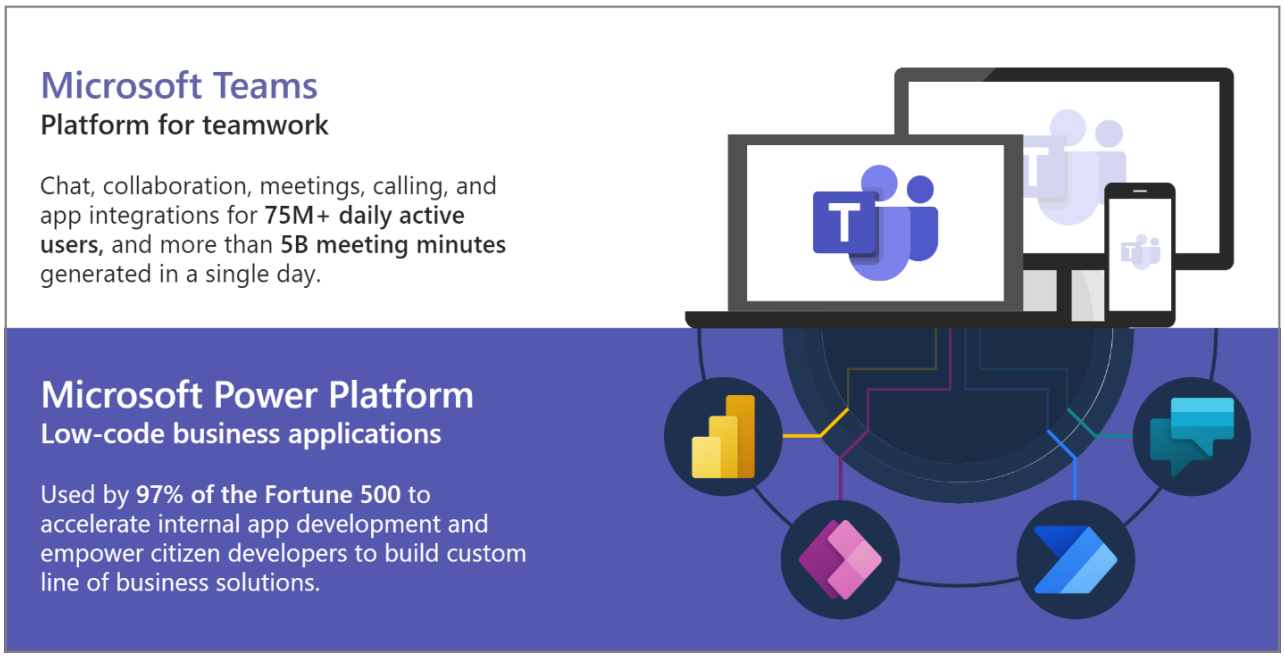
Next steps

- Drive adoption of featured apps, such as Planner.
- Roll out meetings & conferencing
- Roll out cloud voice

Teams integration with Microsoft Power Platform

12/5/2020 • 2 minutes to read • Edit Online

Microsoft Power Platform helps users accelerate their development with low-code tools to analyze data using **Power BI**, build custom apps using **Power Apps**, automate processes using **Power Automate**, and create intelligent bots using **Power Virtual Agents** more quickly than ever. With the shift to remote and hybrid work, Microsoft Teams has enabled people around the world to continue to create, collaborate, and communicate. With more than 75 million daily active users, Teams is how people are getting work done.



Microsoft Power Platform provides many integration capabilities with Teams where you can embed **Power BI** reports in the Teams workspace, embed apps created using **Power Apps** as a tab or personal app, trigger a **Power Automate** flow from any message or use adaptive cards, and add your bot created using **Power Virtual Agents** to Teams for other members of your organization to interact with.

Starting September 2020, integration with Microsoft Power Platform has improved to let users do the following *without ever leaving the Teams interface*:

- Create and share dashboards, reports, and apps using **Power BI** to make data-driven decisions.
- Create and share low-code, purpose-built apps using an integrated **Power Apps** studio by connecting to your business data stored either in the new underlying data platform (Microsoft Dataverse for Teams), Microsoft 365, or in other data sources through connectors.
- Create automated workflows between your apps and services to synchronize files, get notifications, collect data, and more using **Power Automate**.
- Build bots using a guided, no-code graphical interface using **Power Virtual Agents** to easily create digital assistants within Teams and make them available to your colleagues to chat with.

The new capabilities to create apps, bots, and workflows are backed by the new built-in, low-code data platform for Teams, Dataverse for Teams, which provides relational data storage, rich data types, enterprise grade governance, and one-click solution deployment. Dataverse for Teams is built on top of Microsoft Dataverse. With Dataverse for Teams, Teams users can find and install custom, ready-to-use solutions from the Teams app store that showcase common scenarios across industries. You can customize and extend these custom solutions to adapt to your organization's branding and requirements.

Licensing

The new capabilities are available to the select Microsoft 365 subscriptions.

- For more information about licensing requirements for Power Apps, Power Automate, Power Virtual Agents, and Dataverse for Teams, see Licensing.
- For more information about licensing requirements for Power BI, see Requirements.

How do I get started?

- Power BI and Teams
- Power Apps and Teams
- Power Automate and Teams
- Power Virtual Agents and Teams

Manage your apps in the Microsoft Teams admin center

10/15/2020 • 9 minutes to read • Edit Online

As an admin, the Manage apps page in the Microsoft Teams admin center is where you view and manage all Teams apps for your organization. Here, you can see the org-level status and properties of apps, approve or upload new custom apps to your organization's app store, block or allow apps at the org level, add apps to teams, purchase services for third-party apps, view permissions requested by apps, grant admin consent to apps, and manage org-wide app settings.

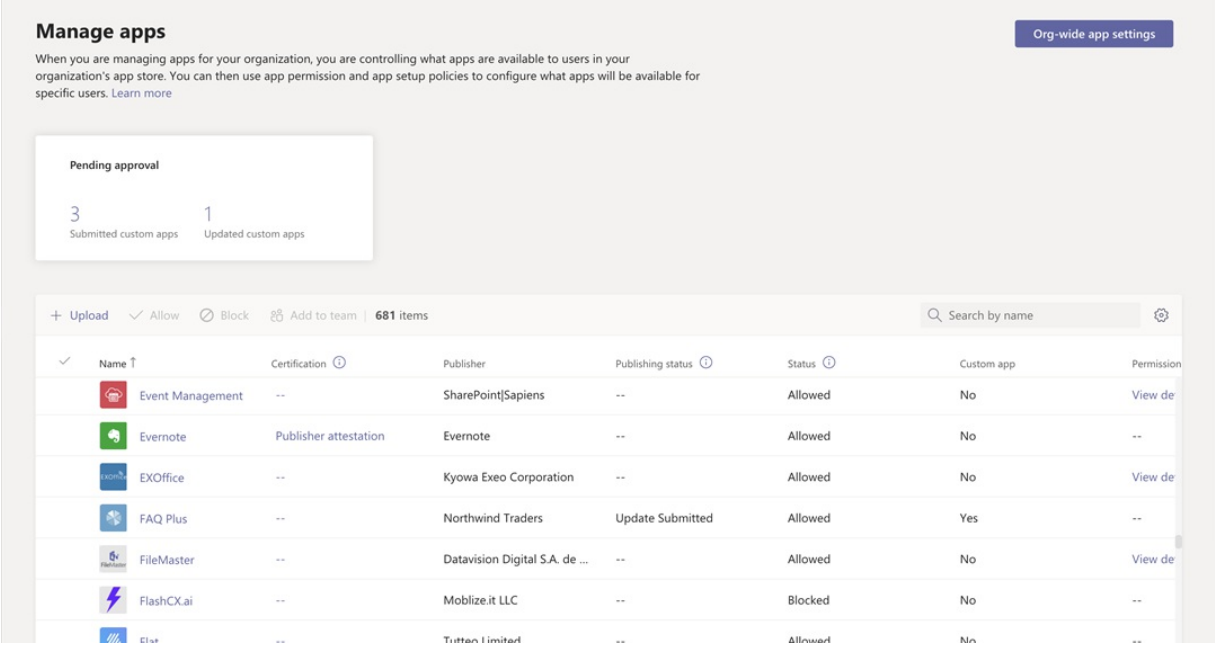
The Manage apps page gives you a view into all available apps, providing you with the information you need to decide which apps to allow or block across your organization. You can then use app permission policies, app setup policies, and custom app policies and settings to configure the app experience for specific users in your organization.

In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**. You must be a global admin or Teams service admin to access the page.

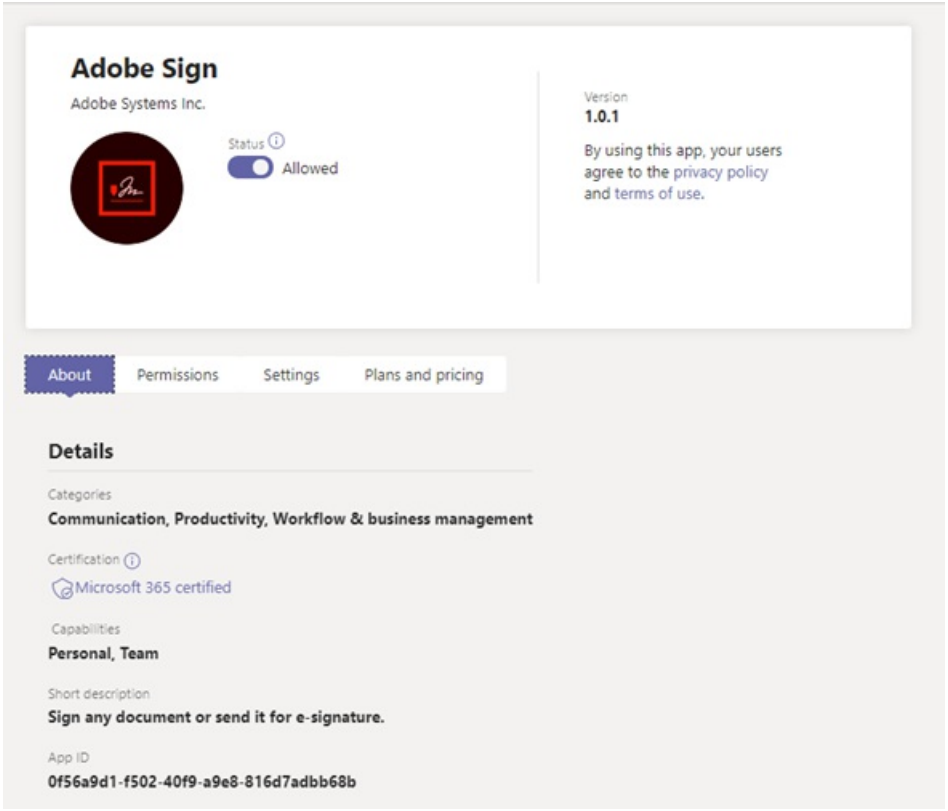
> **NOTE**
>
> The Manage apps page isn't available yet in Microsoft 365 Government Community Cloud (GCC) deployments of Teams.

View apps

You can view every app including the following information about each app.



- **Name**: The app name. Click the app name to go to the app details page to see more information about the app. This includes a description of the app, whether it's allowed or blocked, version, privacy policy, terms of use, categories that apply to the app, certification status, supported capabilities, and app ID. Here's an example:



- **Certification**: If the app has gone through certification, you'll see either **Microsoft 365 certified** or **Publisher attestation**. Click the link to view certification details for the app. If you see "--", we don't have certification information for the app. To learn more about certified apps in Teams, read Microsoft 365 App Certification program.
- **Publisher**: Name of the publisher.
- **Publishing status**: Publishing status of custom apps.
- **Status**: Status of the app at the org level, which can be one of the following:
  - **Allowed**: The app is available for all users in your organization.
  - **Blocked**: The app is blocked and not available for any users in your organization.
  - **Blocked org-wide**: The app is blocked in org-wide app settings.

    It's important to know that this column represents the allowed and blocked status of apps that were formerly on the **Org-wide settings** pane. You now view, block, and allow apps at the org-wide on the **Manage apps** page.
- **Licenses**: Indicates whether an app offers a Software as a Service (SaaS) subscription for purchase. This column applies only to third-party apps. Each third-party app will have one of the following values:
  - **Purchase now**: The app offers a SaaS subscription and is available to purchase.
  - **Purchased**: The app offers a SaaS subscription and you've purchased licenses for it.
  - **- -**: The app doesn't offer a SaaS subscription.
- **Custom app**: Whether the app is a custom app.
- **Permissions**: Indicates whether a third-party or custom app that's registered in Azure Active Directory (Azure AD) has permissions that need consent. You'll see one of the following values:
  - **View details**: The app has permissions that require consent before the app can access data.
  - **- -**: The app doesn't have permissions that need consent.

- **Categories**: Categories that apply to the app.
- **Version**: App version.

To see the information that you want in the table, click **Edit Column** in the upper-right corner to add or remove columns to the table.

Publish a custom app to your organization's app store

Use the Manage apps page to publish apps that are built specifically for your organization. After you publish a custom app, it's available to users in your organization's app store. There are two ways to publish a custom app to your organization's app store. The way that you use depends on how you get the app.

- Approve a custom app: Use this method if the developer submits the app directly to the Manage apps page using the Teams App Submission API. You can then review and publish (or reject) the app directly from the app details page.
- Upload an app package: Use this method if the developer sends you the app package in .zip format. You publish the app by uploading the app package.

Approve a custom app

The **Pending approvals** widget on the Manage apps page notifies you when a developer submits an app by using the Teams App Submission API. A newly submitted app is listed with a **Publishing status** of **Submitted** and an **Status** of **Blocked**. Go to the app details page to see more information about the app, and then to publish it, set **Publishing status** to **Publish**.

You're also notified when a developer submits an update to a custom app. You can then review and publish (or reject) the update on the app details page. All app permission policies and app setup policies remain enforced for the updated app.

To learn more, see Publish a custom app submitted through the Teams App Submission API.

Upload an app package

The developer creates a Teams app package using Teams App Studio, and then sends it to you in .zip format. When you have the app package, you can upload it to your organization's app store.

To upload a new custom app, select **Upload** to upload the app package. The app isn't highlighted after it's uploaded so you'll need to search the list of apps on the Manage apps page to find it.

To update an app after it's uploaded, in the list of apps on the Manage apps page, click the app name, and then click **Update**. Doing this replaces the existing app and all app permission policies and app setup policies remain enforced for the updated app.

To learn more, see Publish a custom app by uploading an app package.

Allow and block apps

The Manage apps page is where you allow or block individual apps at the org level. It shows every available app and its current org-level app status. (Blocking and allowing apps at the org level has moved from the **Org-wide app settings** pane to here.)

To allow or block an app, select it, and then click **Allow** or **Block**. When you block an app, all interactions with that app are disabled and the app doesn't appear in Teams for any users in your organization.

When you block or allow an app on the Manage apps page, that app is blocked or allowed for all users in your organization. When you block or allow an app in a Teams app permission policy, it's blocked or allowed for users who are assigned that policy. For a user to be able to install and interact with any app, you must allow the app at the org level on the Manage apps page and in the app permission policy that's assigned to the user.

> **NOTE**
>
> To uninstall an app, right-click the app, and then click **Uninstall** or use the **More apps** menu on the left side.

Add an app to a team

You use the **Add to team** button to install an app to a team. Keep in mind that this is only for apps that can be installed in a team scope. The **Add to team** button isn't available for apps that can only be installed in the personal scope.



1. Search for the app you want, and then select the app by clicking to the left of the app name.
2. Select **Add to team**.
3. In the **Add to team** pane, search for the team you want to add the app to, select the team, and then select **Apply**.

Purchase services for third-party apps

You can search for and purchase licenses for services offered by third-party apps for users in your organization directly from the Manage apps page. The **Licenses** column in the table indicates whether an app offers a paid SaaS subscription. Click **Purchase now** to view plans and pricing information and buy licenses for your users. To learn more, see Purchase services for Teams third-party apps in the Microsoft Teams admin center.

Grant admin consent to apps

You can review and grant consent to apps that request permissions on behalf of all users in your organization. You do this so that users don't have to review and accept the permissions requested by the app when they start the app. The **Permissions** column indicates whether an app has permissions that need consent. You'll see a **View details** link for each app registered in Azure AD that has permissions that need consent. To learn more, see View app permissions and grant admin consent in the Microsoft Teams admin center.

View resource-specific consent permissions

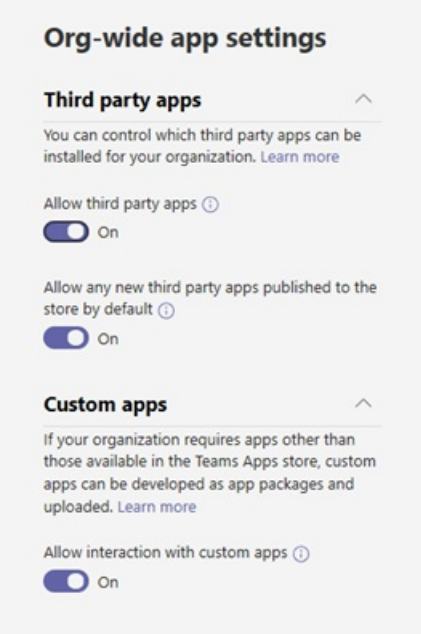
Resource-specific consent (RSC) permissions let team owners grant consent for an app to access and modify a team's data. RSC permissions are granular, Teams-specific permissions that define what an app can do in a specific team. You can view RSC permissions on the **Permissions** tab of the app details page for an app. To learn more, see View app permissions and grant admin consent in the Microsoft Teams admin center.

Manage org-wide app settings

Use org-wide app settings to control whether users can install third-party apps and whether users can upload or interact with custom apps in your organization. Org-wide app settings govern the behavior for all users and override any other app permission policies assigned to users. You can use them to control malicious or problematic apps.

> **NOTE**
>
> To learn how to use org-wide app settings in Microsoft 365 Government - GCC deployments of Teams, see Manage app permission policies in Teams.

1. On the Manage apps page, select **Org-wide app settings**. You can then configure the settings you want in the panel.



2. Under **Third-party apps**, turn off or turn on these settings to control access to third-party apps:

   - **Allow third-party apps**: This controls whether users can use third-party apps. If you turn off this setting, your users won't be able to install or use any third-party apps and the app status of these apps is displayed as **Blocked org-wide** in the table.

     > **NOTE**
     >
     > When **Allow third-party apps** is off, outgoing webhooks are disabled, which means that users can't create them. When this setting is on, outgoing webhooks are enabled for all users and you can control them at the user level by allowing or blocking the Outgoing Webhook app through app permission policies.
     >
     > Note that if you have existing app permission policies for **Microsoft apps** that use the **Allow specific apps and block all others** setting, and you want to enable outgoing webhooks for users, add the Outgoing Webhook app to the list.

   - **Allow any new third-party apps published to the store by default**: This controls whether new third-party apps that are published to the Teams app store become automatically available in Teams. You can only set this option if you allow third-party apps.

3. Under **Custom apps**, turn off or turn on **Allow interaction with custom apps**. This setting controls whether users can interact with custom apps. To learn more, see Manage custom app policies and settings in Teams.

4. Click **Save** for org-wide app settings to take effect.

Related topics

- Admin settings for apps in Teams

Admin settings for apps in Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

IMPORTANT

The Microsoft Teams admin center is gradually replacing the Skype for Business admin center, and we're migrating Teams settings to it from the Microsoft 365 admin center. If a setting has been migrated, you'll see a notification and then be directed to the setting's location in the Teams admin center. For more information, see Manage Teams during the transition to the Teams admin center.

Apps provide out-of-the-box tools for your organization to get more out of Teams. These apps combine the functionality of tabs, messaging extensions, connectors, and bots provided by Microsoft, built by a third-party, or by developers in your organization.

You manage apps for your organization in **Teams apps** in the admin center. (See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.) For example, you can allow or block apps at the org level, set policies to control what apps are available to Teams users, and customize Teams by pinning the apps that are most important for your users.

We're continually improving the app experience in Teams and adding features and functionality. Over time, we'll be building additional app management capabilities, so check back for the most up-to-date information on app policies.

Manage apps

Use the **Manage apps** page to view and manage all Teams apps in your organization's app catalog. You can see the org-level status and properties of apps, block or allow apps at the org level, upload new custom apps to your tenant catalog, and manage org-wide app settings.

The **Manage apps** page gives you a view into all available apps in your tenant catalog, providing you with the information you need to decide which apps to allow or block across your organization. You can then use app permission policies, app setup policies, and custom app policies and settings to configure the app experience for specific users in your organization.

To learn more, see Manage apps in Teams.

App permission policies

With app permission policies, you can control what apps are available to specific users in your organization. You can allow or block all apps or specific apps published by Microsoft, third-parties, and your organization.

For example, you can use app permission policies to:

- Gradually roll out new third-party or custom built apps to specific users.
- Simplify the user experience, especially when you start rolling out Teams across your organization.

To learn more, go to Manage app permission policies in Teams.

App setup policies

App setup policies let you customize the app experience for your users. You choose the apps that you want to pin to the app bar in the Teams clients and the order in which they appear, on web, desktop, and mobile clients.

Here's some examples of how you can use app setup policies:

- Drive awareness and adoption of core apps. For example, pin a custom recruiting and talent management app for users on your HR team.
- Selectively pin core Teams features, such as Chat, Teams, and Calling. Doing so can help ensure users are engaged in specific activities within Teams.

To learn more, check out Manage app setup policies in Teams.

Custom app policies and settings

Teams allows developers in your organization to build, test, and deploy custom apps to other users. Custom apps can be added to Teams by uploading an app package in a .zip file directly to a team or in the personal context. You can use app setup policies to control who in your organization can upload custom apps. You can also set org-wide settings to control whether users can interact with specific custom apps.

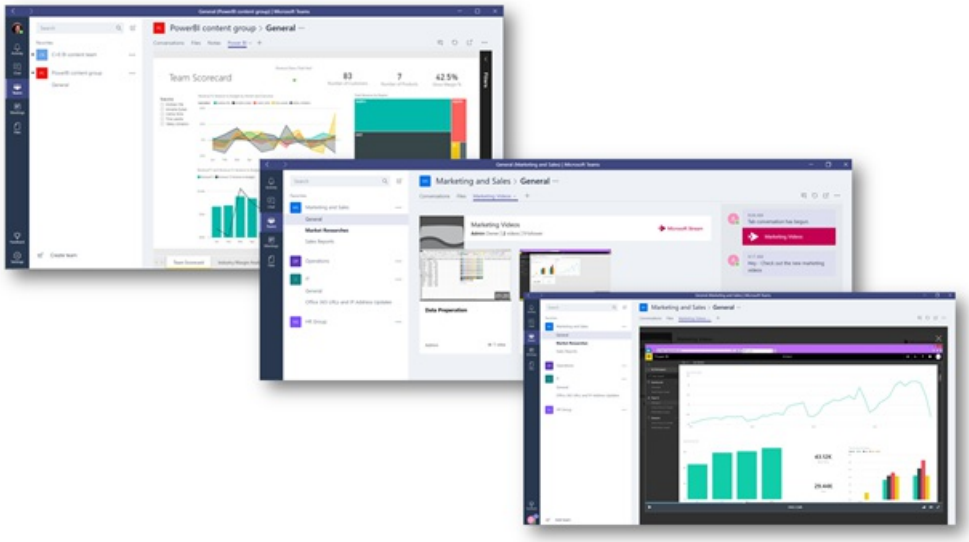
To learn more, go to Manage custom app policies and settings in Teams.

Use built-in and custom tabs in Microsoft Teams

9/22/2020 • 2 minutes to read • Edit Online

Tabs allow team members to access services and content in a dedicated space within a channel or in a chat. This lets the team work directly with tools and data, and have conversations about the tools and data, all within the context of the channel or chat.

Owners and team members can add tabs to a channel, private chat, and group chat to help integrate their cloud services. Tabs can be added to help users easily access and manage the data they need or interact with the most. This can be a Power BI report, a dashboard, or even a Microsoft Stream video channel where you publish training videos.

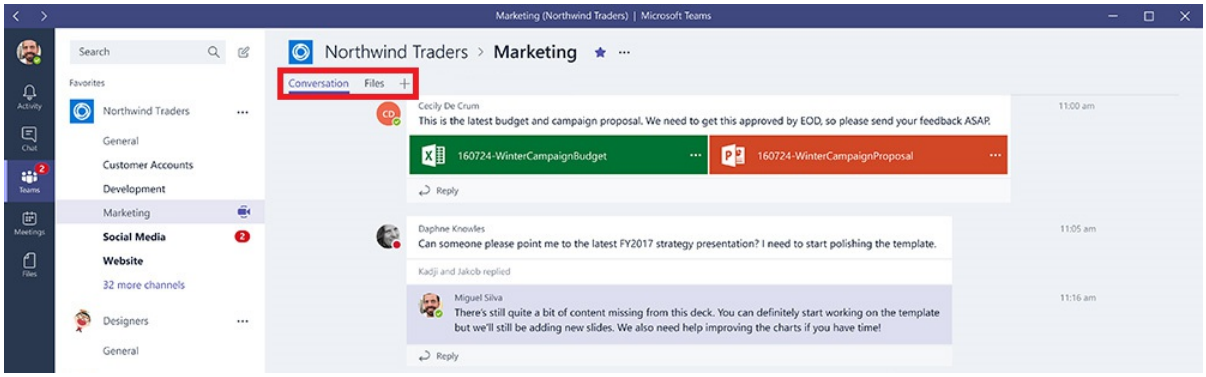


NOTE

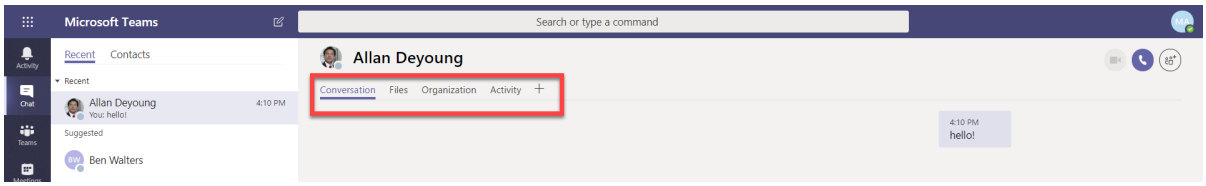
The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

Work with tabs

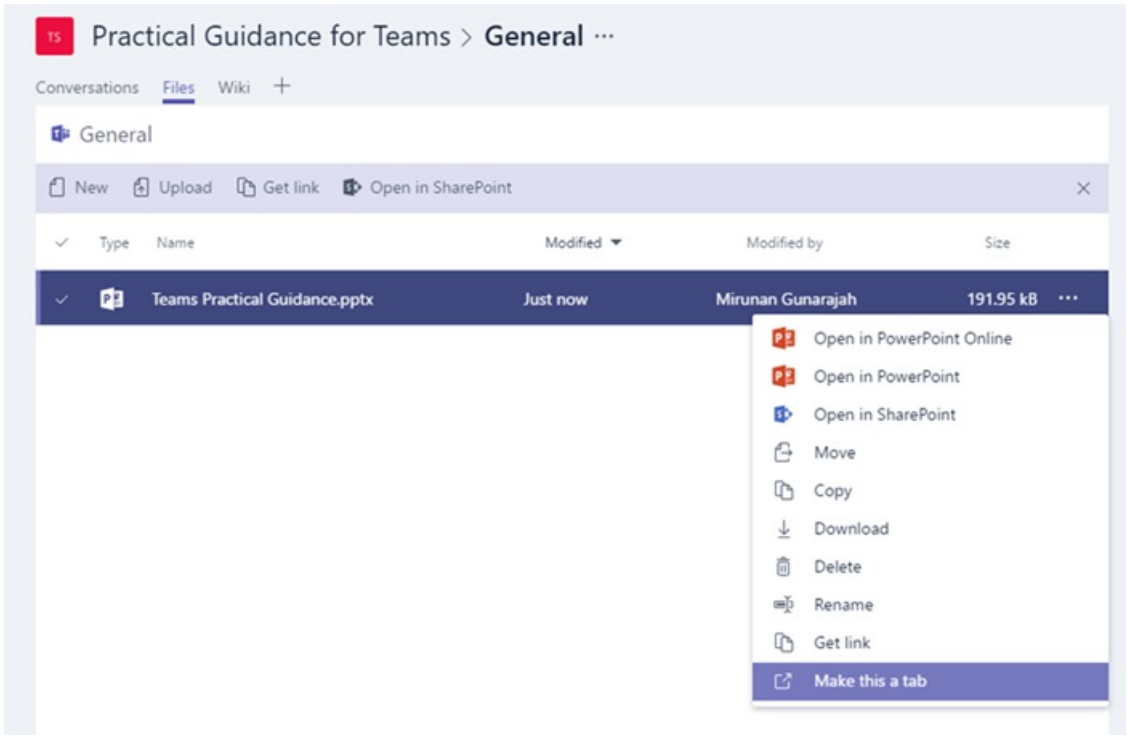
- With every new channel, two tabs are provisioned by default: Conversations and Files.



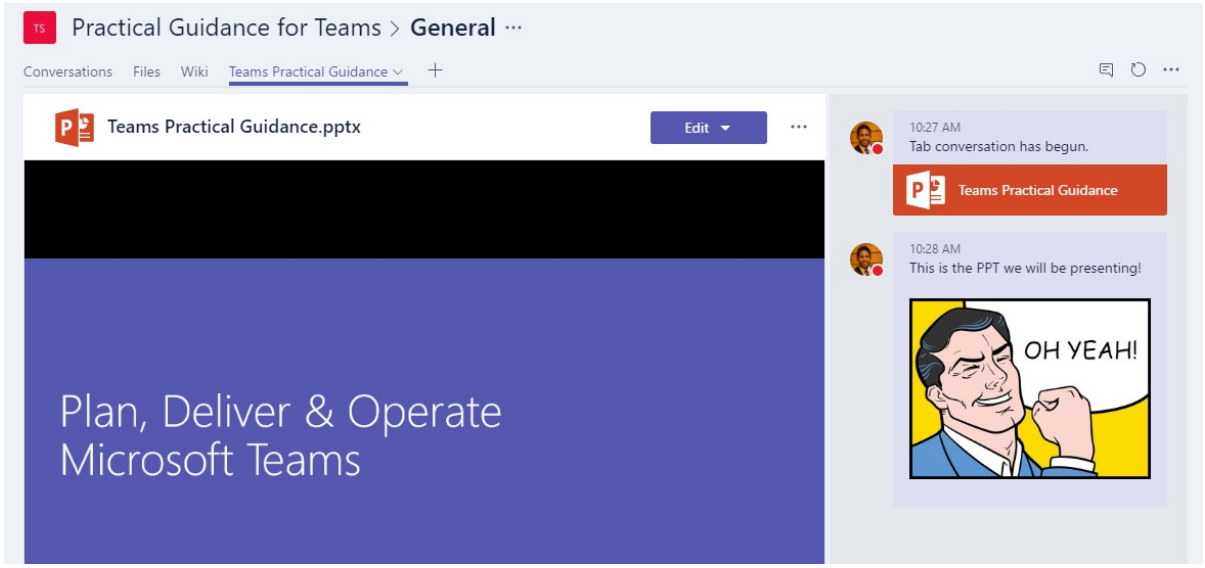
- With every private chat, four tabs are provisioned by default: Conversations, Files, Organization, and Activity.



- Owners and team members can add more tabs to a channel or chat by clicking **Add a tab** + at the top of the channel or chat.
- Excel, PowerPoint, Word, and PDF files must be uploaded to the **Files** tab before they can be converted to tabs. Any existing uploaded file can be converted to a tab with a single click, as shown below.

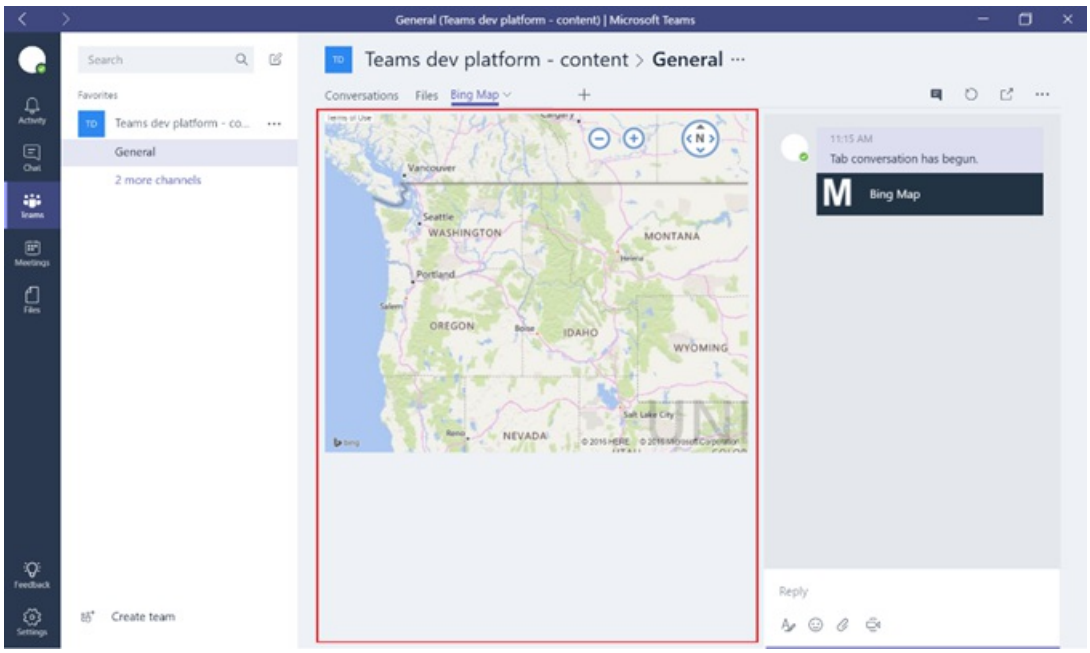


- To add a website, the URL must start with an **https** prefix so information that's exchanged remains secure.
- Detailed instructions are provided when a team member tries to add a custom tab to their channel or chat. When a custom tab is added to a channel, a **Tab conversation** is created that allows team members to have focused discussions about the content.



Develop custom tabs

In addition to the built-in tabs, you can design and develop your own tabs to integrate to Teams or share with the rest of the community. See our developer documentation for more information.



Use Microsoft 365 and custom connectors in Microsoft Teams

9/21/2020 • 2 minutes to read • Edit Online

Connectors keep your team current by delivering frequently used content and service updates directly into a channel. With connectors, your Microsoft Teams users can receive updates from popular services such as Trello, Wunderlist, GitHub, and Azure DevOps Services within the chat stream in their team.

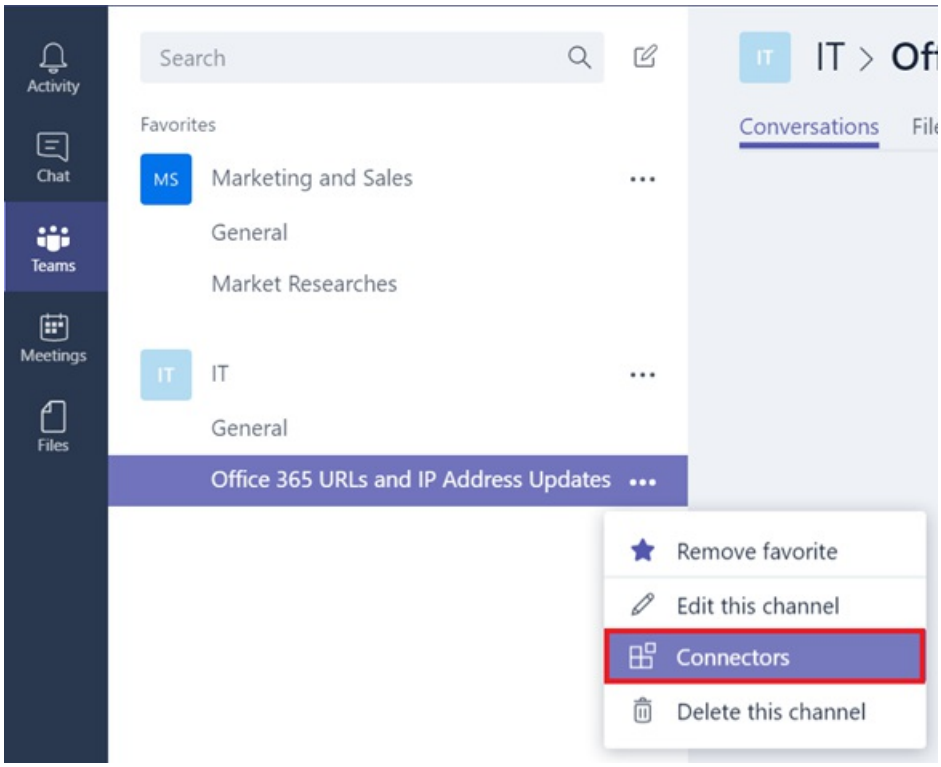
Any member of a team can connect their team to popular cloud services with the connectors if the team permissions allow, and all team members are notified of activities from that service. Connectors will continue to function even after the member who has initially setup the connector has left. Any team member with the permissions to add\remove can modify connectors setup by other members.

Microsoft 365 connectors can be used with both Microsoft Teams and Microsoft 365 groups, making it easier for all members stay in sync and receive relevant information quickly. Both Microsoft Teams and Exchange use the same connector model, which allows you to use the same connectors within both platforms. It is worth noting, however, that disabling connectors for the Microsoft 365 group that a team is dependent upon will disable the ability to create connectors for that team as well.

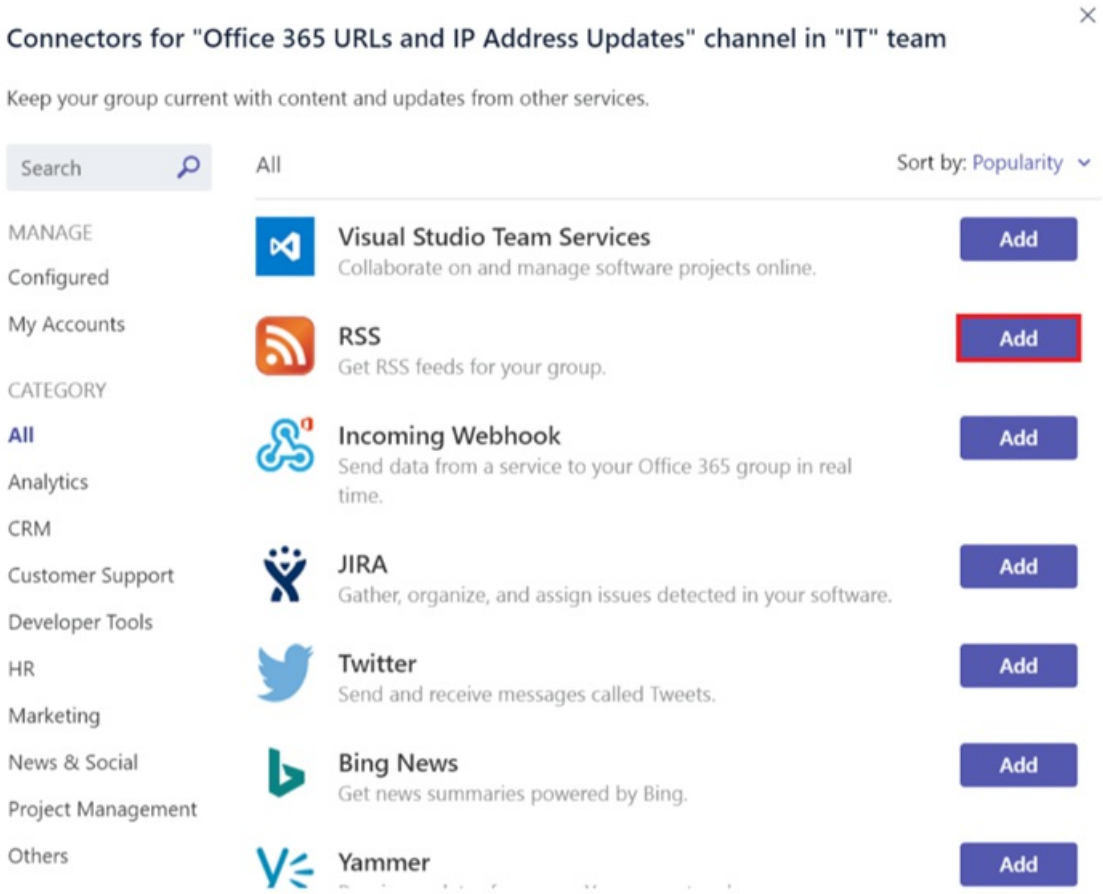
Add a connector to a channel

Currently, you can add connectors by using Microsoft Teams desktop and web clients. However, information posted by these connectors can be viewed in **all clients** including mobile.

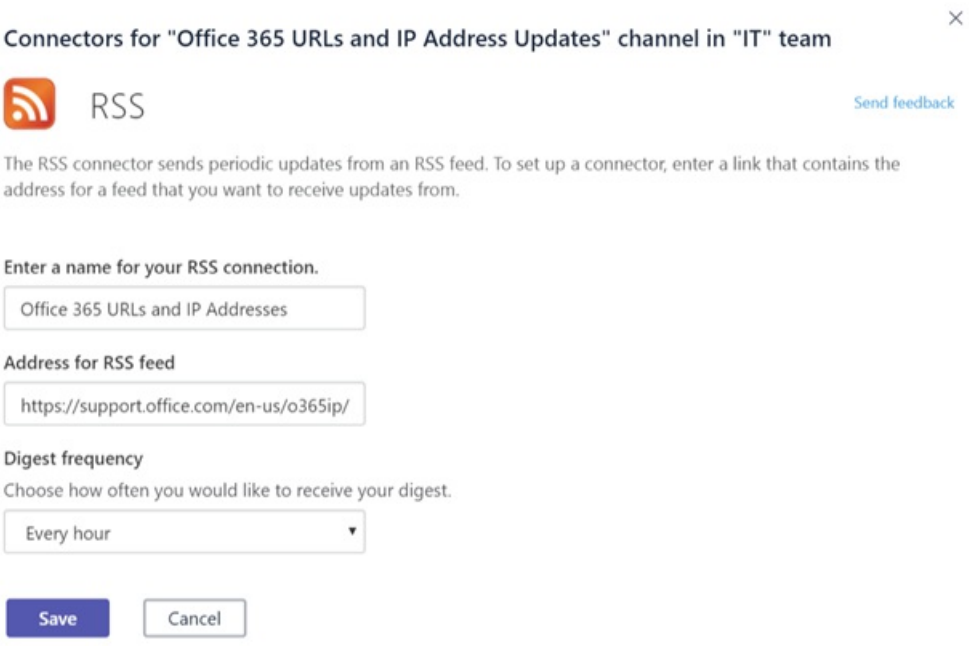
1. To add a connector to a channel, click the **ellipses (...),** on the right of a channel name, then click **Connectors**.



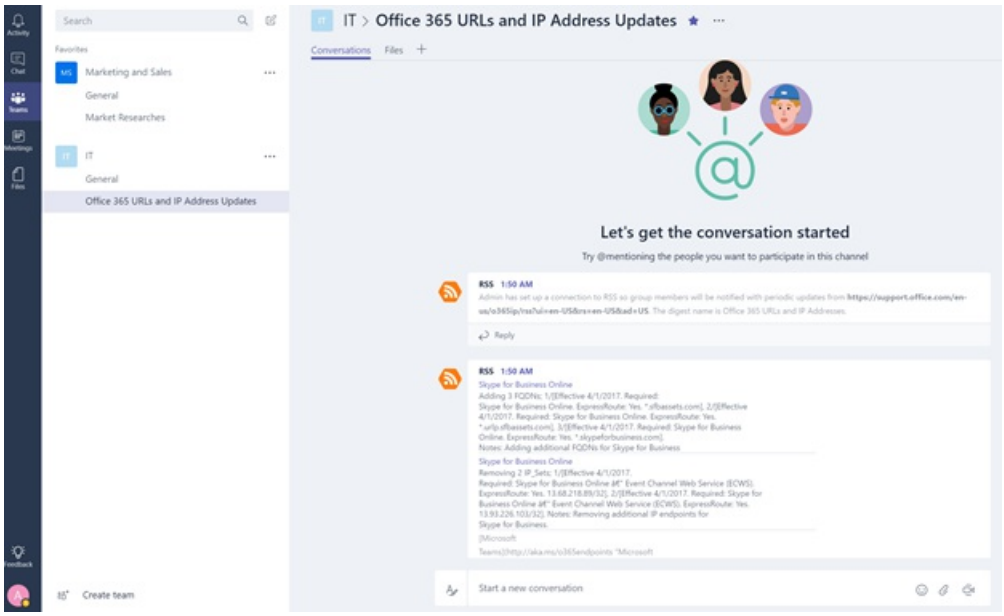
2. You can select from a variety of available connectors, and then click **Add**.



3. Fill in the required information of the selected connector and click **Save**. Each connector requires a diverse set of information to function properly, and some may require you to sign in to the service using the links provided on the connector configuration page.



4. Data provided by the connector is automatically posted to the channel.



Develop custom connectors

You can also build custom connectors, as well as incoming and outgoing webhooks. See our developer documentation for more information.

Resource-specific consent in Microsoft Teams

7/24/2020 • 4 minutes to read • Edit Online

This is a preview or early release feature.

Resource-specific consent in Microsoft Teams lets team owners give consent to apps to access team data. Examples of such access include the ability to read channel messages, create and delete channels, and create and remove channel tabs.

As an admin, you control whether team owners in your organization can give consent through settings that you configure by using the Azure Active Directory (Azure AD) PowerShell module or the Azure portal and the Microsoft Teams admin center.

Set whether team owners can give consent to apps

Here are the settings that you must set to control whether team owners can give consent to apps. Be sure to review all the following settings.

Settings in Azure AD

The following two settings determine whether team owners can give consent to apps.

> **IMPORTANT**
> Changing any of these settings doesn't affect data access for apps that were already granted consent. For example, if you configure these settings to prevent team owners from giving consent, these changes don't remove data access that's already been granted.

The "Users can consent to apps accessing company data on their behalf" setting

This setting controls whether users in your organization can consent to apps on their behalf. To enable team owners to give consent, this setting must be set to **Yes**. To manage this setting, do the following:

1. In the Azure portal, go to **Enterprise applications** > **User settings**.
2. Under **Enterprise applications**, set **Users can consent to apps accessing company data on their behalf** to **No** or **Yes**.

You can also manage this setting using PowerShell. To learn more, see Configure user content to applications.

The "EnableGroupSpecificConsent" setting

This setting controls whether users in your organization can consent to apps accessing company data for the groups that they own. This setting must be enabled for team owners to give consent. For steps on how to manage this setting by using PowerShell, see Configure group owner consent to apps accessing group data.

Settings in the Microsoft Teams admin center

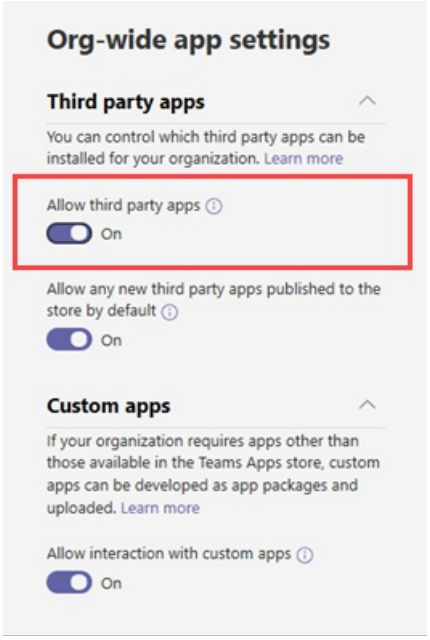
In addition to settings in Azure AD, org-wide app settings on the Manage apps page, whether an app is blocked or allowed on the Manage apps page, and the app permission policy assigned to the team owner determine whether a team owner can give consent.

> **IMPORTANT**
>
> Changing any of these settings doesn't affect data access for apps that were already granted consent. For example, if you disable third-party apps org-wide or if you block specific apps to prevent team owners from giving consent, these changes don't remove data access that's already been granted.

The "Allow third party apps" setting in org-wide app settings

This org-wide app setting controls whether users in your organization can use third-party apps. This setting must be on to enable team owners to give consent. To manage this setting, do the following:

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**, and then click **Org-wide app settings**.
2. Under **Third party apps**, turn off or turn on **Allow third party apps**.

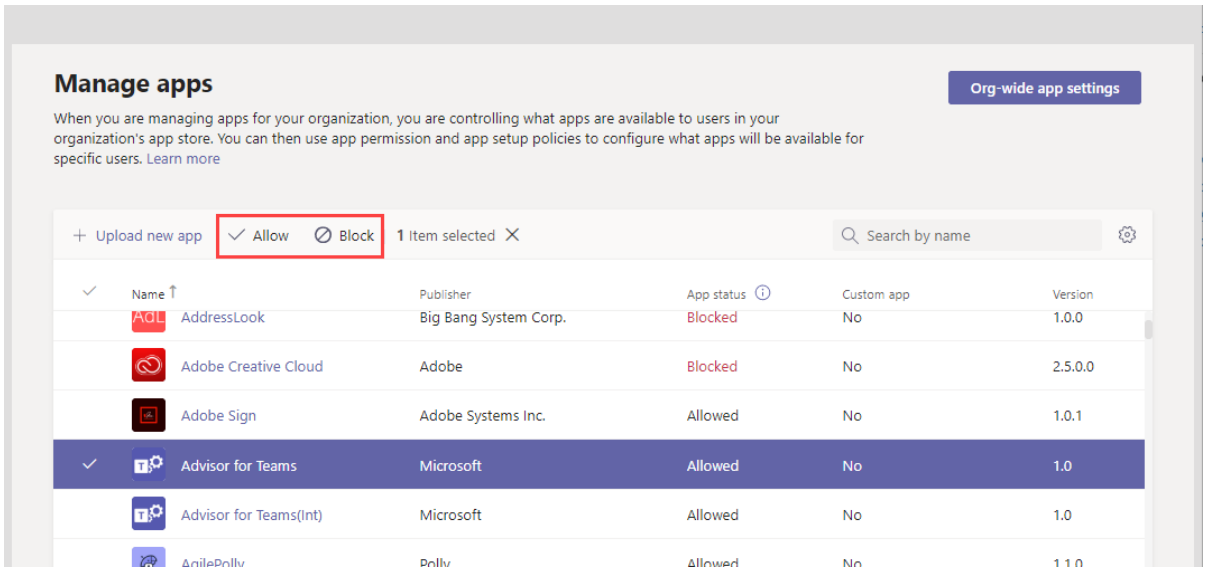


You may have to wait up to 24 hours for your changes to take effect.

Allow or block the app at the org level

When you block or allow an app on the Manage apps page, that app is blocked or allowed for all users in your organization. Team owners can only give consent to an app if the app is allowed. To allow or block an app at the org level, do the following:

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. On the Manage apps page, select the app, and then click **Block** to block it or click **Allow** to allow it.



App permission policy assigned to the team owner

Team owners can only give consent to apps that their app permission policy allows them to run. To view and manage the app permission policy that's assigned to a team owner, do the following:

1. In the left navigation of the Microsoft Teams admin center, go to **Users**.
2. Double-click the display name of the team owner, and then click **Policies**.
3. The policy assigned to the team owner is listed under **App permission policy**.
   - To assign a different policy, click **Edit**, and then select the policy that you want to assign.
   - To edit the settings of the policy that's assigned to the team owner, click the policy name, and then make the changes that you want.

Uploading custom apps

When uploading a custom app (also known sideloading) that uses resource-specific consent, the app must come from the tenant that it's being installed to. In other words, the Azure AD app registration must be from this tenant. Global admins are exempted from this restriction, and can upload custom apps from any tenant, either directly to a team (sideloading) or to the tenant app catalog.

Related topics

- Available RSC permissions
- Microsoft Graph
- Manage your apps in the Microsoft Teams admin center
- Manage app permission policies in Teams

Publish a custom app submitted through the Teams App Submission API

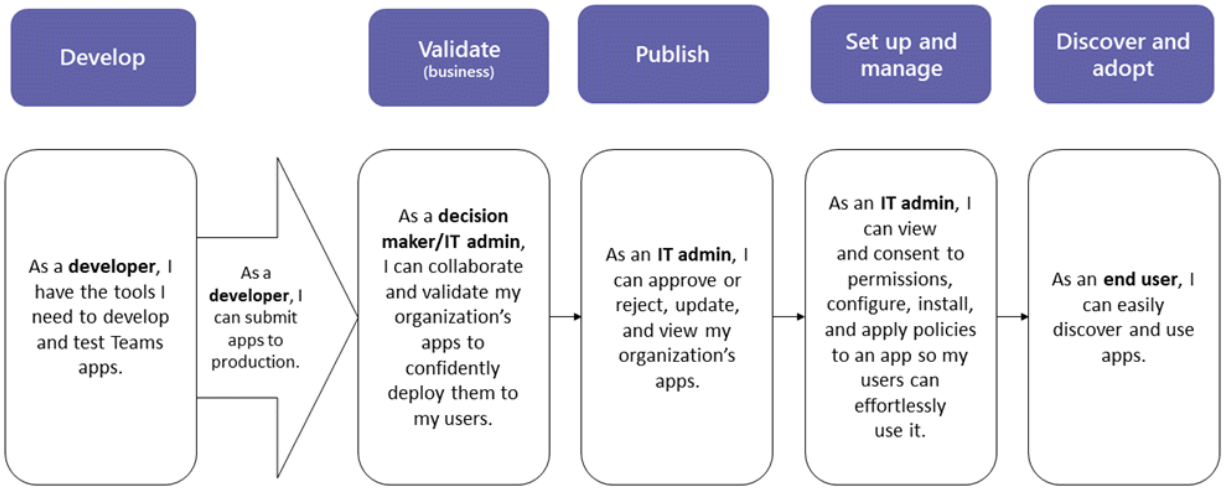
8/20/2020 • 6 minutes to read • Edit Online

Overview

> **NOTE**
>
> When you publish a custom Teams app, it's available to users in your organization's app store. There are two ways to publish a custom app and the way that you use depends on how you get the app. **This article focuses on how to approve and publish a custom app that a developer submits through the Teams App Submission API**. The other method, uploading a custom app, is used when a developer sends you an app package in .zip format. To learn more about that method, see Publish a custom app by uploading an app package.

This article provides end-to-end guidance for how to take your Teams app from development to deployment to discovery. You'll get an overview of the connected experiences that Teams provides across the app lifecycle to streamline how to develop, deploy, and manage custom apps in your organization's app store.

We'll cover each step of the lifecycle, including how developers can use the Teams App Submission API to submit custom apps directly to the Microsoft Teams admin center for you to review and approve, how to set policies to manage apps for users in your organization, and how your users discover them in Teams.



This guidance focuses on the Teams aspects of the app and is intended for admins and IT pros. For information about developing Teams apps, see the Teams developer documentation.

Develop

Create the app

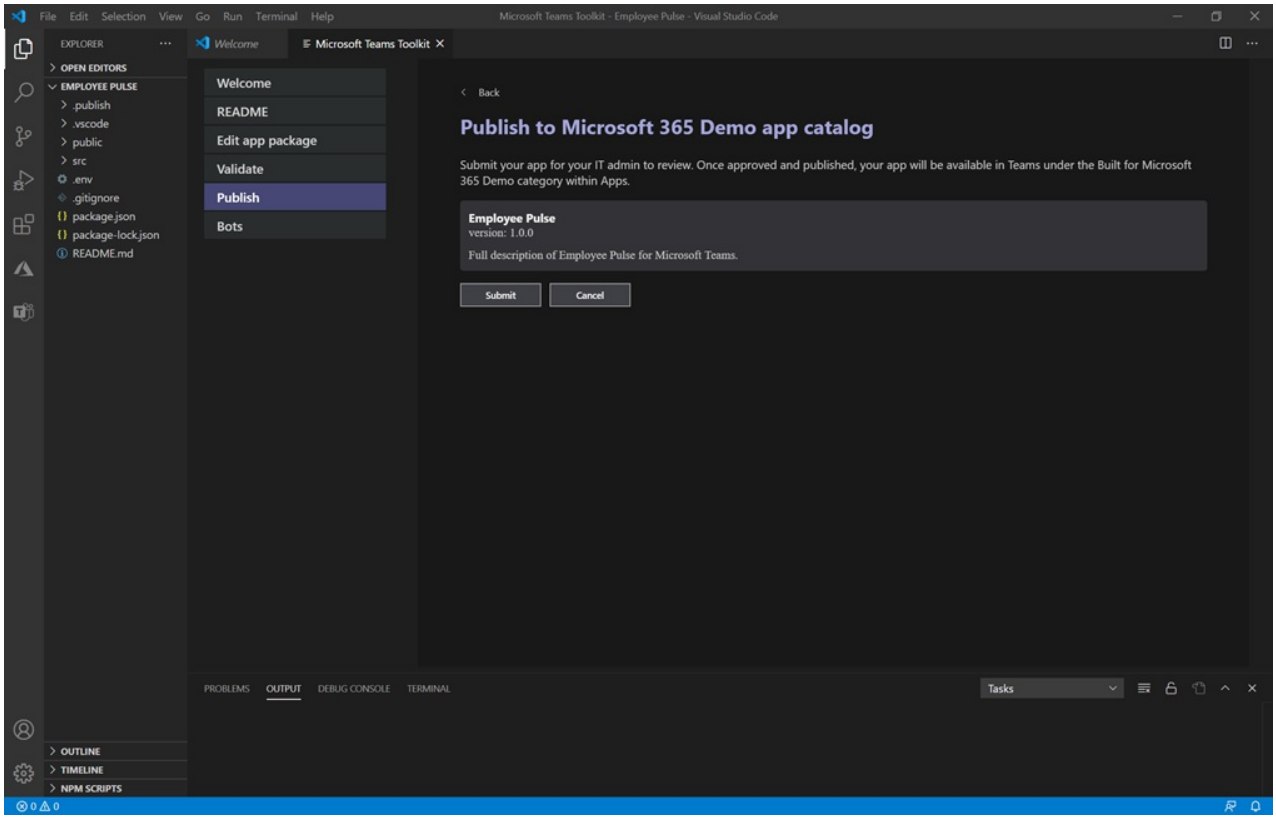
The Microsoft Teams developer platform makes it easy for developers to integrate your own apps and services to improve productivity, make decisions faster, and create collaboration around existing content and workflows. Apps built on the Teams platform are bridges between the Teams client and your services and workflows, bringing them directly into the context of your collaboration platform. For more information, go to the Teams developer documentation.

Submit the app

When the app is ready for use in production, the developer can submit the app using the Teams App Submission API, which can be called from Graph API, an integrated development environment (IDE) such as Visual Studio Code, or a platform such as Power Apps and Power Virtual Agents. Doing this makes the app available on the Manage apps page of the Microsoft Teams admin center, where you, the admin, can review and approve it.this

The Teams App Submission API, built on Microsoft Graph, allows your organization to develop on the platform of your choice and automates the submission-to-approval process for custom apps on Teams.

Here's an example of what this app submission step looks like in Visual Studio Code:



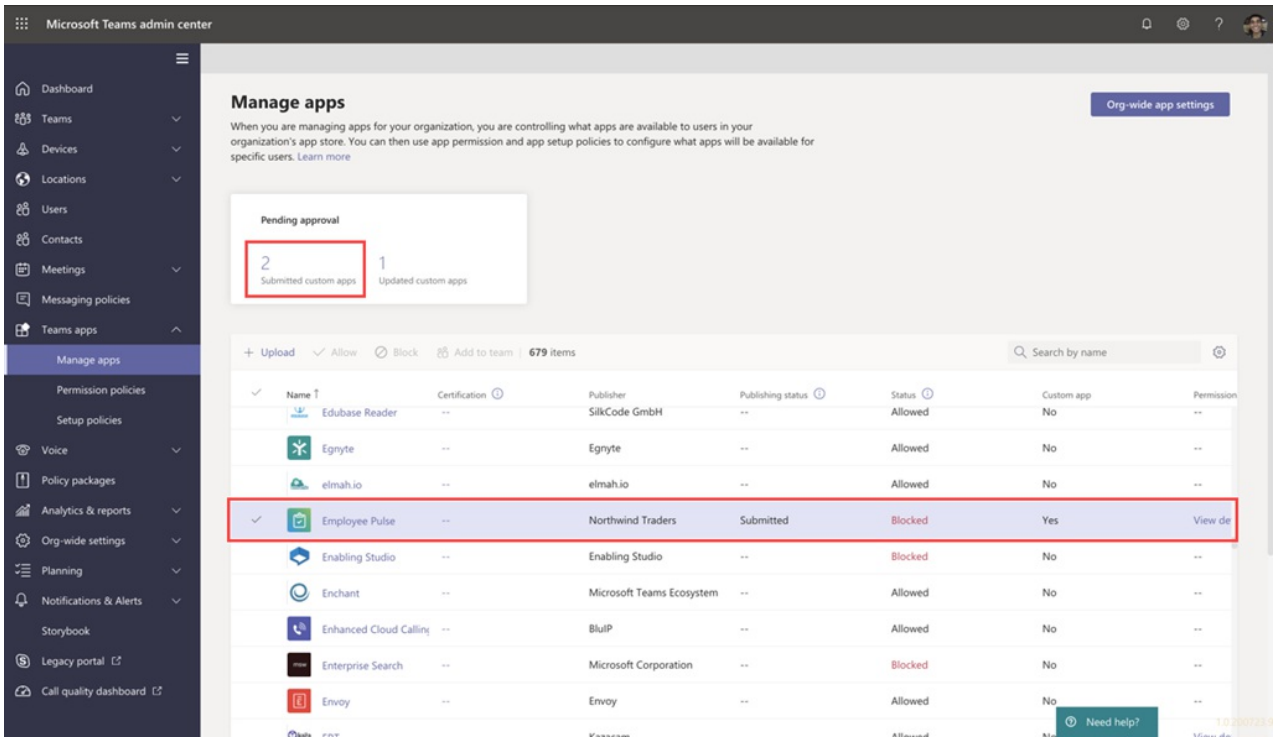
Keep in mind that this doesn't publish the app to your organization's app store yet. This step submits the app to the Microsoft Teams admin center where you can approve it for publishing to your organization's app store.

For more information about using the Graph API to submit apps, see here.

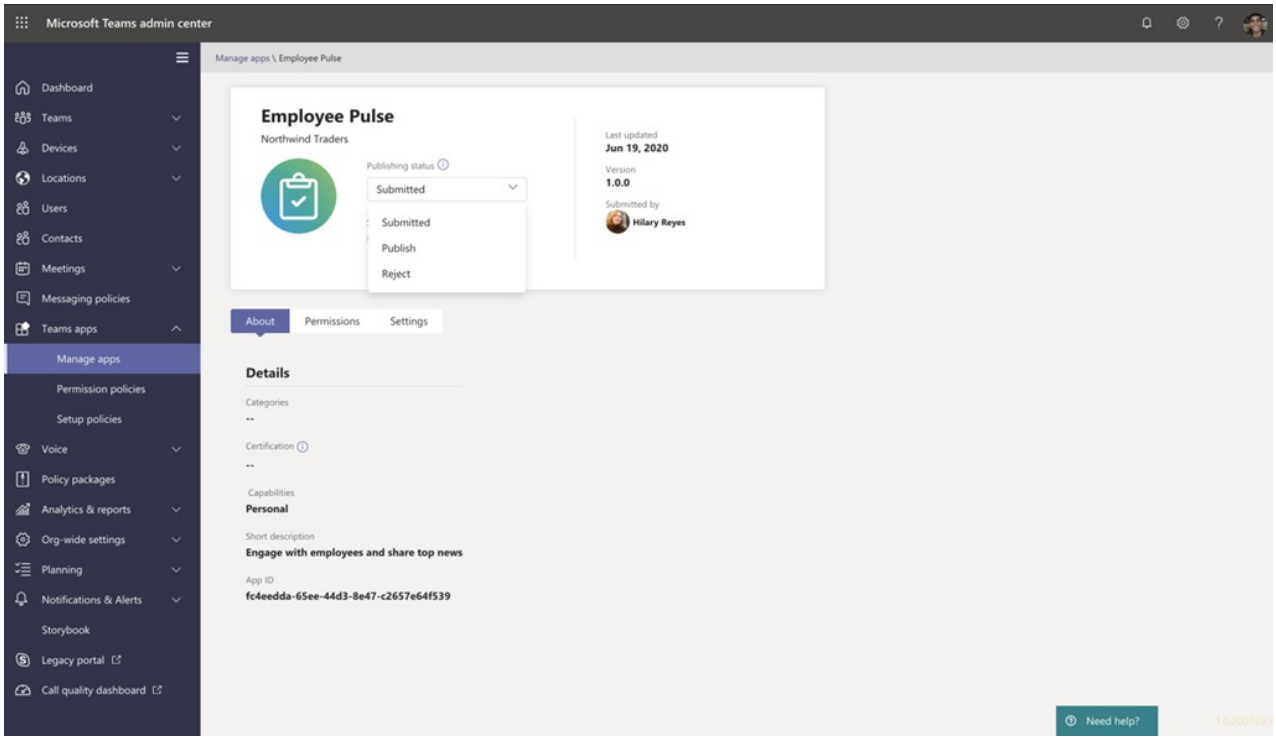
Validate

The Manage apps page in the Microsoft Teams admin center (in the left navigation, go to **Teams apps** > **Manage apps**), gives you a view into all Teams apps for your organization. The **Pending approval** widget at the top of the page lets you know when a custom app is submitted for approval.

In the table, a newly submitted app automatically shows a **Publishing status** of **Submitted** and **Status** of **Blocked**. You can sort the **Publishing status** column in descending order to quickly find the app.



Click the app name to go to the app details page. On the **About** tab, you can view details about the app, including description, status, submitter, and app ID.



For more information about using the Graph API to check the **Publishing status**, see here.

Publish

When you're ready to make the app available to users, publish the app.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. Click the app name to go to the app details page, and then in the **Publishing status** box, select **Publish**.

   After you publish the app, the **Publishing status** changes to **Published** and the **Status** automatically changes to **Allowed**.

Set up and manage

Control access to the app

By default, all users in your organization can access the app in your organization's app store. To restrict and control who has permission to use the app, you can create and assign an app permission policy. To learn more, see Manage app permission policies in Teams.

Pin and install the app for users to discover

By default, for users to find the app they have to go to your organization's app store and browse or search for it. To make it easy for users to get to the app, you can pin the app to the app bar in Teams. To do this, create an app setup policy and assign it to users. To learn more, see Manage app setup policies in Teams.

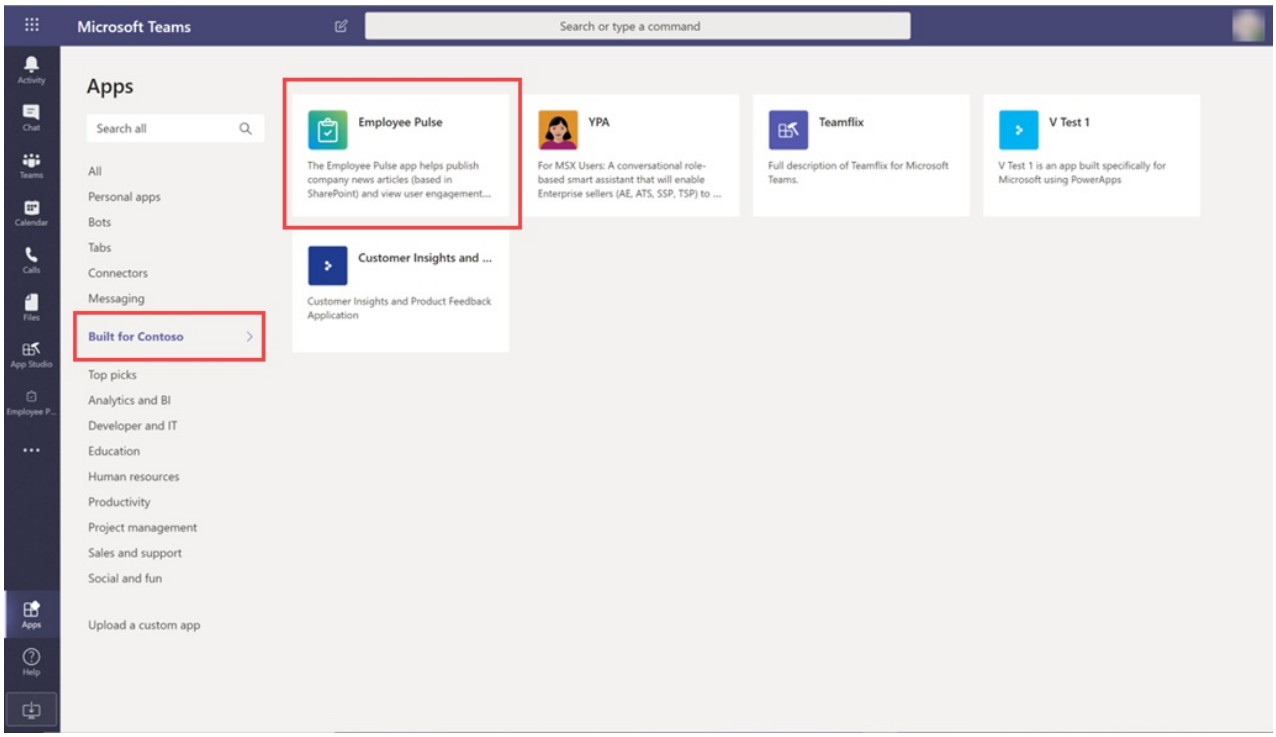
Search the audit log for Teams app events

You can search the audit log to view Teams apps activity in your organization. To learn more about how to search the audit log and to see a list of Teams activities that are logged in the audit log, see Search the audit log for events in Teams.

Before you can search the audit log, you have to first turn on auditing in the Security & Compliance Center. To learn more, see Turn audit log search on or off. Keep in mind that audit data is only available from the point at which you turned on auditing.

Discover and adopt

Users who have permissions to the app can find it in your organization's app store. Go to **Built for** ***Your Organization Name*** on the Apps page to find your organization's custom apps.

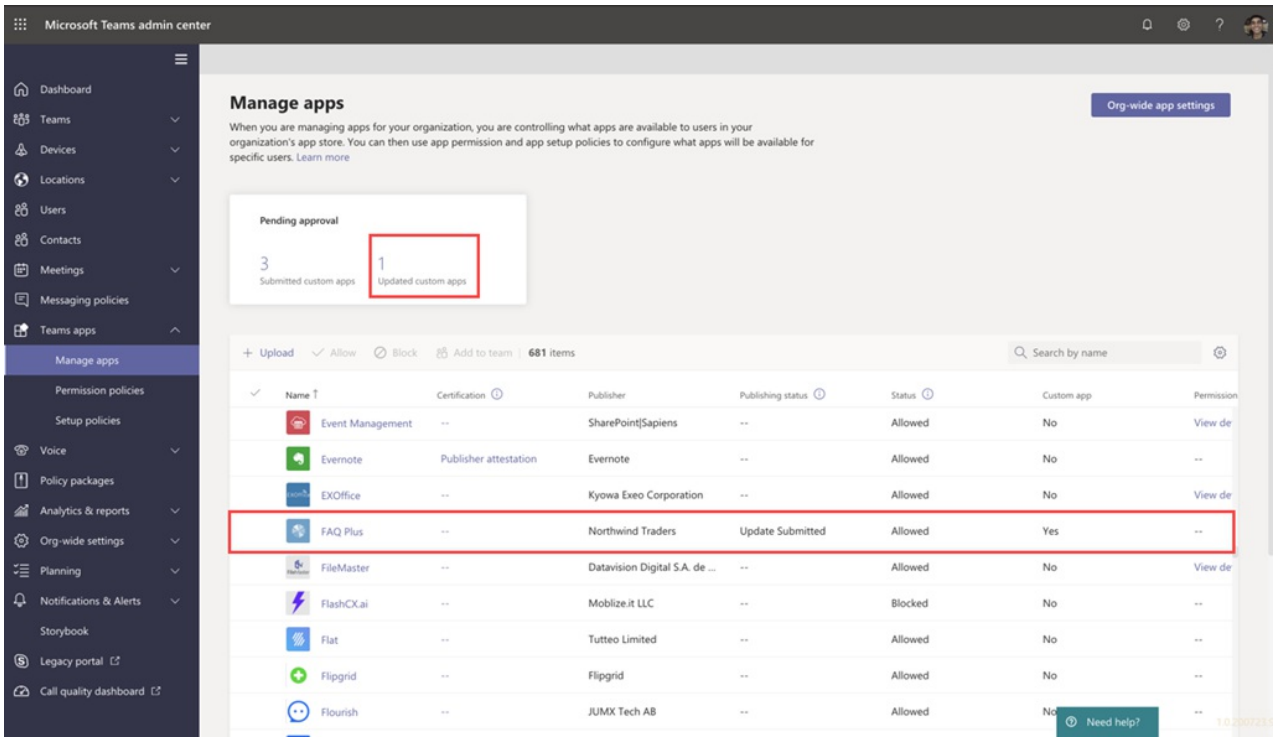


If you created and assigned an app setup policy, the app is pinned to the app bar in Teams for easy access for those users who were assigned the policy.

Update

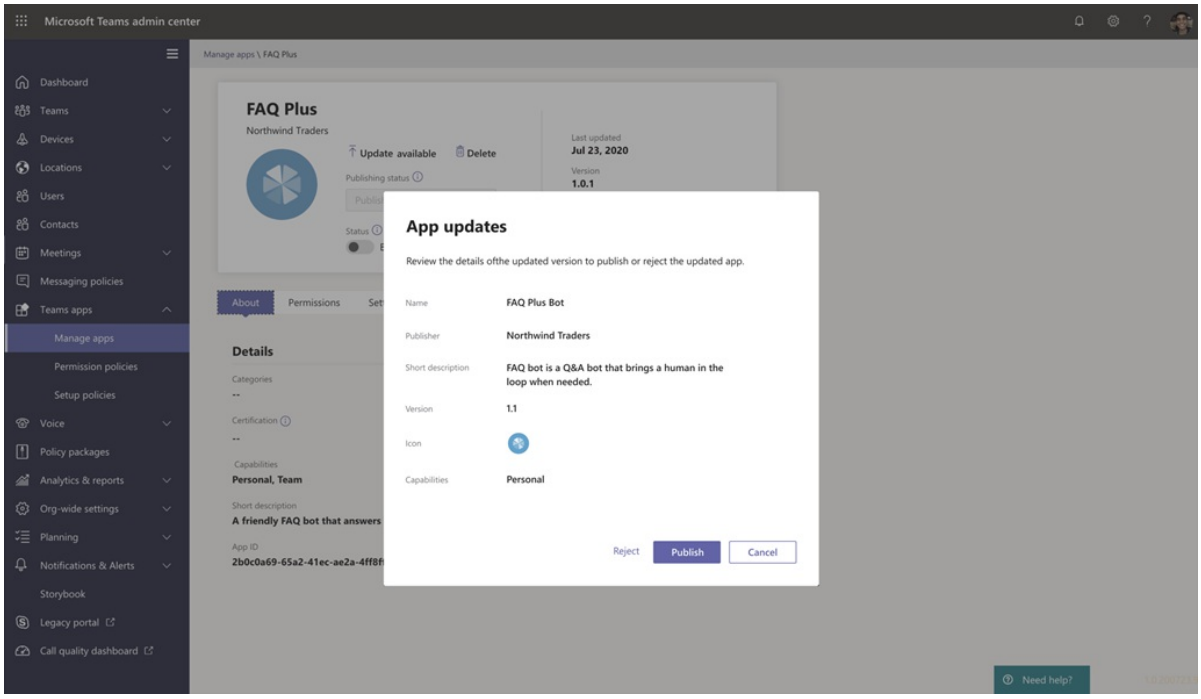
To update an app, developers should continue to follow the steps in the Develop section.

When the developer submits an update to a published custom app, you'll get notified in the **Pending approval** widget of the Manage apps page. In the table, the **Publishing status** of the app will be set to **Update submitted**.



To review and publish an app update:

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. Click the app name to go to the app details page, and then select **Update available** to review details of the update.



3. When you're ready, select **Publish** to publish the update. Doing this replaces the existing app, updates the version number, and changes the **Publishing status** to **Published**. All app permission policies and app setup policies remain enforced for the updated app.

   If you reject the update, the earlier version of the app remains published.

Keep in mind the following:

- When an app is approved, any one can submit an update to the app. This means other developers, including the developer who originally submitted the app, can submit an update to the app.

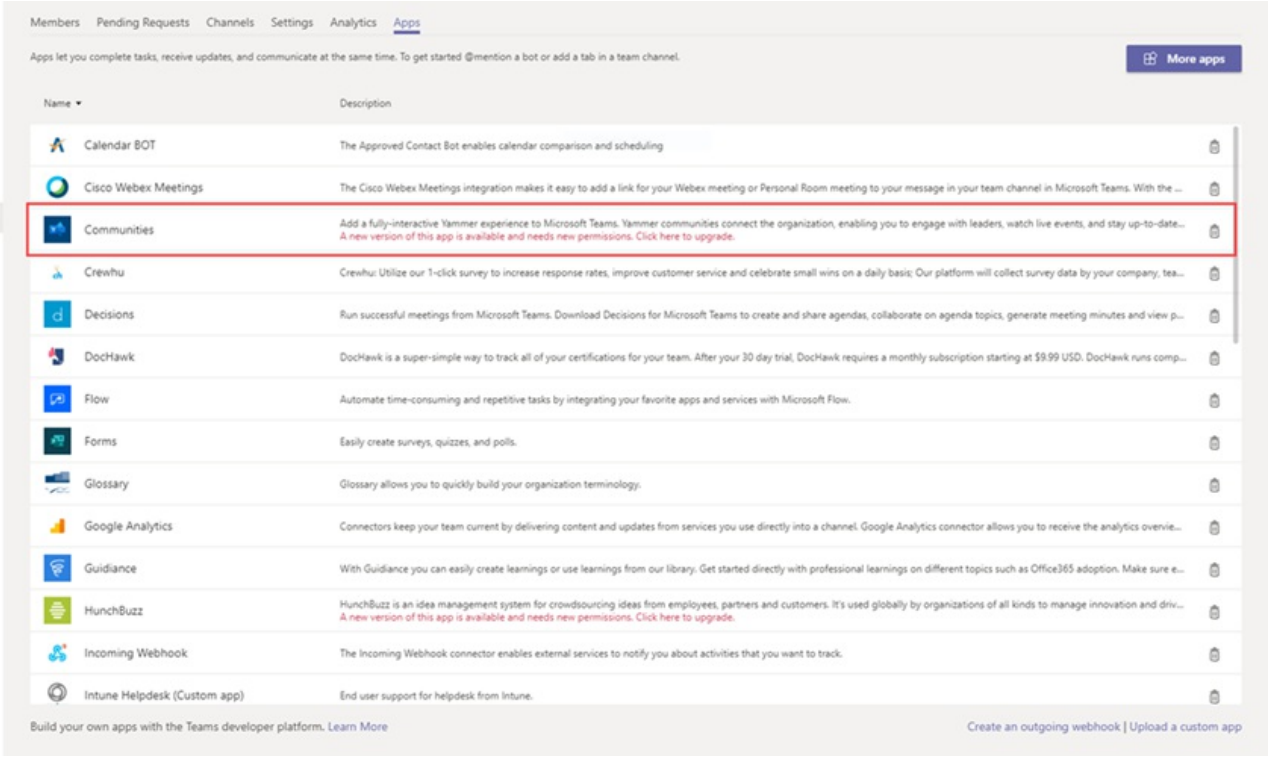
- When a developer submits an app and the request is pending, only that same developer can submit an update to the app. Other developers can submit an update only after the app is approved.

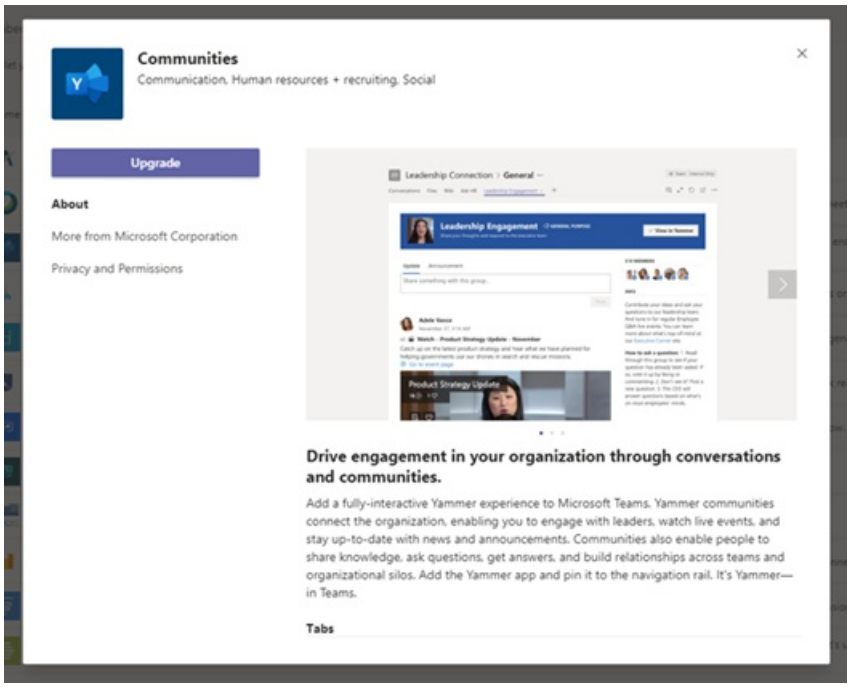
For more information about using the Graph API to update apps, see here.

Update experience for users

In most cases, after you publish an app update, the new version automatically appears for users. However, there are some updates to the Microsoft Teams manifest that require user acceptance to complete:

- A bot was added or removed
- An existing bot's "botId" property changed
- An existing bot's "isNotificationOnly" property changed
- The bot's "supportsFiles" property changed
- A messaging extension was added or removed
- A new connector was added
- A new static tab was added
- A new configurable tab was added
- Properties inside "webApplicationInfo" changed





Related topics

- Publish a custom app by uploading an app package
- Manage your apps in the Microsoft Teams admin center
- Manage custom app policies and settings in Teams
- Manage app permission policies in Teams
- Manage app setup policies in Teams
- Microsoft Graph API for Teams apps

Manage Microsoft Power Platform apps in the Microsoft Teams admin center

11/2/2020 • 5 minutes to read • Edit Online

Microsoft Power Platform apps in Teams

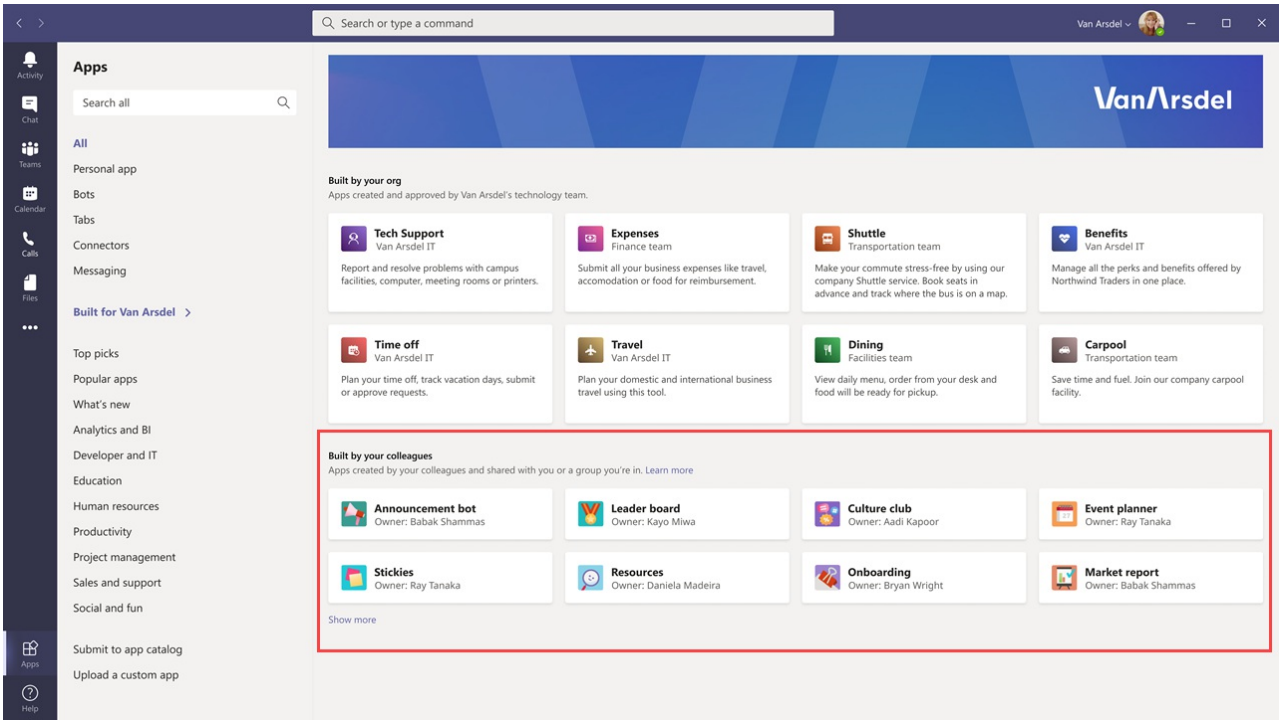
This article gives you an overview of how to manage Microsoft Power Platform apps in the Microsoft Teams admin center.

> **NOTE**
>
> This article applies to custom apps created by makers in your organization using Power Apps or Power Virtual Agents. These custom apps are automatically added to Teams. This article doesn't apply to the Power Apps app or Power Virtual Agents app that are installed from the Apps page or pinned to Teams through an app setup policy. You manage those apps as you would for any other app on the Manage apps page, using app permission policies, and app setup policies.

Power Apps is a low-code/no-code application development environment that makers in your organization can use to build custom apps that connect to your business data. Power Virtual Agents is a no-code bot building environment for makers to create powerful bots. With the integration of Microsoft Power Platform apps into Teams, organizations can streamline business processes, respond to changing business needs more rapidly to drive greater collaboration, and create and share custom solutions to be more productive.

Microsoft Power Platform apps created by makers in your organization are automatically added to Teams. Makers can control who can access their app by using the sharing feature in Power Apps and the sharing feature in Power Virtual Agents.

When a Microsoft Power Platform app is created or shared, users can view and install it on the Apps page by going to **Built for *Your Organization Name*** > **Built by your colleagues**. (It might take a few minutes after an app is created or shared for the app to appear here.)



A user will see an app in **Built by your colleagues** if the app meets one of the following conditions.

POWER APPS	POWER VIRTUAL AGENTS
• The user created the app. • The app was shared directly with the user. • The user recently used the app.	• The user created the bot. • The bot is owned by a team the user is a member of.

Users install Microsoft Power Platform apps in the same way they install any other Teams app. Keep in mind that users can only install apps to the context to which they have permissions, for example, a team they own, a chat that they're a part of, or their personal scope.

Manage access to Microsoft Power Platform apps in the Microsoft Teams admin center

As an admin, you can control whether Microsoft Power Platform apps are listed in **Built by your colleagues** on the Apps page in Teams. You can collectively block or allow all apps created in Power Apps or all apps created in Power Virtual Agents at the org level on the Manage apps page or for specific users using app permission policies.

The **Shared Power Apps** and **Shared Power Virtual Agent Apps** apps in your organization's app store represent all apps created on that particular platform. If you block one or both these apps at the org level or for specific users, those users can't see any apps from those platforms in **Built by your colleagues** and can't install them in Teams.

Keep in mind that you can control access to all apps created in Power Apps and Power Virtual Agents but you can't allow or block individual apps. Makers decide who can access the apps they create through the sharing feature from within Power Apps and Power Virtual Agents. If a maker shared an app they created in Power Virtual Agents with a user and you blocked **Shared Power Virtual Agents Apps** for that user, the user won't be able to see or install any apps from that platform in Teams.

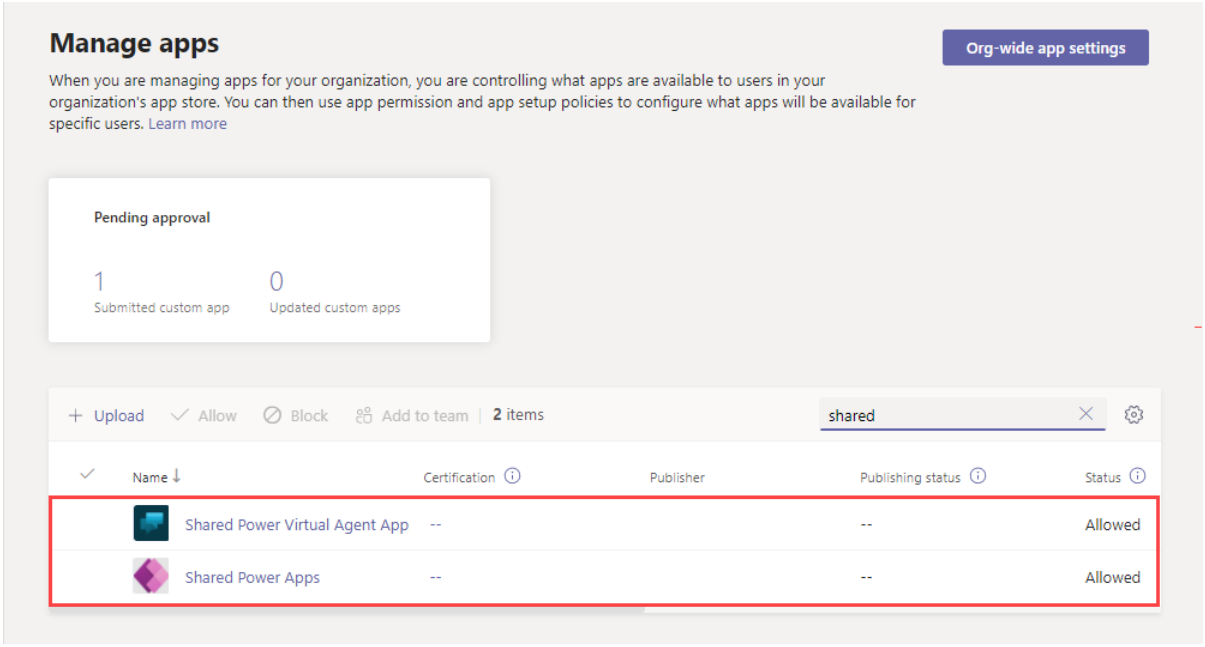
If a user is allowed to access apps from Power Apps or Power Virtual Agents, and you then block the user from accessing apps from one or both these platforms, the user can still access and use Microsoft Power Platforms apps that they installed before you blocked the app or apps. However, the user can no longer see or install any apps from those platforms in **Built by your colleagues**.

> **NOTE**
>
> The **Allow interaction with custom apps** org-wide app setting on the Manage apps page applies to everyone in your organization and governs whether they can interact with custom apps. Org-wide app settings govern the behavior for all users and override any other app permission policies assigned to users. By default, this setting is turned on. If this setting is turned off, users in your organization can't see or install any custom apps, including Microsoft Power Platform apps. To learn more, see Manage org-wide app settings.

Allow or block Microsoft Power Platform apps for your organization

By default, **Shared Power Apps** and **Shared Power Virtual Agent Apps** are allowed for all Teams users in your organization. You can block or allow them at the org level on the Manage apps page of the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**. You must be a global admin or Teams service admin to access the page.
2. In the list of apps, do one of the following.

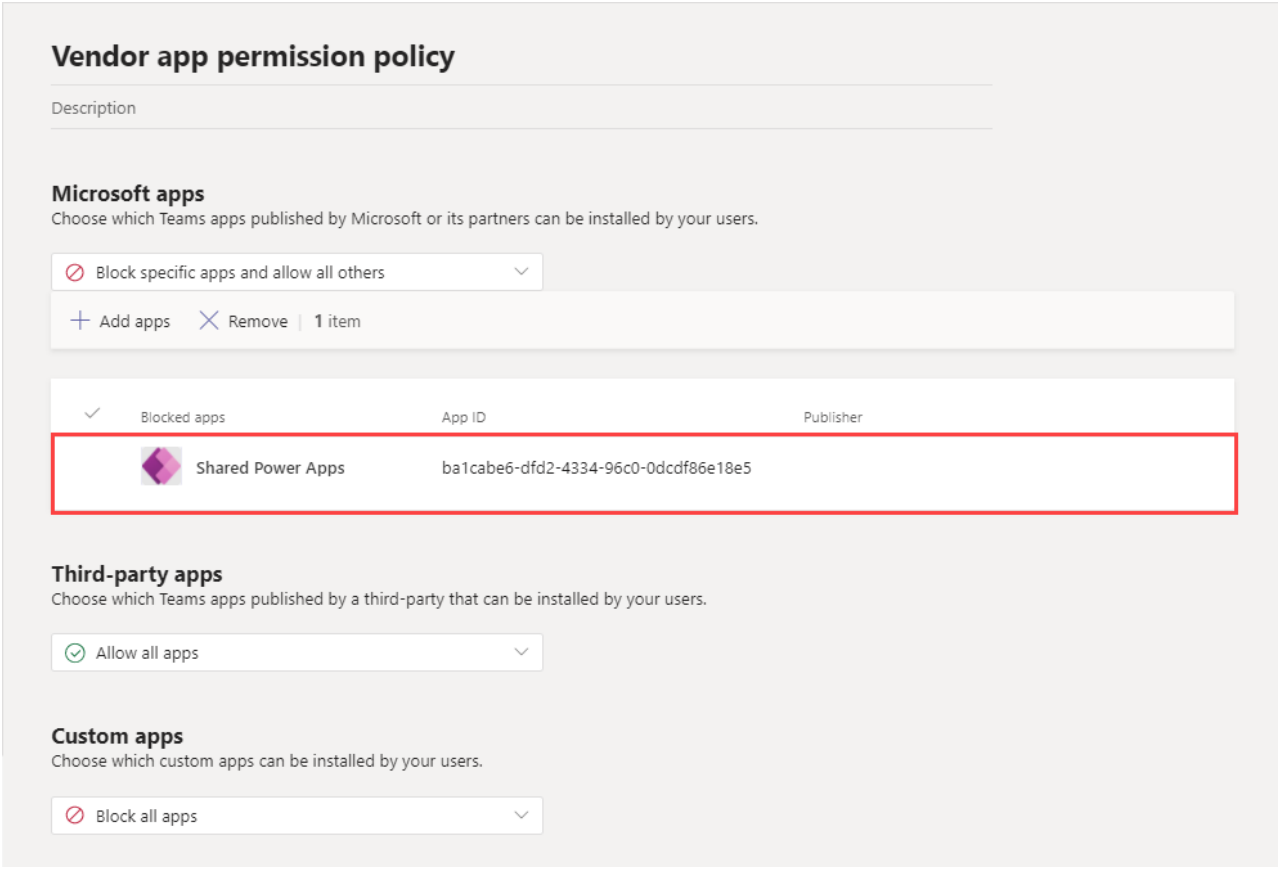


- To block apps created in Power Apps or Power Virtual Agents for all users in your organization, search for **Shared Power Apps** or **Shared Power Virtual Agent Apps**, select it, and then click **Block**.
- To allow apps created in Power Apps or Power Virtual Agents for all users in your organization, search for **Shared Power Apps** or **Shared Power Virtual Agent Apps**, select it, and then click **Allow**.

Allow or block Microsoft Power Platform apps for specific users

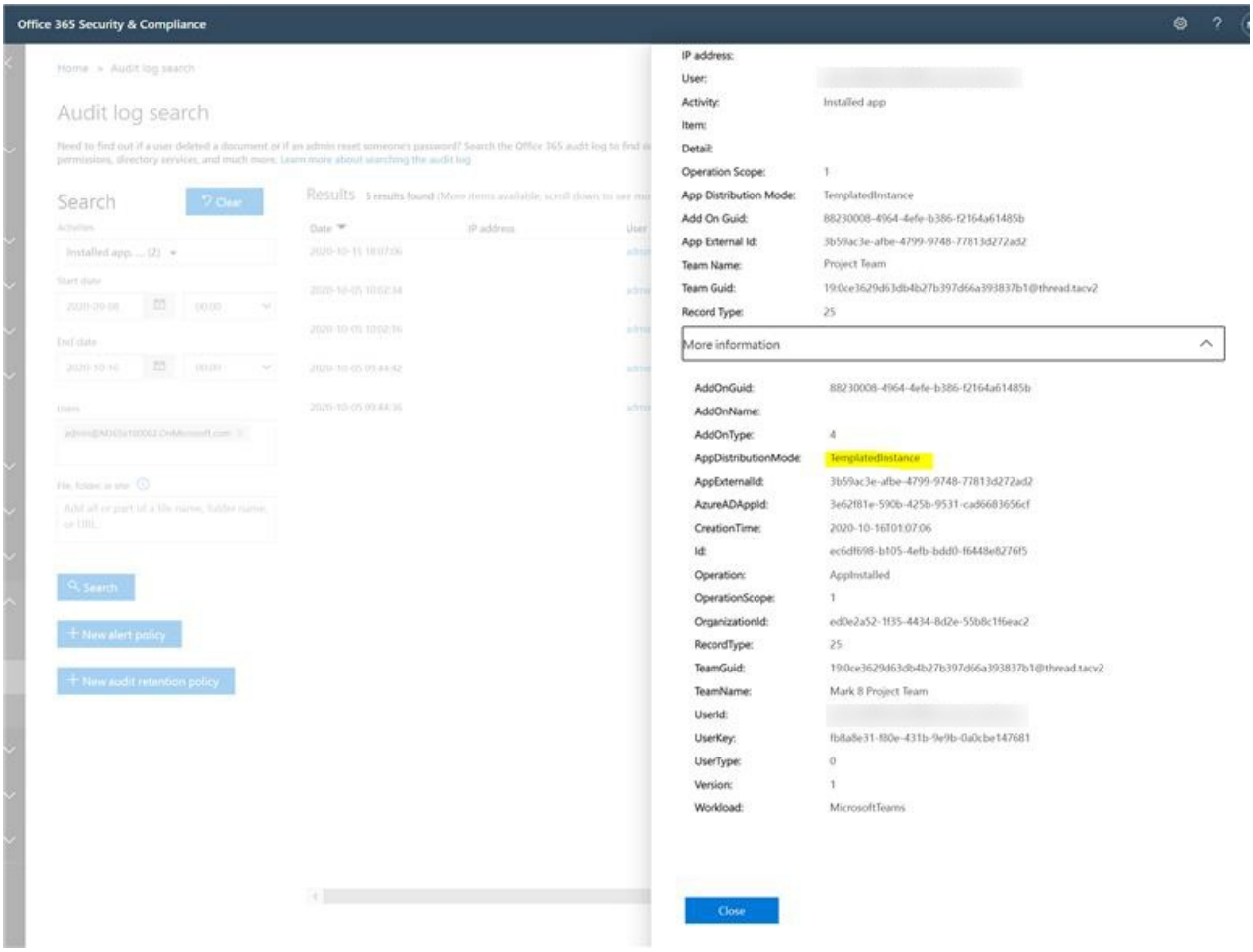
To allow or block specific users in your organization from accessing apps created in Power Apps or Power Virtual Agents, create and assign one or more custom app permission policies.

For example, to block specific users from accessing apps created in Power Apps, create a custom app permission policy to block **Shared Power Apps**, and then assign the policy to those users.



Use audit logs to investigate Microsoft Power Platform installation activity

You can use audit logs for Teams to investigate events where users installed Microsoft Power Platform apps from the **Built by your colleagues** section of the Apps page in Teams. To do this, search the audit log for the **Installed app** Teams event (under the **AppInstalled** operation) for a user or set of users. To find apps installed from **Built by your colleagues**, look for the **TemplatedInstance** value in the **AppDistributionMode** property in a given record's details.



NOTE

You can export audit records in CSV format for easier filtering.

Related topics

- Share a canvas app in Power Apps
- Share your bot with other users
- Manage apps in the Microsoft Teams admin center
- Manage app permission policies in Teams
- Publish a custom app submitted through the Teams App Submission API

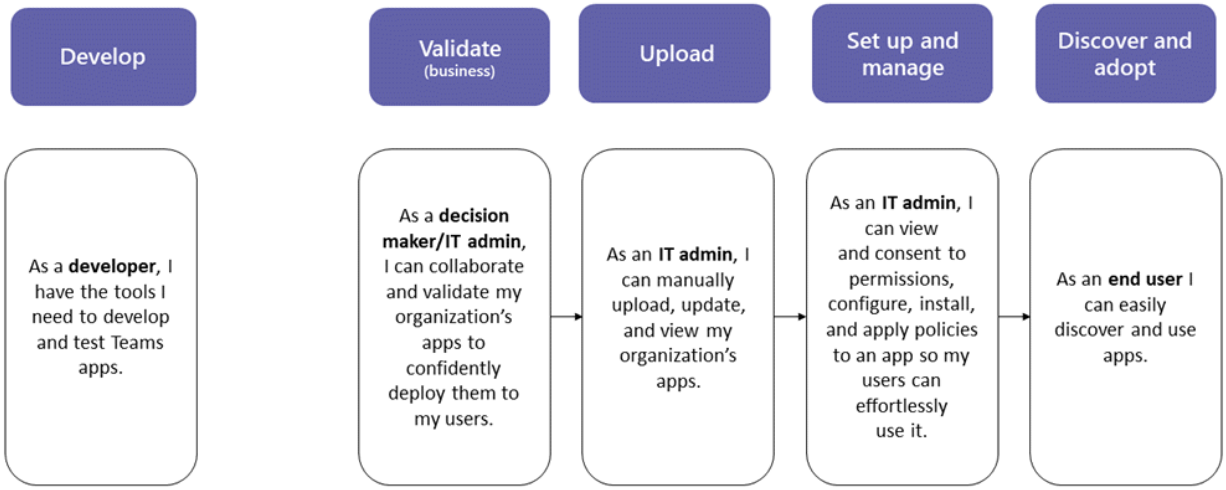
Publish a custom app by uploading an app package

8/6/2020 • 6 minutes to read • Edit Online

NOTE

When you publish a custom Teams app, it's available to users in your organization's app store. There are two ways to publish a custom app and the way that you use depends on how you get the app. **This article focuses on how to publish a custom app by uploading an app package (in .zip format) that a developer sends you**. The other method, approving a custom app, is used when a developer submits an app directly to the Manage apps page through the Teams App Submission API. To learn more about that method, see Publish a custom app submitted through the Teams App Submission API.

This article provides end-to-end guidance for how to take your Teams app from development to deployment to discovery. This guidance focuses on the Teams aspects of the app and is intended for admins and IT pros. For more information about developing Teams apps, see the Teams developer documentation.



Develop

Create your app

The Microsoft Teams developer platform makes it easy for developers to integrate your own apps and services to improve productivity, make decisions faster, and create collaboration around existing content and workflows. Apps built on the Teams platform are bridges between the Teams client and your services and workflows, bringing them directly into the context of your collaboration platform. For more information, go to the Teams developer documentation.

Validate

Get the app package

When the app is ready for use in production, the developer should produce an app package. They can use App Studio for that. They'll send you the file in .zip format.

Microsoft uses these guidelines to ensure apps comply with the quality and security standards of the global Teams apps store.

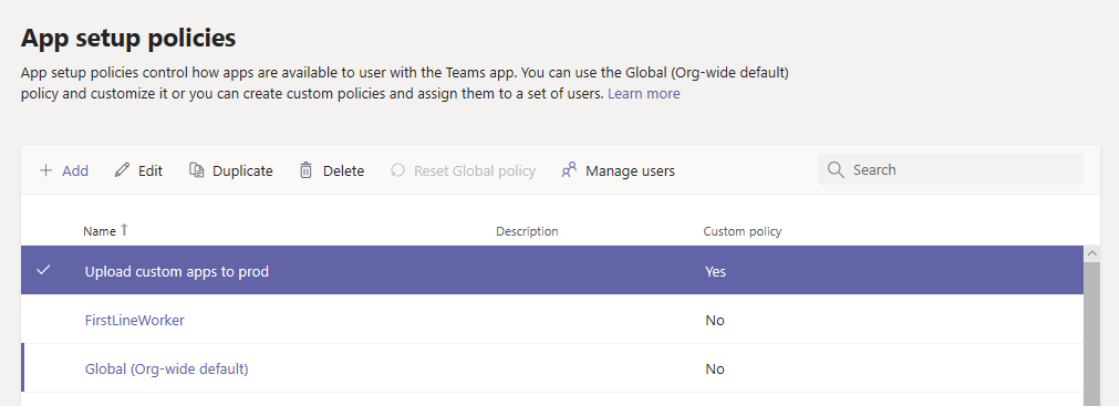
Allow trusted users to upload custom apps

To validate that the app is working correctly in your production tenant, you need to allow yourself and/or trusted users to upload custom apps in the production tenant. You use app setup policies to do this.

> **NOTE**
>
> If you're uncomfortable with uploading the app to your production tenant for validation, even for yourself or trusted users, you can skip this step and follow the steps in the Upload and Set up and manage sections to publish the unvalidated app to your organization's app store. Then, restrict access to that app to only yourself and users you trust. These users can then get the app from your organization's app store to perform validation. After the app is validated, use the same permission policies to open access and roll the app out for production use.

To allow trusted users to upload custom apps, follow these steps:

1. Turn on the **Allow interaction with custom apps** org-wide app setting. To do this:
   a. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**, and then click **Org-wide app settings**.
   b. Under **Custom apps**, turn on **Allow interaction with custom apps**, and then click **Save**.
2. Turn off the **Upload custom apps** setting in the global app setup policy. To do this:
   a. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**, and then click the **Global (Org-wide default)** policy.
   b. Turn off **Upload custom apps**, and then click **Save**.
3. Create a new app setup policy that allows uploading custom apps and assign it to your set of trusted users. To do this:
   a. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**, and then click the **Add**. Give the new policy a name and description, turn on **Upload custom apps**, and then click **Save**.
   b. Select the new policy you created, and then click **Manage users**. Search for a user, click **Add**, and then click **Apply**. Repeat this step to assign the policy to all your trusted users.

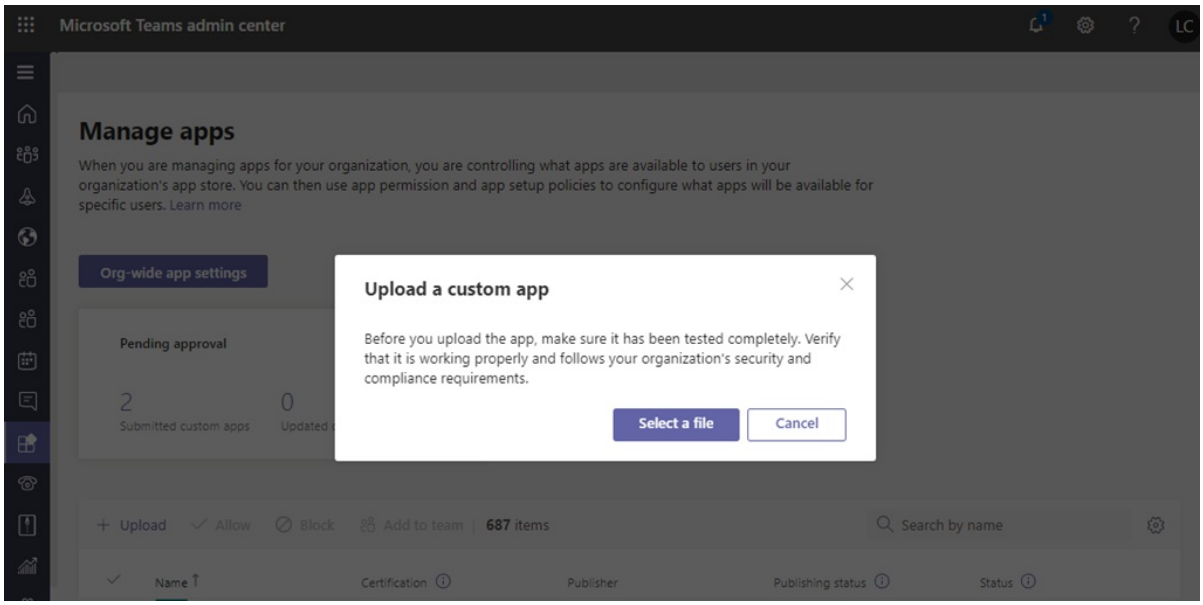


These users can now upload the app manifest to validate that the app is working correctly in the production tenant.

Upload

To make the app available to users in your organization's app store, upload the app. You can do this on the Manage apps page of the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. Click **Upload**, click **Select a file**, and then select the app package that you received from the developer.



Set up and manage

Control access to the app

By default, all users in your organization can access the app in your organization's app store. To restrict and control who has permission to use the app, you can create and assign an app permission policy. To learn more, see Manage app permission policies in Teams.

Pin and install the app for users to discover

By default, for users to find the app they have to go to your organization's app store and browse or search for it. To make it easy for users to get to the app, you can pin the app to the app bar in Teams. To do this, create an app setup policy and assign it to users. To learn more, see Manage app setup policies in Teams.

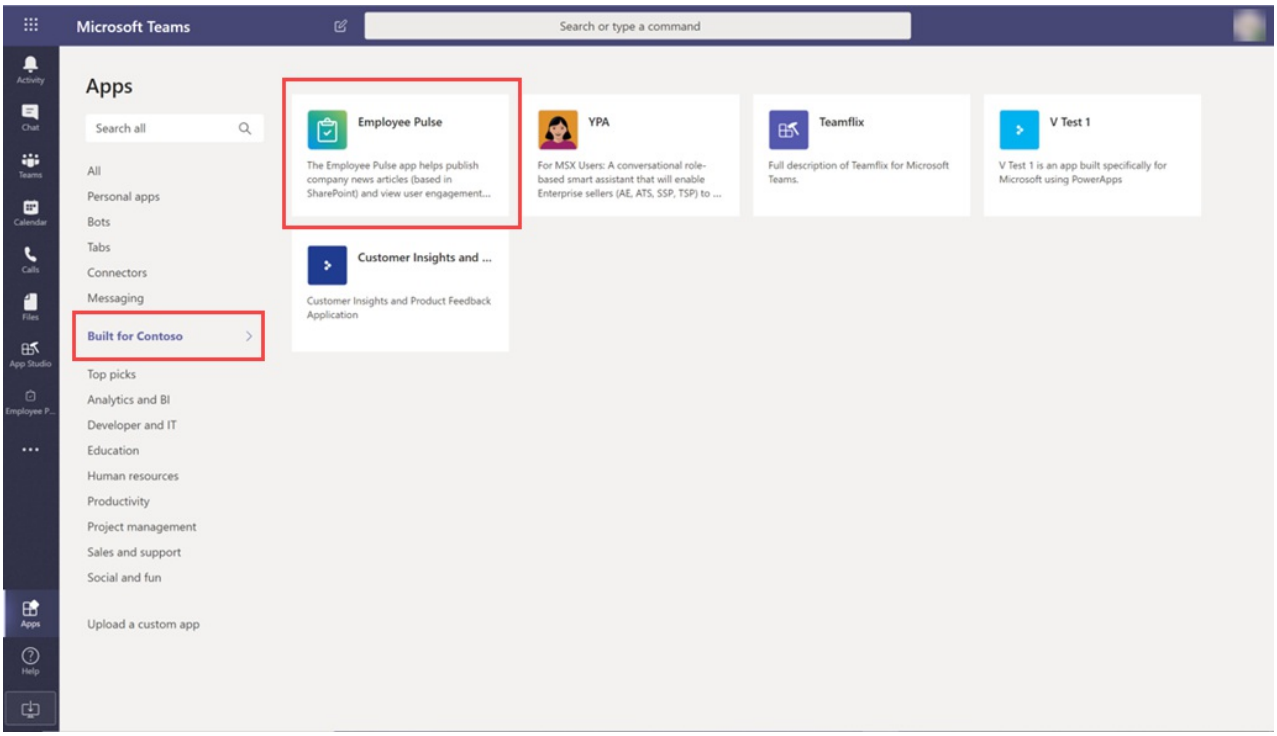
Search the audit log for Teams app events

You can search the audit log to view Teams apps activity in your organization. To learn more about how to search the audit log and to see a list of Teams activities that are logged in the audit log, see Search the audit log for events in Teams.

Before you can search the audit log, you have to first turn on auditing in the Security & Compliance Center. To learn more, see Turn audit log search on or off. Keep in mind that audit data is only available from the point at which you turned on auditing.

Discover and adopt

Users who have permissions to the app can find it in your organization's app store. Go to **Built for *Your Organization Name*** on the Apps page to find your organization's custom apps.



If you created and assigned an app setup policy, the app is pinned to the app bar in Teams for easy access for those users who were assigned the policy.

Update

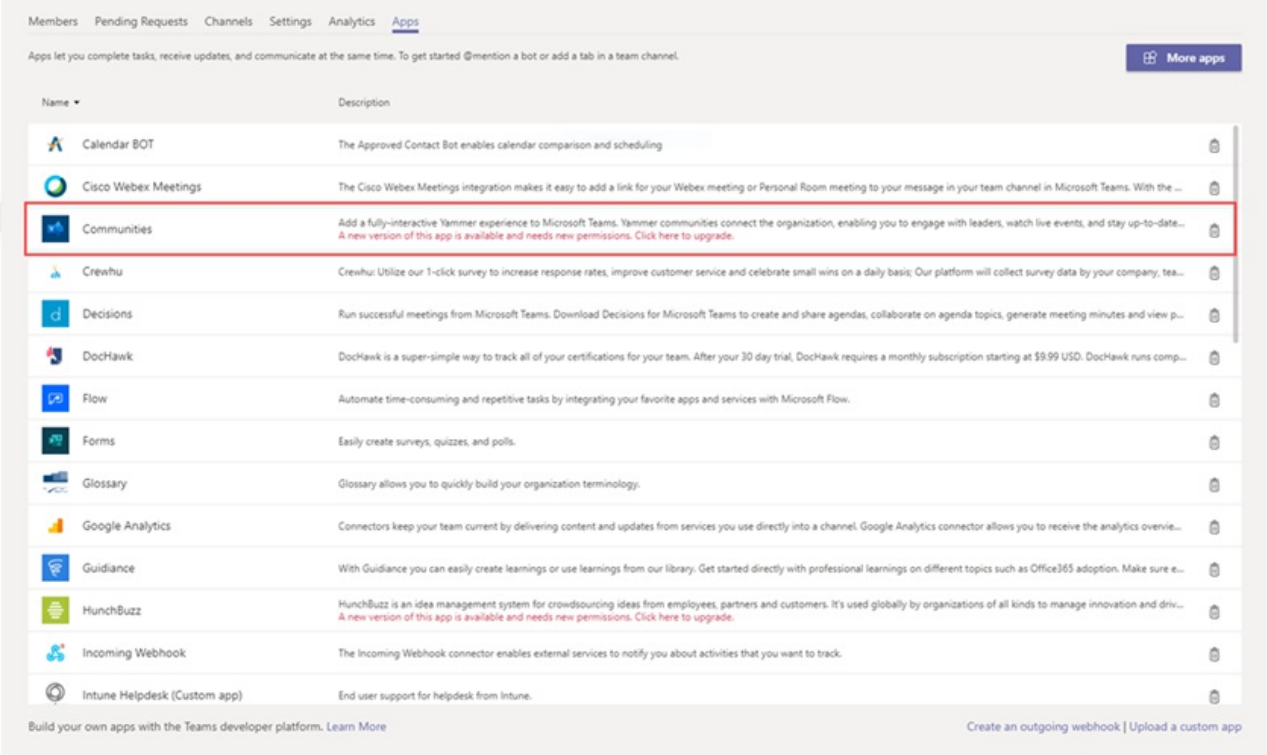
To update an app, developers should continue to follow the steps in the Develop and Validate sections.

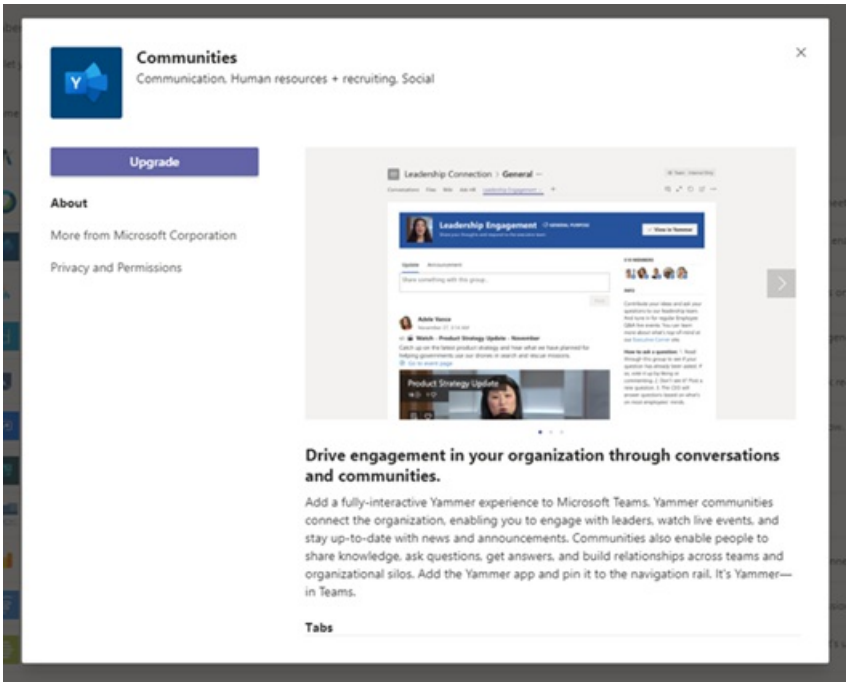
You can update the app on the Manage apps page in the Microsoft Teams admin center. To do this, in the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**. Click the app name, and then click **Update**. Doing this replaces the existing app, and all app permission policies and app setup policies remain enforced for the updated app.

End user update experience

In most cases, after you complete an app update the new version automatically appears for end users. However, there are some updates to the Microsoft Teams manifest that require user acceptance to complete:

- A bot was added or removed
- An existing bot's "botId" property changed
- An existing bot's "isNotificationOnly" property changed
- The bot's "supportsFiles" property changed
- A Messaging extension was added or removed
- A new connector was added
- A new static tab was added
- A new configurable tab was added
- Properties inside "webApplicationInfo" changed





Related topics

- Publish a custom app submitted through the Teams App Submission API
- Manage your apps in the Microsoft Teams admin center
- Manage custom app policies and settings in Teams
- Manage app permission policies in Teams
- Manage app setup policies in Teams

View app permissions and grant admin consent in the Microsoft Teams admin center

10/13/2020 • 4 minutes to read • Edit Online

The Manage apps page in the Microsoft Teams admin center is where you view and manage all Teams apps for your organization. For example, you can see the org-level status and properties of apps, approve or upload new custom apps to your organization's app store, block or allow apps at the org level, and manage org-wide app settings.

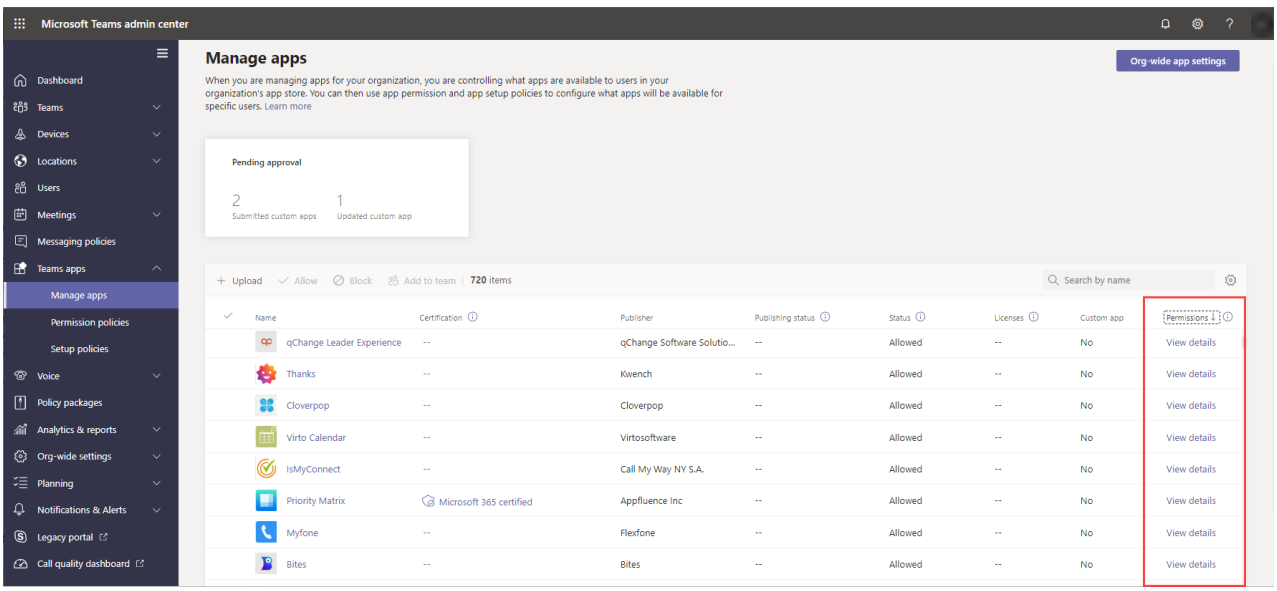
Here, you can also grant org-wide admin consent to apps that request permissions to access data and view resource-specific consent (RSC) permissions for apps.

Grant org-wide admin consent to an app

If you're a global admin, you can review and grant consent to apps that request permissions on behalf of all users in your organization. You do this so that users don't have to review and accept the permissions requested by the app when they start the app. Additionally, depending on the user's consent settings in Azure Active Directory (Azure AD), some users may not be allowed to grant consent to apps that access company data.

Examples of permissions requested by apps include the ability to read information stored in a team, read a user's profile, and send an email on behalf of users. To learn more, see Permissions and consent in the Microsoft identity platform endpoint.

The **Permissions** column indicates whether an app has permissions that need consent. You'll see a **View details** link for each app registered in Azure AD that has permissions that need consent. Keep in mind that this applies only to custom and third-party apps. You won't see this link or need to grant admin consent for apps published by Microsoft.

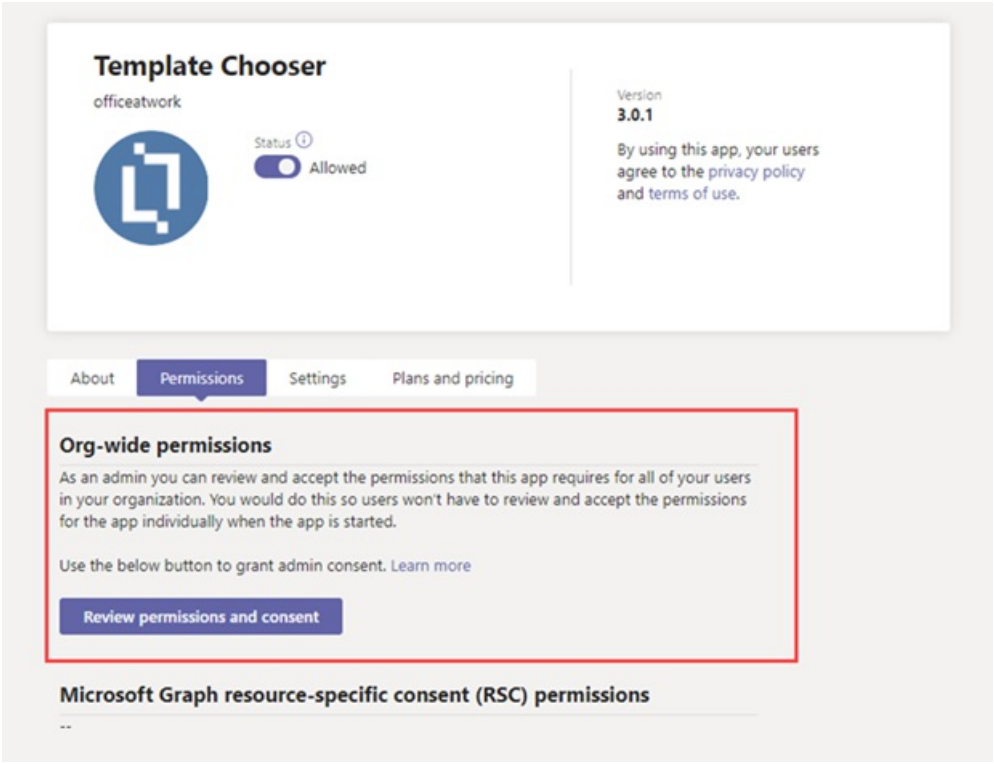


To grant org-wide consent to an app, follow these steps:

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. Do one of the following:
   - Search for the app you want, click the app name to go to the app details page, and then select the **Permissions** tab.

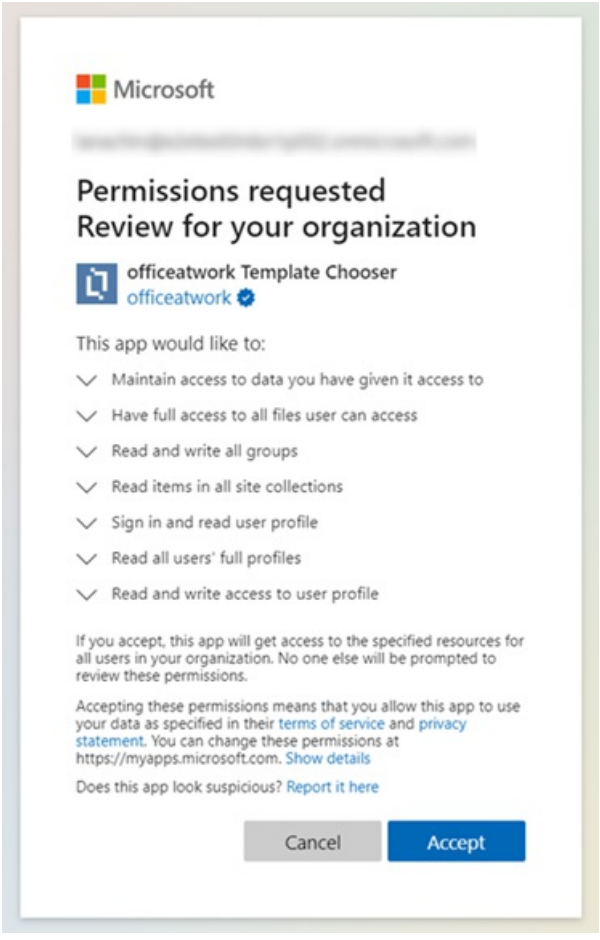
- Sort the **Permissions** column in descending order to find the app, and then select **View details**. Doing this takes you to the **Permissions** tab of the app details page.

3. Under **Org-wide permissions**, select **Review permissions and consent**.



You must be a global admin to do this. This option isn't available to Teams service admins.

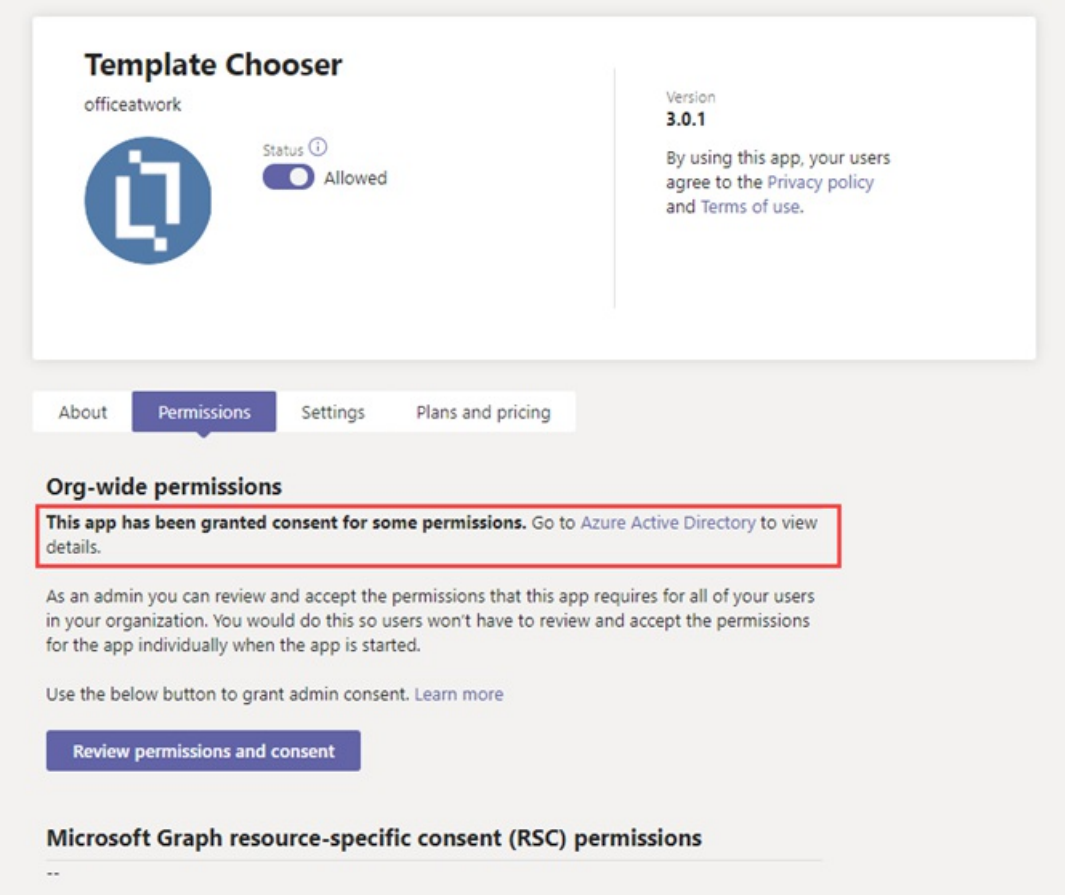
4. On the **Permissions** tab, review the permissions requested by the app.



> **IMPORTANT**
>
> Granting org-wide consent to an app allows the app to access your organization's data. Carefully review the permissions requested by the app before you grant consent.

5. If you agree with the permissions requested by the app, click **Accept** to grant consent. A banner temporarily appears at the top of the page to let you know that the requested permissions have been granted for the app. The app now has access to the specified resources for all users in your organization and no one else will be prompted to review the permissions.

After you accept the permissions, you'll see a message under **Org-wide permissions** on the app details page to let you know that consent was granted. To view details about the app's permissions, click the **Azure Active Directory** link to go to the app's page in the Azure AD portal.



If users in your organization are allowed to grant consent and if one or more users granted consent to a particular app, you'll also see the same message to let you know that consent was granted and the Azure Active Directory link to the app's page in the Azure AD portal.

> **NOTE**
>
> Although, the **Review permissions and consent** option isn't available to Teams service admins and they can't grant org-wide admin consent to apps, Teams service admins can view the content on the **Permissions** tab for an app. For example, a Teams service admin can click the **Azure Active Directory** link to view app permissions details in the Azure AD portal.

View resource-specific consent permissions of an app

RSC permissions let team owners grant consent for an app to access and modify a team's data. RSC permissions are granular, Teams-specific permissions that define what an app can do in a specific team. Examples of RSC permissions include the ability to create and delete channels, get the settings for a team, and create and remove

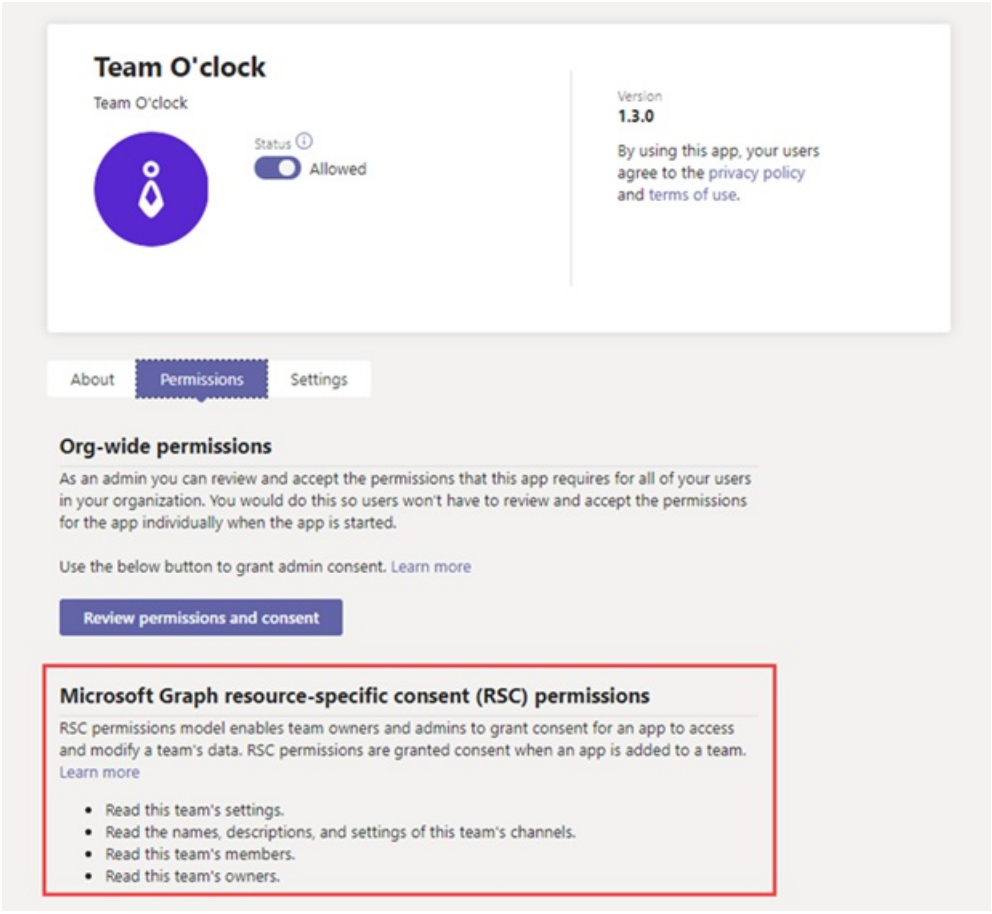
channel tabs.

RSC permissions are defined in the app manifest and not in Azure AD. You grant consent to RSC permissions when you add the app to a team. To learn more, see Resource-specific consent (RSC).

Global admins and Teams service admin can view RSC permissions for an app on the **Permissions** tab of the app details page.

To view RSC permissions for an app, follow these steps:

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**.
2. Search for the app you want, click the app name to go to the app details page, and then select the **Permissions** tab.
3. Under **Microsoft Graph resource-specific consent (RSC) permissions**, review the RSC permissions requested by the app.



Known issues

The "View details" link isn't displayed in the Permissions column for some third-party apps that request permissions

Currently, the ability to review permissions and grant consent isn't available for all third-party apps registered in Azure AD that request permissions. Instead of the **View details** link, you'll see -- in the **Permissions** column. We're working with ISVs to enable this feature for their apps.

Related topics

- Manage your apps in the Microsoft Teams admin center
- Permissions and consent in the Microsoft identity platform endpoint
- Resource-specific consent in Teams

- Resource-specific consent (RSC)
- Navigating the Teams app lifecycle (Ignite 2020 session)

Microsoft Teams apps permissions and considerations

11/2/2020 • 8 minutes to read • Edit Online

Microsoft Teams apps are a way to aggregate one or more capabilities into an *app package* that can be installed, upgraded, and uninstalled. The capabilities include:

- Bots
- Messaging extensions
- Tabs
- Connectors

Apps are consented to by users and managed by IT from a policy perspective. However, for the most part, an app's permissions and risk profile are defined by the permissions and risk profiles of the capabilities that the app contains. Therefore, this article focuses on permissions and considerations at the capability level.

The permissions listed below in capital letters, for example RECEIVE_MESSAGE and REPLYTO_MESSAGE, don't appear anywhere in the Microsoft Teams developer documentation or the permissions for Microsoft Graph. They're simply a descriptive shorthand for the purpose of this article.

TITLE	DESCRIPTION
Decision point	• Use the tables below as a guide to understand which permissions the apps you're investigating are requesting.
Next step	• Research the app or service itself to decide whether you want to allow access to it within your organization. For example, bots send and receive messages from users, and—except for enterprise custom bots—they're located outside the compliance boundary. Therefore, any app that includes a bot requires those permissions and has that risk profile, at a minimum.

Global app permissions and considerations

Required permissions

None

Optional permissions

None

Considerations

- An app must disclose what data it uses and what the data is used for in its terms of use and privacy policy links.
- Resource-specific consent provides a set of permissions that apps can request, which appears on the installation screen of the app. To learn more about resource-specific consent permissions, see Graph permissions reference.
- Apps may also need permissions other than resource-specific consent permissions. After an app is installed, the app may request Graph permissions through a consent prompt. To learn more, see Understanding Azure

AD application consent experiences. You can configure API permissions and consent in the Azure portal. To learn more, see Azure Active Directory consent framework.

Bots and messaging extensions

Required permissions

- RECEIVE_MESSAGE, REPLYTO_MESSAGE. The bot can receive messages from users and reply to them.[1]
- POST_MESSAGE_USER. After a user has sent a message to a bot, the bot can send the user direct messages (also called *proactive messages* at any time.
- GET_CHANNEL_LIST. Bots added to teams can get a list of names and IDs of the channels in a team.

Optional permissions

- IDENTITY. When it's used in a channel, the app's bots can access basic identity information of team members (first name, last name, user principal name [UPN], email address); when it's used in a personal or group chat, the bot can access the same information for those users.
- POST_MESSAGE_TEAM. Allows an app's bots to send direct (proactive) messages to any team member at any time, even if the user has never talked to the bot before.
- The following are not explicit permissions, but are implied by RECEIVE_MESSAGE and REPLYTO_MESSAGE and the scopes into which the bots can be used, declared in the manifest:
  - RECEIVE_MESSAGE_PERSONAL, REPLYTO_MESSAGE_PERSONAL
  - RECEIVE_MESSAGE_GROUPCHAT, REPLYTO_MESSAGE_GROUPCHAT
  - RECEIVE_MESSAGE_TEAM, REPLYTO_MESSAGE_TEAM
- SEND_FILES, RECEIVE_FILES.[2] Controls whether a bot can send and receive files in personal chat (not yet supported for group chat or channels).

Considerations

- Bots only have access to teams to which they've been added or to users who have installed them.
- Bots only receive messages in which they're explicitly mentioned by users. This data leaves the corporate network.
- Bots can only reply to conversations in which they're mentioned.
- After a user has conversed with a bot, if the bot stores that user's ID, it can send that user direct messages at any time.
- It is theoretically possible for bot messages to contain links to phishing or malware sites, but bots can be blocked by the user, the tenant admin, or globally by Microsoft.
- A bot can retrieve (and might store) very basic identity information for the team members the app has been added to, or for individual users in personal or group chats. To get further information about these users, the bot must require them to sign in to Azure Active Directory (Azure AD).
- Bots can retrieve (and might store) the list of channels in a team; this data leaves the corporate network.
- When a file is sent to a bot, the file leaves the corporate network. Sending and receiving files requires user approval for each file.
- By default, bots don't have the ability to act on behalf of the user, but bots can ask users to sign in; as soon as the user signs in, the bot will have an access token with which it can do additional things. Exactly what those additional things are depends on the bot and where the user signs in: a bot is an Azure AD app registered at https://apps.dev.microsoft.com/ and can have its own set of permissions.

- Bots are informed whenever users are added to or deleted from a team.
- Bots don't see users' IP addresses or other referrer information. All information comes from Microsoft. (There is one exception: if a bot implements its own sign-in experience, the sign-in UI will see users' IP addresses and referrer information.)
- Messaging extensions, on the other hand, do see users' IP addresses and referrer information.
- App guidelines (and our AppSource review process) require discretion in posting personal chat messages to users (via the POST_MESSAGE_TEAM permission) for valid purposes. In the event of abuse, users can block the bot, tenant admins can block the app, and Microsoft can block bots centrally if necessary.

[1] Some bots only send messages (POST_MESSAGE_USER). They're called "notification-only" bots, but the term doesn't refer to what a bot is allowed or not allowed to do, it means that the bot doesn't want to expose a conversational experience. Teams uses this field to disable functionality in the UI that would ordinarily be enabled; the bot isn't restricted in what it's allowed to do compared to bots that do expose a conversational experience.

[2] Governed by the supportsFiles Boolean property on the bot object in the manifest.json file for the app.

> **NOTE**
>
> If a bot has its own sign-in, there's a second—different—consent experience the first time the user signs in.
>
> Currently, the Azure AD permissions associated with any of the capabilities inside a Teams app (bot, tab, connector, or messaging extension) are completely separate from the Teams permissions listed here.

Tabs

A tab is a website running inside Teams.

Required permissions

SEND_AND_RECEIVE_WEB_DATA

Optional permissions

None (currently)

Considerations

- The risk profile for a tab is almost identical to that same website running in a browser tab.
- A tab also gets the context in which it's running, including the sign-in name and UPN of the current user, the Azure AD Object ID for the current user, the ID of the Microsoft 365 Group in which it resides (if it's a team), the tenant ID, and the current locale of the user. However, to map these IDs to a user's information, the tab would have to make the user sign in to Azure AD.

Connectors

A connector posts messages to a channel when events in an external system occur.

Required permissions

POST_MESSAGE_CHANNEL

Optional permissions

REPLYTO_CONNECTOR_MESSAGE. Certain connectors support actionable messages, which allow users to post targeted replies to the connector message, for example by adding a response to a GitHub issue or adding a date to a Trello card.

Considerations

- The system that posts connector messages doesn't know who it's posting to or who receives the messages: no information about the recipient is disclosed. (Microsoft is the actual recipient, not the tenant; Microsoft does the actual post to the channel.)
- No data leaves the corporate network when connector messages are posted to a channel.
- Connectors that support actionable messages (REPLYTO_CONNECTOR_MESSAGE permission) also don't see IP address and referrer information; this information is sent to Microsoft and then routed to HTTP endpoints that were previously registered with Microsoft in the Connectors portal.
- Each time a connector is configured for a channel, a unique URL for that connector instance is created. If that connector instance is deleted, the URL can no longer be used.
- Connector messages can't contain file attachments.
- The connector instance URL should be treated as secret/confidential: anyone who has that URL can post to it, like an email address. Therefore, there's some risk of spam or links to phishing or malware sites. If that were to happen, team owners can delete the connector instance.
- If the service that sends connector messages were to become compromised and start sending spam/phishing/malware links, a tenant administrator can prevent new connector instances from being created and Microsoft can block them centrally.

> **NOTE**
>
> It's not currently possible to know which connectors support actionable messages (REPLYTO_CONNECTOR_MESSAGE permission).

Outgoing webhooks

Outgoing webhooks are created on the fly by team owners or team members. They aren't capabilities of Teams apps; this information is included for completeness.

Required permissions

RECEIVE_MESSAGE, REPLYTO_MESSAGE. Can receive messages from users and reply to them.

Optional permissions

None

Considerations

- Outgoing webhooks are similar to bots but have fewer privileges. They must be explicitly mentioned, just like bots.
- When an outgoing webhook is registered, a secret is generated, which allows the outgoing webhook to verify that the sender is Microsoft Teams as opposed to a malicious attacker. This secret should remain a secret; anyone who has access to it can impersonate Microsoft Teams. If the secret is compromised, the outgoing webhook can be deleted and re-created, and a new secret will be generated.
- Although it's possible to create an outgoing webhook that doesn't validate the secret, we recommend against it.
- Other than receiving and replying to messages, outgoing webhooks can't do much: they can't proactively send messages, they can't send or receive files, they can't do anything else that bots can do except receive and reply to messages.

Purchase services for Teams third-party apps in the Microsoft Teams admin center

8/19/2020 • 2 minutes to read • Edit Online

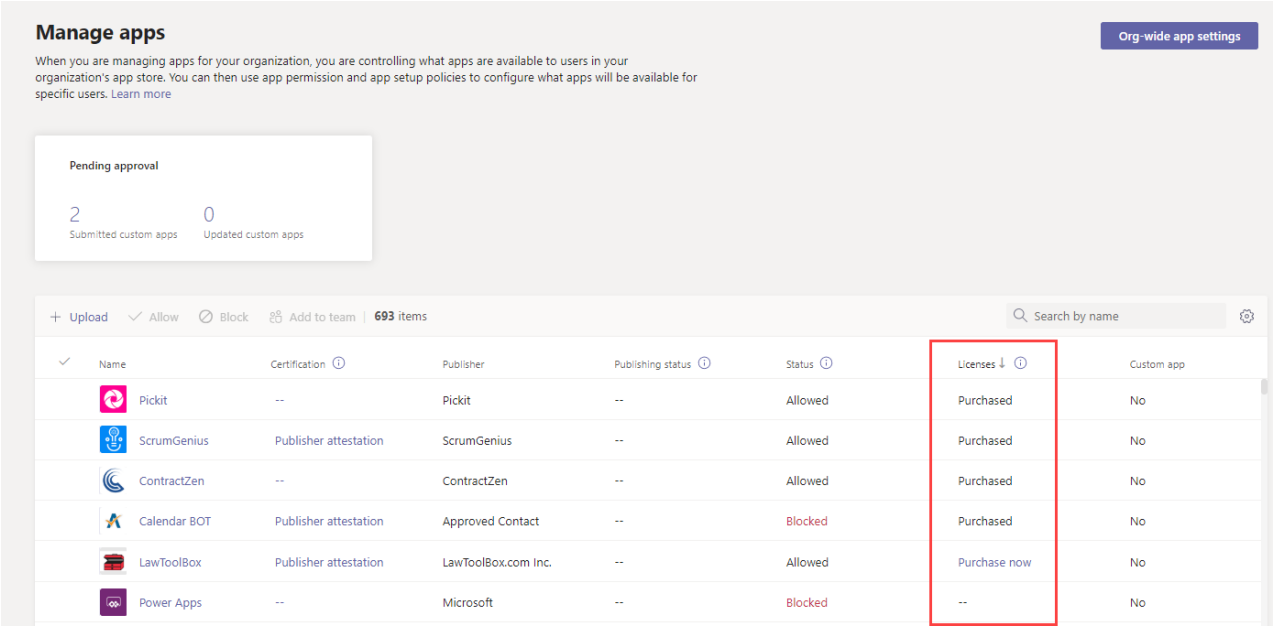
NOTE

This feature is currently only available in the United States.

Teams apps are free to install and some may require purchasing service subscriptions to experience the app's full functionality and scope. These service subscriptions are called Software as a Service (SaaS) offers, which are available for purchase through AppSource and now through the Microsoft Teams admin center.

The Manage apps page in the Microsoft Teams admin center is where you view and manage all Teams apps for your organization. For example, you can see the org-level status and properties of apps, upload new custom apps to your organization's app store, block or allow apps at the org level, and manage org-wide app settings.

Here, you can also purchase licenses for services offered by third-party apps for users in your organization. The **Licenses** column in the table indicates whether an app offers a SaaS subscription for purchase.



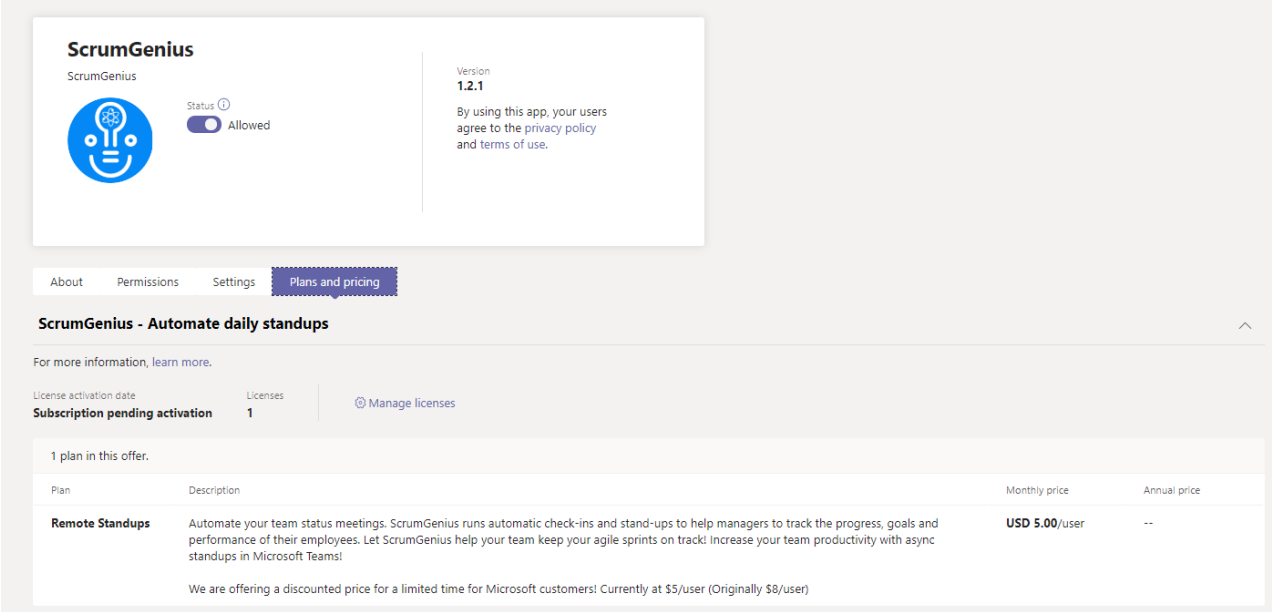
Search for and purchase services for a third-party app

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps**. You must be a global admin or Teams service admin to access the page.
2. Search for the app that you want. To identify apps that have a paid SaaS subscription, look in the **Licenses** column. Each app will have one of the following values:
   - **Purchase now**: The app offers a SaaS subscription and is available to purchase.
   - **Purchased**: The app offers a SaaS subscription and you've purchased licenses for it.
   - **- -**: The app doesn't offer a SaaS subscription.
3. When you find the app, click **Purchase now** to go to the **Plans and pricing** tab of the app details page. Review the plans and pricing information for the SaaS offer for the app. If you need more information, click the **learn more** link to go to the app's page on AppSource.

4. To buy a plan, click **Purchase now**. You'll be redirected to the purchase experience for the offer associated with the Teams app. This is where you'll complete your purchase of the service or SaaS offer.
5. Choose the plan that you want. If the SaaS offer includes more than one plan, click **Change** to see the list of available plans.
6. Select your billing term (either **Monthly** or **Yearly**), and then enter the number of user licenses that you want to buy.
7. Enter your payment method.
8. When you're ready, select **Place order**.
9. Click **Configure now** to activate your subscription on the publisher's website.

After you've purchased the SaaS offer associated with the Teams app, you can view the following purchase details on the **Plans and pricing** tab of the app details page.

- **License activation date**: Date on which your license was activated. If your account isn't yet set up, this shows as **Subscription pending activation**.
- **Licenses**: Number of licenses you purchased.



Select **Manage licenses** to go to the Microsoft 365 admin center to view and manage the licenses you purchased and to manage license assignments for users.

Global admins can view the purchases made by anyone in the organization whereas Teams service admins can only view the purchases made by themselves.

Have a SaaS offer for a Teams app that you want to list and sell in the Microsoft Teams admin center and AppSource?

Developers can create SaaS offers associated with their Teams apps. These offers are published through Partner Center and are available for organizations to purchase through AppSource and the Microsoft Teams admin center.

Third-party app developers can go to Create a SaaS offer for more information.

Related topics

- Manage your apps in the Microsoft Teams admin center
- Create a SaaS offer

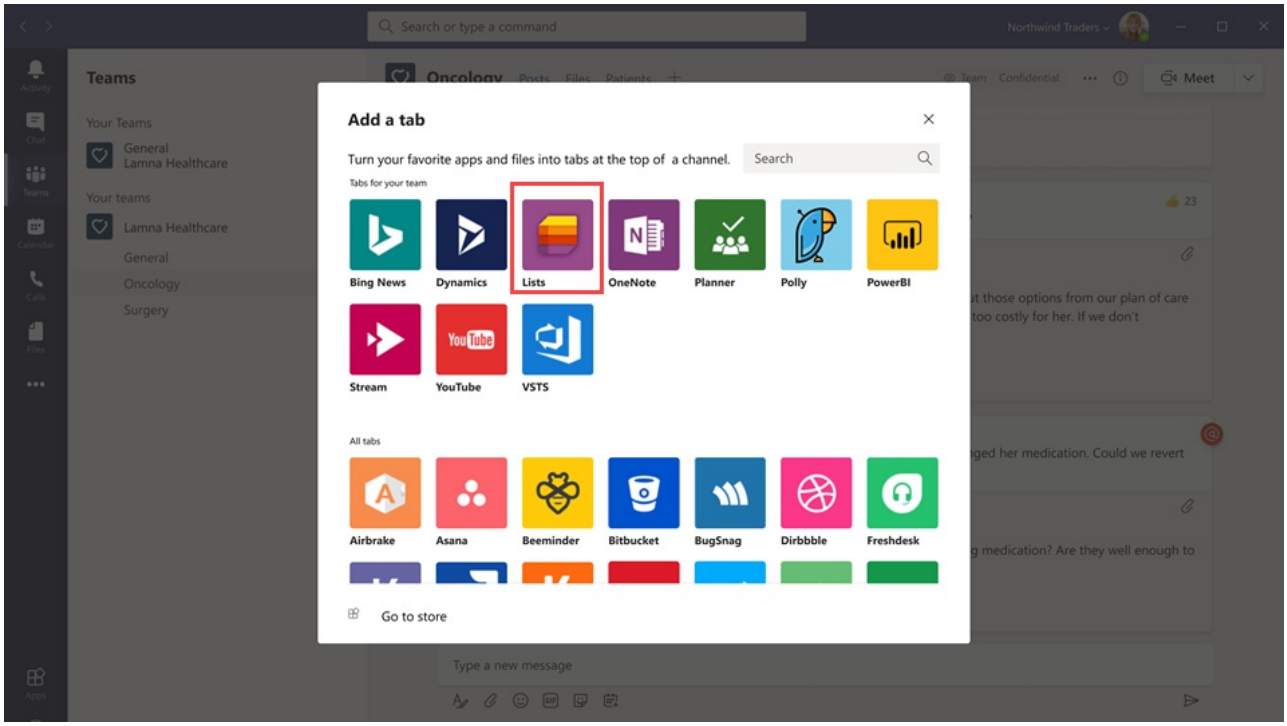
Manage the Lists app for your organization in Microsoft Teams

11/2/2020 • 6 minutes to read • Edit Online

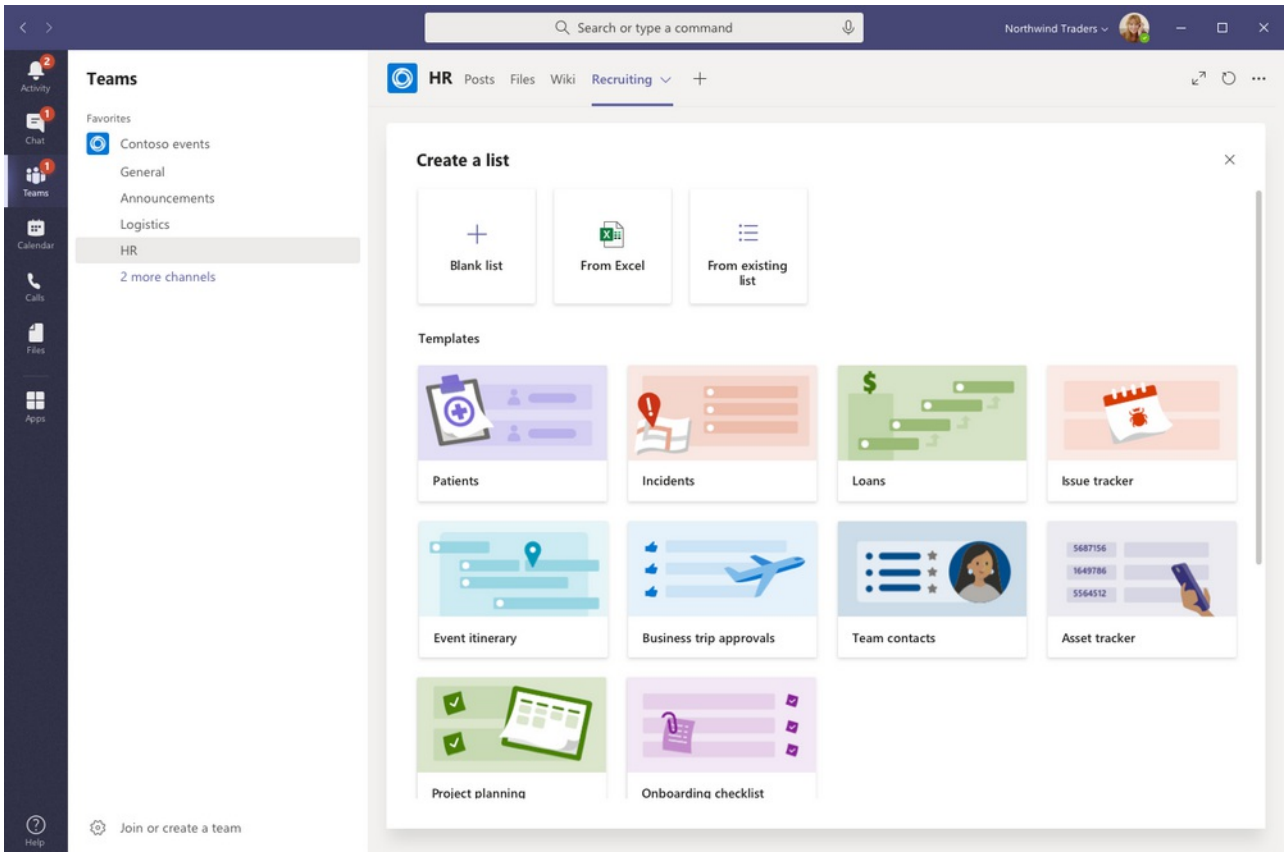
Overview of Lists

The Lists app in Microsoft Teams helps users in your organization track information, organize work, and manage workflows. With Lists, users can track data such as issues, assets, routines, contacts, inventory, incidents, loans, patients, and more using customizable views, rules, and alerts to keep everyone on the team in sync.

In Teams, users access Lists as a tab in a channel. Click + to open the tab gallery and add a new Lists app tab instance to a channel to get started.



Users can create new lists or pin existing lists from within the same team or from a different SharePoint site that they have access to. New lists can be created from scratch, from built-in templates, based on the structure of an existing list, or by importing data from an Excel workbook. The Lists app is available in Teams desktop, web, and mobile clients.



Templates

Templates in Lists are tailored to common information tracking scenarios for users. Each template comes with a predefined list structure, form layouts, and formatting options at both a list view and a details view level to help users get started quickly. After selecting a template, users get a preview of what the list will look like, along with some sample data. Here's some examples of how teams in your organization can use the predefined templates in Lists:

- Track issues and bring them to closure using the Issue tracker template.
- Organize all your event details with the Event itinerary template.
- Use the Patients template to record the needs and status of patients for health teams in your healthcare organization to monitor and coordinate care.
- Track the status of loan applications with the Loans template.

Example scenario

A local post office is responsible for sorting and delivering mail in their district. Each morning, the post office has a team huddle to review daily goals, share announcements, and discuss known incidents.

After the huddle, mail carriers pick up their mail and start their delivery route. Incidents can occur along a route, for example, a vehicle accident, dog-related issue, or social unrest protest. When mail carriers encounter an incident, they use Teams on their mobile devices to record the incident details, which are tracked in a list in the team channel. Everyone on the team, including mail carriers in the field, can see this information and stay informed.

Before moving to Teams, mail carriers had to go back to the post office to complete a hard-copy form to report an incident which was entered in an Excel spreadsheet. Teams gives mail carriers a mobile first, experience where they can use Lists to report incidents in the field as they happen, share incident details with team members, have conversations about them on the channel, and drive incidents to resolution.

What you need to know about Lists

Lists is available in every team and channel

Lists is pre-installed for all Teams users and is available directly in the tab gallery of every team and channel. This means that users don't have to go to the Teams app store to install it.

Lists and SharePoint

Lists data is stored in the SharePoint Online team site. To learn more about how SharePoint Online interacts with Teams, see How SharePoint Online and OneDrive for Business interact with Teams.

Permissions set in SharePoint apply to lists created in the Lists app. By default, lists inherit permissions from the site to which they belong. These permissions govern the types of actions that users can do, such as whether they can create or edit lists. To learn more, see Permission levels in SharePoint and User permissions and permission levels in SharePoint Server.

In certain scenarios, you may want restrict what actions users can do in lists. For example, a person on a team edits a list view, which changes it for all team members, and you want to allow only the team owner or certain team members to edit list views. To learn more, see Customize permissions for a SharePoint list or library.

> **NOTE**
> At this point, owner and member permissions in a team aren't linked in any way to permissions in the team site that govern the behavior of lists or the Lists App. However, based on customer feedback and usage, this will be considered for a future iteration of the product.

Limitations

With Lists, users get a desktop, web, and mobile experience. It's important to know that users can't create new lists or pin existing lists using Lists on the Teams mobile client. To view or edit a list on the Teams mobile client, a list must first be created or added using Lists on the Teams desktop or web client.

Guests can't create or delete a list. They can add list items to existing lists, start new conversations about list items, and reply to existing conversations about list items.

Lists and the SharePoint app

If users in your organization created lists using the SharePoint app, those lists will be automatically moved to Lists without any action needed from the user. To get the best and richest lists integration experience in Teams, use the Lists app and pin your existing lists.

Set up Lists

Enable or disable Lists in your organization

Lists is enabled by default for all Teams users in your organization. You can turn off or turn on the app at the org level on the Manage apps page in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps** .
2. Do one of the following:
   - To turn off Lists for your organization, search for the Lists app, select it, and then click **Block**.
   - To turn on Lists for your organization, search for the Lists app, select it, and then click **Allow**.

Enable or disable Lists for specific users in your organization

To allow or block specific users in your organization from using Lists, make sure Lists is turned on for your organization on the Manage apps page, and then create a custom app permission policy and assign it to those users. To learn more, see Manage app permission policies in Teams.

Search the audit log for list events

Lists are enabled with enterprise-level auditing so you can search for lists and list item events in the audit log in the Security & Compliance Center. To learn more, see Search the audit log in the Security & Compliance Center.

For a list of audit events that are relevant to the Lists app in Teams, see SharePoint list activities.

Before you can search the audit log, you have to first turn on auditing in the Security & Compliance Center. Keep in mind that audit data is only available from the point at which you turned on auditing.

Power Automate, Power Apps, and Graph API

Lists supports Power Automate for workflows and Power Apps for list forms. Developers can use the Lists API to connect list data as a source through Microsoft Graph.

Give feedback or report an issue

To send us feedback or report an issue, click **Help** near the bottom of the left navigation in Teams, and then select **Report a problem**. Select **Lists**, and then enter your feedback or details about the issue you're experiencing.

Related topics

- Lists help documentation

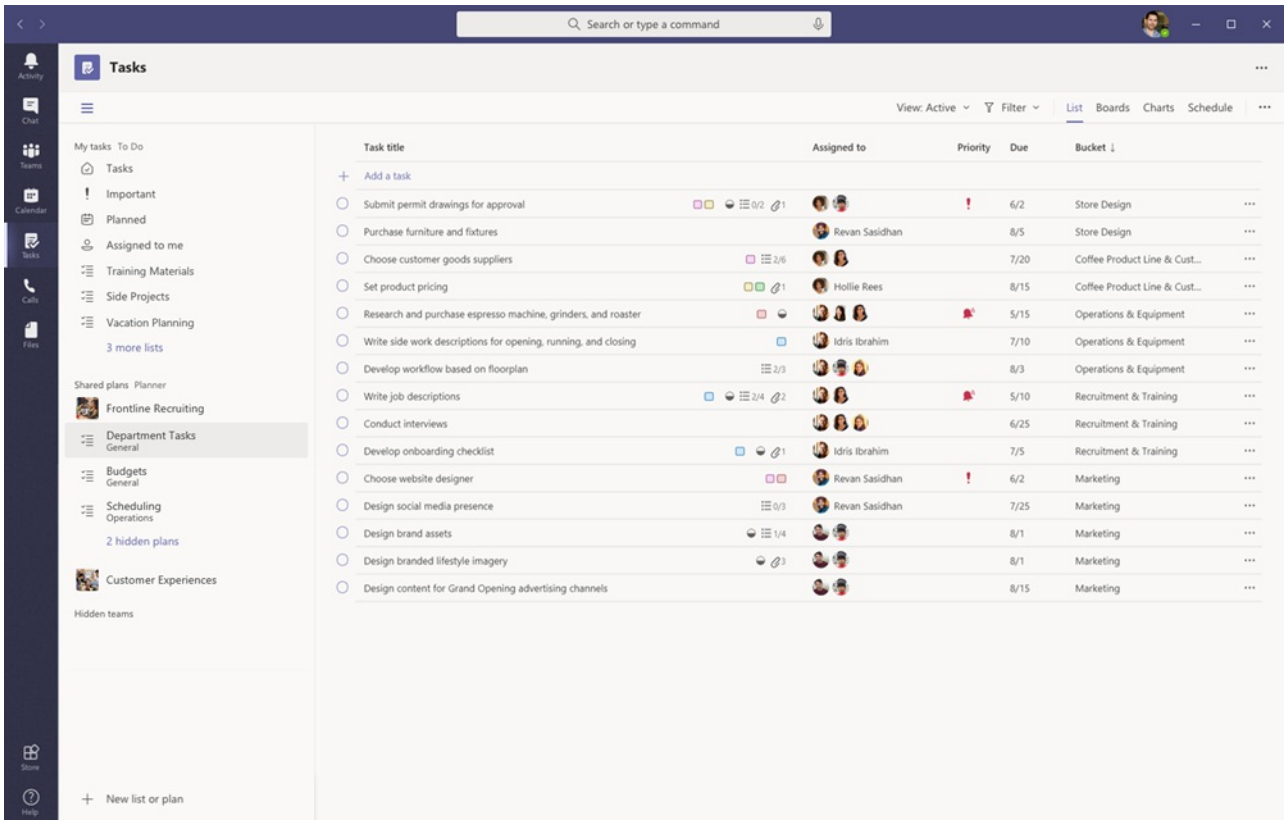
Manage the Tasks app for your organization in Microsoft Teams

12/5/2020 • 8 minutes to read • Edit Online

Overview of Tasks

The Tasks app brings a cohesive task management experience to Microsoft Teams, integrating individual tasks powered by Microsoft To Do and team tasks powered by Planner in one place. Users can access Tasks as an app on the left side of Teams and as a tab in a channel within individual teams. **My tasks** and **Shared plans** in Tasks let users view and manage all their individual and team tasks and prioritize their work. Tasks is available in Teams desktop, web, and mobile clients.

> **NOTE**
>
> As we roll out the Tasks experience on Teams desktop clients, the app name will initially appear as **Planner** to users. The name will then temporarily change to **Tasks by Planner and To Do**, and later on, it will be renamed to **Tasks**. On Teams mobile clients, users will always see the app name as **Tasks**. There may be a short delay in the availability of the mobile experience after the desktop experience is available.



For organizations who want to streamline task management for Firstline Workers, Tasks also includes capabilities that enable you to target, publish, and track tasks at scale across your Firstline Workforce. For example, corporate and regional leadership can create and publish task lists targeted to relevant locations, such as specific retail stores, and track progress through real-time reports. Managers can assign tasks to their staff and direct activities within their locations, and Firstline Workers have a prioritized list of their assigned tasks on mobile or desktop. To enable task publishing, you'll first need to set up a team targeting hierarchy for your organization, which defines how all teams in the hierarchy are related to each other.

What you need to know about Tasks

Tasks is available as an app and as a tab in a channel. Keep in mind that the app comprises both individual tasks from To Do and team tasks from Planner whereas the tab shows only team tasks.

With Tasks, users get a desktop, web, and mobile experience. If Tasks is installed on the Teams desktop client, users will also see it on their Teams web and mobile clients. The exception is guest users. It's important to know that guests can only access Tasks as an app from the Teams mobile client. Guests will see Tasks tabs on both Teams desktop and web clients.

My tasks shows a user's individual tasks. **Shared plans** show tasks that the whole team is working on and includes any task list that's added as a Tasks tab to a channel. Note the following:

- Task lists that a user creates in the Tasks app will also appear in To Do clients for that user. Similarly, task lists that a user creates in To Do will appear in **My tasks** in Tasks for that user. The same is true for individual tasks.
- Any Tasks tab that's added to a channel will also appear in Planner clients. When a user creates a plan in Planner, the plan won't show in the Tasks or Planner app unless it's added as a tab to a channel. When a user adds a new Tasks tab, they can create a new list or plan or choose an existing one.

Set up Tasks

> **IMPORTANT**
> Settings and policies that you configured for Planner will also apply to Tasks.

Enable or disable Tasks in your organization

Tasks is enabled by default for all Teams users in your organization. You can turn off or turn on the app at the org level on the Manage apps page in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps** .
2. In the list of apps, do one of the following:
   - To turn off Tasks for your organization, search for the Tasks app, select it, and then click **Block**.
   - To turn on Tasks for your organization, search for the Tasks app, select it, and then click **Allow**.

> **NOTE**
> If you can't find the Tasks app, search for the names in the first note of this article. The app could still be in the process of being renamed.

Enable or disable Tasks for specific users in your organization

To allow or block specific users in your organization from using Tasks, make sure Tasks is turned on for your organization on the Manage apps page, and then create a custom app permission policy and assign it to those users. To learn more, see Manage app permission policies in Teams.

Use an app setup policy to pin Tasks to Teams

App setup policies let you customize Teams to highlight the apps that are most important for users in your organization. The apps you set in a policy are pinned to the app bar—the bar on the side of the Teams desktop client and at the bottom of the Teams mobile clients—where users can quickly and easily access them.

To pin the Tasks app for your users, you can edit the global (Org-wide default) policy or create and assign a custom app setup policy. To learn more, see Manage app setup policies in Teams.

A user's My tasks is visible if the user is licensed for Exchange Online

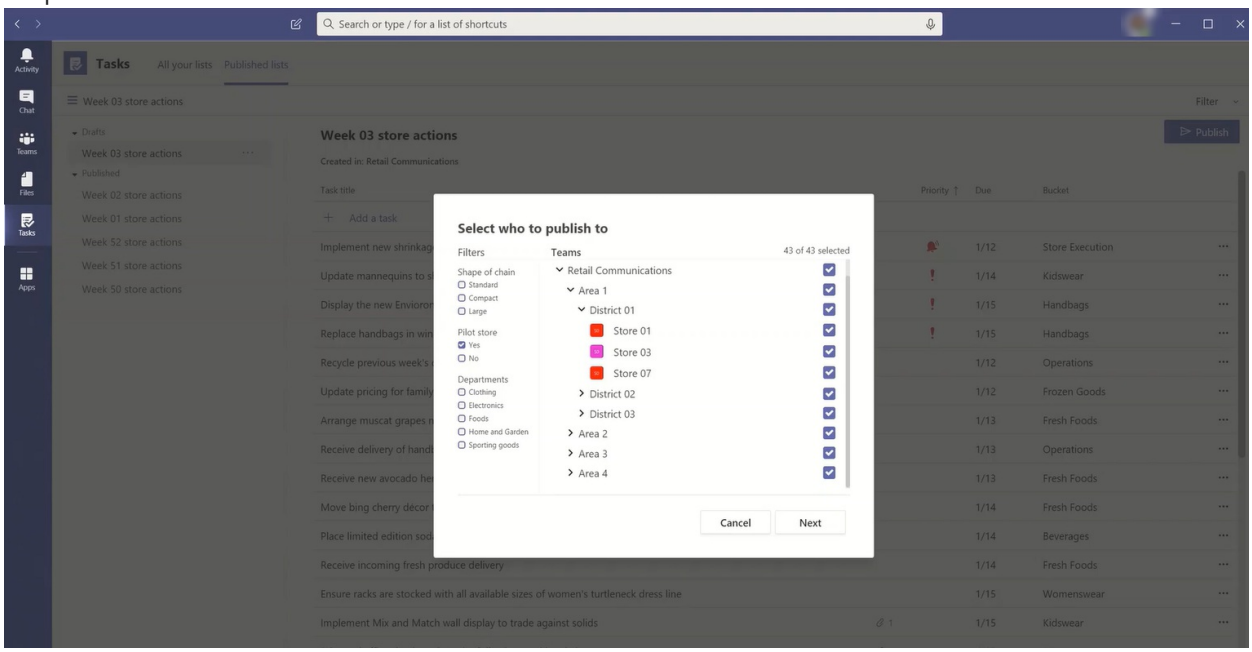
If you don't want a user to see **My tasks**, you can hide it. To do this, remove the user's Exchange Online license. It's important to know that after you remove an Exchange Online license, the user no longer has access to their mailbox. Mailbox data is held for 30 days, after which the data will be removed and can't be recovered unless the mailbox is placed on In-Place Hold or Litigation Hold.

We don't recommend this for information workers, but there may be some scenarios where this could apply, such as for Firstline Workers who don't depend on email.

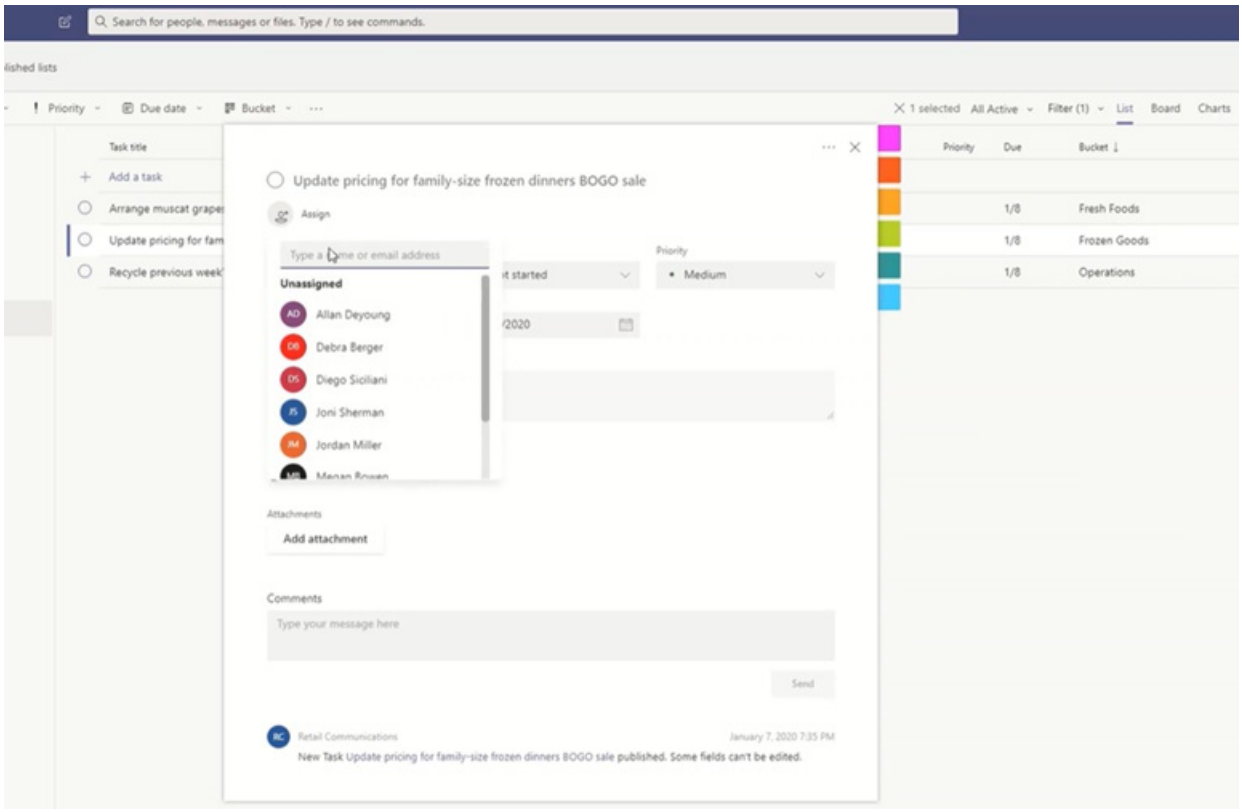
Task publishing

With task publishing, your organization can publish task lists targeted to specific locations (teams) across your organization to define and share a work plan to be completed at those locations.

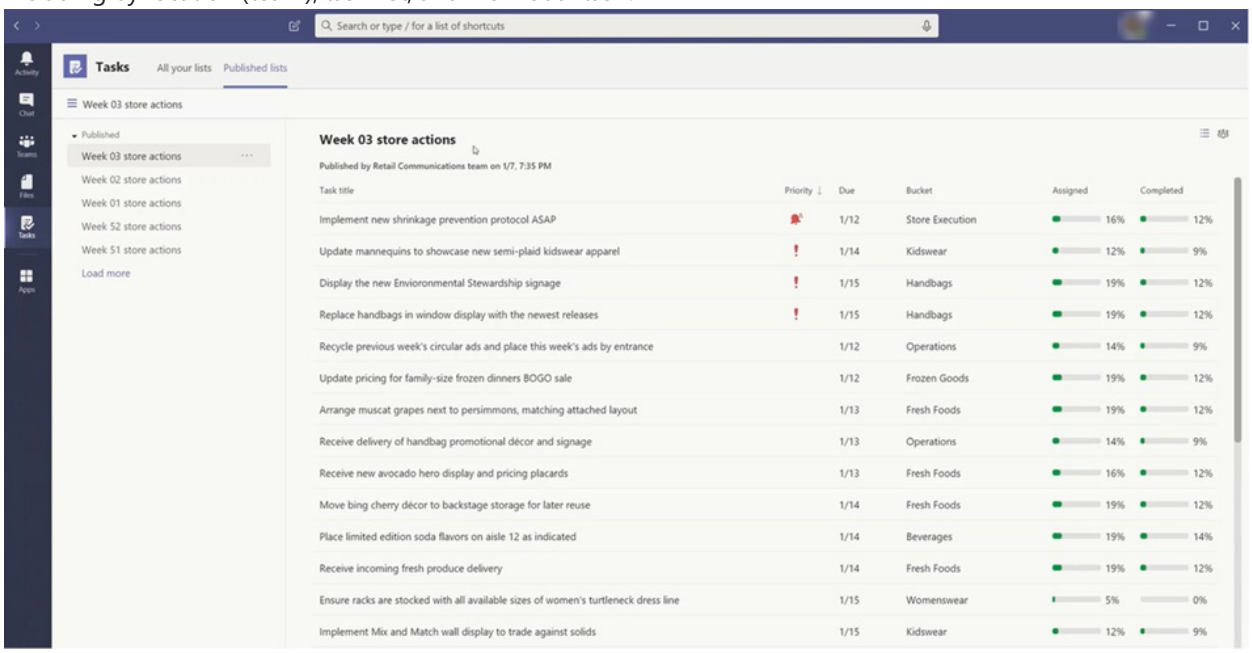
- People on the publishing team, such as corporate or regional leadership, can create task lists and publish them to specific teams.



- Managers on the recipient teams can review the published task lists and assign individual tasks to team members.



- Firstline Workers have a simple mobile experience to see tasks assigned to them. They can attach photos to show their work when appropriate and mark their tasks as completed.
- Publishers and managers can view reports to see assignment and completion status of tasks at each level, including by location (team), task list, and individual task.



Users create, manage, and publish task lists on the **Published lists** tab in the Tasks app. This tab only shows for a user if your organization set up a team targeting hierarchy and the user is on a team that's included in the hierarchy. The hierarchy determines whether the user can publish or receive task lists and view reporting for received lists.

Example scenario

Here's an example of how task publishing works.

Contoso is rolling out a new food takeout and delivery promotion. To maintain a consistent brand experience, they need to coordinate consistent execution of the rollout across over 300 store locations.

The Marketing team shares the promotion details and the corresponding list of tasks with the Retail Communications Manager. The Retail Communications Manager, who serves as the gatekeeper for stores, reviews

the information, creates a task list for the promotion, and then creates a task for each unit of work that needs to be performed by each of the affected stores. When the task list is complete, she needs to select the stores that must complete the work. In this case, the promotion only applies to stores in the United States that have an in-store restaurant. In Tasks, she filters the store list based on the in-store restaurant attribute, selects the matching United States locations in the hierarchy, and then publishes the task list to those stores.

Store managers at each location receive a copy of the published tasks and assign those tasks to their team members. Managers can use the Tasks experience to understand all the work required across their store. They can also use the available filters to focus on a specific set of work, such as work due today or work in a particular area.

Firstline Workers at each store location now have a prioritized list of their work in Tasks on their mobile device. When they finish a task, they mark it complete. Some may even choose to upload and attach a photo to the task to show their work.

Contoso headquarters and intermediate managers can view reporting to see the assignment and completion status of tasks at each store and across stores. They can also drill down to a specific task to see the status within different stores. As the launch date gets closer, they can spot any abnormalities and check in with their teams as needed. This visibility allows Contoso to improve the efficiency of the rollout and provide a more consistent experience across their stores.

Set up your team targeting hierarchy

To enable task publishing in your organization, you have to first set up your team targeting schema in a .CSV file. The schema defines how all the teams in your hierarchy are related to each other and the attributes used to filter and select teams. After you create the schema, upload it to Teams to apply it to your organization. Members of the publishing team, such as the Retail Communications Manager in the example scenario, can then filter teams by hierarchy, attributes, or a combination of both to select the relevant teams that should receive the task lists, and then publish the task lists to those teams.

For steps on how to set up your team targeting hierarchy, see Set up your team targeting hierarchy.

Power Automate and Graph API

Tasks supports Power Automate for To Do and Graph APIs for Planner. To learn more, see:

- Planner tasks and plans API overview
- Using Microsoft To Do with Power Automate

Set up your team targeting hierarchy

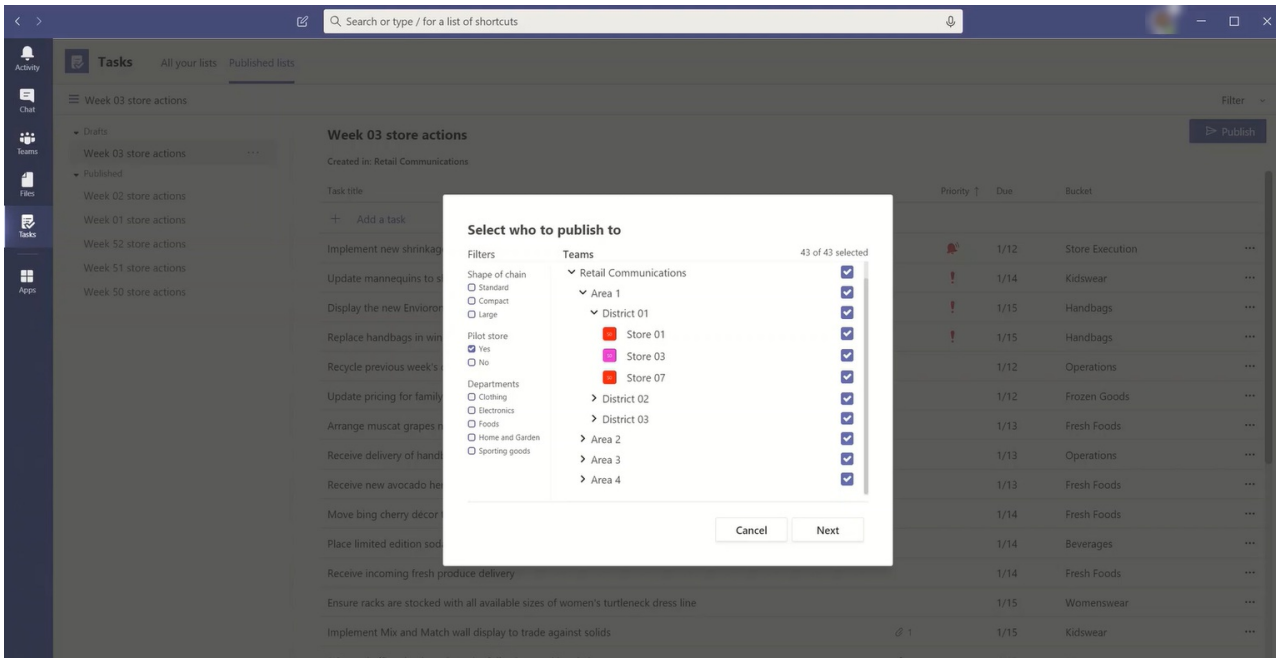
11/2/2020 • 11 minutes to read • Edit Online

This feature is currently in private preview.

To create a hierarchy of teams that can be used by your organization to publish content to a large set of teams, you need to set up your team targeting schema. The schema defines how all the teams in your hierarchy are related to each other and the attributes that can be used to filter your teams. After you create the schema, you upload it to Teams and the hierarchy is applied throughout your organization. After the schema is uploaded, apps within the Teams client can use it.

> **IMPORTANT**
>
> You won't see a hierarchy of teams when you're browsing teams or channels within them. To see the hierarchy of teams, you need to use an app that supports it. For the initial release, only the Tasks app supports hierarchical teams. The remainder of this article discusses setting up a team hierarchy in the context of publishing tasks to recipient teams. Before you set up your team targeting hierarchy, see Manage the Tasks app for your organization in Teams for an overview of task publishing.

Here's an example of how the hierarchy is represented in the Tasks app in Teams. After a task list is created, members of the publishing team can then select the recipient teams to send (publish) the task list to. When selecting teams, the publishing team can filter by hierarchy, by attributes, or a combination of both.

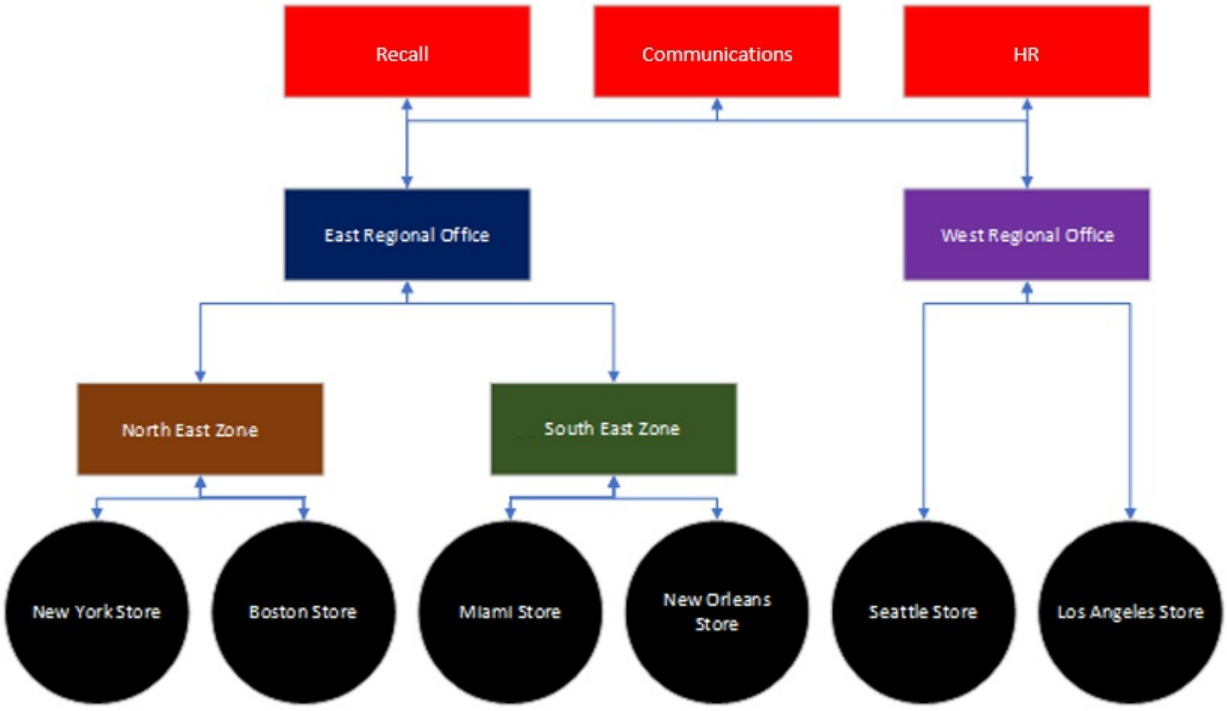


Plan your hierarchy

Before you create the schema that defines your hierarchy, you need to do some planning and decide how you want to shape your organization. This includes deciding which organizational groups need to publish tasks to other groups. Each node in the hierarchy represents a working group or group of groups. Nodes at the bottom of the hierarchy (those without children) are teams that can receive tasks while other nodes (parents) are organizational groups with permission to publish tasks downward. A team can only be represented one time in the hierarchy.

For example, in the following hierarchy, Recall, Retail Communications, and HR, can publish tasks to every bottom node (team) in the hierarchy, whereas North East Zone can only publish tasks to the New York Store and Boston

Store teams. This hierarchy allows the Recall, Retail Communications, and HR groups to publish tasks that apply to the entire company, such as benefits information or messages from the CEO. North East Zone can publish tasks, such as personnel scheduling, weather information, and so on, only to the New York Store and Boston Store teams.



Create your hierarchy

The schema that defines your hierarchy is based on a comma-separated values (CSV) file. Each row in the CSV file corresponds to one node within the hierarchy of teams. Each row contains information that names the node within the hierarchy, optionally links it to a team, and includes attributes that can be used to filter teams in apps that support it.

You can also define buckets, which are categories that the publishing team can use to organize content sent to recipient teams to make it easier for them to view, sort, and focus on relevant content.

Add required columns

The CSV file must contain the following three columns, in the following order, starting at the first column. A node must be linked to a team for it to receive tasks. During private preview, we support 500 nodes. At launch, we expect to support at least 2,000 nodes by default. We plan to work with customers to raise this limit for larger organizations.

COLUMN NAME	REQUIRED	DESCRIPTION
TargetName	Yes	This is the name of the node. The name can be up to 100 characters long and contain only the characters A-Z, a-z, and 0-9. Node names must be unique.

COLUMN NAME	REQUIRED	DESCRIPTION
ParentName	Yes	This is the name of the parent node. The value you specify here must match the value in the TargetName field of the parent node exactly. If you want to add more than one parent node, separate each parent node name with a semicolon (;). You can add up to 25 parent nodes, and each parent node name can be up to 2500 characters long. A node can have multiple parent nodes only if the parent nodes are root nodes. **IMPORTANT** Be careful not to create a loop where a parent higher up in the hierarchy references a child node lower in the hierarchy. This isn't supported.
TeamId	Yes, if the team publishes tasks or receives tasks from a parent node	This contains the ID of the team you want to link a node to. A node must be linked to a team if it's is at the bottom of your hierarchy, if you want users to be able to publish from that node, or if you want users to be able to see reporting for that node and its descendants. For example, if your manager for the West Region Office wants to see task completion reporting for the nodes that belong in that region. If you want to add a node only for the purpose of grouping other nodes in the hierarchy, you don't need to link that node to a team and can leave this field blank. You can link each node to only one team. To get the ID of a team you want to link a node to, run the following PowerShell command: `Get-Team | Export-Csv TeamList.csv` . This lists the teams in your organization and includes the name and ID for each team. Find the name of the team you want to link to, and then copy the ID into this field.

Add attribute columns

After you add the three required columns, you can add optional attribute columns. These attributes can be used to filter nodes so that you can more easily select the ones you want to publish tasks to. There are two ways to define your attributes, depending on whether values for that attribute are mutually exclusive.

WAYS TO ADD ATTRIBUTES	DESCRIPTION	EXAMPLE

WAYS TO ADD ATTRIBUTES	DESCRIPTION	EXAMPLE
If the values for an attribute are mutually exclusive, the column name you specify becomes the name of the attribute.	Each row can contain one value for that attribute, and each value can be up to 100 characters long. The set of attribute values you specify in the attribute column will be displayed as available filter values for that attribute in Teams apps that use the hierarchy. Each attribute column can have up to 50 unique values.	You want users to be able to filter stores by layout. The values for this attribute are mutually exclusive because a store can have only one layout. To add an attribute to filter stores by layout, add a column named Store layout. In this example, values for the Store layout attribute are Compact, Standard, and Large.
If you need to indicate multiple values for an attribute and the values aren't mutually exclusive, use the **AttributeName:UniqueValue** format for the column names.	The text string before the colon (:) becomes the name of the attribute. All columns that contain the same text string before the colon (:) are grouped together into a section in the filtering menu. Each of the strings after the colon become the values for that section. Each row can have a value of 0 (zero) or 1 for that attribute. A value of 0 means that the attribute doesn't apply to the node and a value of 1 means that the attribute applies to that node.	You want users to be able to filter stores by department. A store can have multiple departments and so the values for this attribute aren't mutually exclusive. In this example, we add Departments:Clothing, Departments:Electronics, Departments:Foods, Departments:Home and Garden, Departments:Sporting goods as attribute columns. Departments becomes the attribute name and users can filter by the Clothing, Electronics, Foods, Home and Garden, and Sporting goods departments.

When you add an attribute column, keep the following in mind:

- The column name you specify or the column name that you specify before the colon (:) becomes the name of the attribute. This value will be displayed in the Teams apps that use the hierarchy.
- The column name can be up to 100 characters long and contain only the characters A-Z, a-z, and 0-9, and spaces. Column names must be unique.
- At launch, we plan to allow 50 attribute columns.

Add bucket columns

You can add bucket columns to create buckets, which are groupings into which tasks can be organized. Each bucket gets its own column in the CSV file. The buckets you create are made available to the publishing team. The publishing team can then use these buckets to categorize tasks for the recipient teams. If a bucket doesn't already exist on a team, buckets are created on-demand when tasks are published.

By categorizing the work one time centrally, the publishing team can pre-organize the task list for all the tens, hundreds, or thousands of recipient teams that receive the task list. The recipient teams can then sort and filter their tasks by bucket to focus on the area most relevant to their work.

When you add a bucket column, note the following:

- The column name becomes the name of the bucket. Each bucket you specify will appear in the Buckets list in the Teams apps that use the hierarchy. We recommend that you don't include sensitive information in bucket names. At this time, publishing teams can't remove a bucket through publishing after it's created.
- The column name must be preceded by a hashtag (#). It can be up to 100 characters long and contain only the characters A-Z, a-z, and 0-9. For example, #Operations and #Frozen Goods.
- At launch, we expect to support 25 bucket columns. We plan to work with customers to increase this limit for larger organizations.

Example

Here's an example of a schema CSV file that would be created to support the hierarchy shown in the image above. This schema contains the following:

- Three required columns named `TargetName`, `ParentName`, and `TeamId`
- Three attribute columns named `Store layout`, `Departments:Clothing`, and `Departments:Foods`
- Three bucket columns named `Fresh Foods`, `Frozen Foods`, and `Womenswear`

The `Store layout` attribute has values that include `Compact`, `Standard`, and `Large`. The `Departments` attribute columns can be set to a value of `0` (zero) or `1`. The `Store` layout and `Departments` attributes aren't shown in the image above. They're added here to help show how attributes can be added to node entries. The same is true for the three bucket columns.

TARGETNAME	PARENTNAME	TEAMID	STORE LAYOUT	DEPARTMENTS:CLOTHING	DEPARTMENTS:FOODS	#FRESH FOODS	#FROZEN FOODS	#WOMENSWEAR
Recall		db23e6ba-04a6-412a-95e8-49e5b01943ba						
Communications		145399ce-a761-4843-a110-3077249037fc						
HR		b8f7db91-201c-4cf9-9f7e-90a4894ed8e4						
East Regional Office								
West Regional Office								
North East Zone	East Regional Office							
South East Zone	East Regional Office							

TARGETNAME	PARENTNAME	TEAMID	STORE LAYOUT	DEPARTMENTS:CLOTHING	DEPARTMENTS:FOODS	#FRESH FOODS	#FROZEN FOODS	#WOMENSWEAR
New York Store	North East Zone	e2ba65f6-25e7-488b-b8f0-b8562d5de60a	Large	1	1			
Boston Store	North East Zone	0454f08a-0507-437c-969a-682eb2fae7fc	Standard	1	1			
Miami Store	South East Zone	619d6e4e-5f68-4b36-8e1f-16c98d7396c1	Compact	0	1			
New Orleans Store	South East Zone	6be960b8-72af-4561-a343-9ac4711874eb	Compact	0	1			
Seattle Store	West Regional Office	487c0d20-4e55-4dc2-8187-a24c826e0fee	Standard	1	1			
Los Angeles Store	West Regional Office	204a1287-2efb-4a8a-88e0-56fbaf5a2389	Large	1	1			

Apply your hierarchy

> **IMPORTANT**
> To perform this step, you must install and use the Teams PowerShell public preview module from the PowerShell Gallery. For steps on how to install the module, see Install Teams PowerShell.

After you've defined your hierarchy in the schema CSV file, you're ready to upload it to Teams. To do this, run the following command. You must be a global admin or Teams service admin to perform this step.

```
Set-TeamTargetingHierarchy -FilePath "C:\ContosoTeamSchema.csv"
```

Remove your hierarchy

> **IMPORTANT**
> To perform this step, you must install and use the Teams PowerShell public preview module from the PowerShell Gallery. For steps on how to install the module, see Install Teams PowerShell.

If you want to immediately disable the **Published lists** tab for all users in your organization, you can remove your hierarchy. Users won't have access to the **Published lists** tab or any of the functionality on the tab. This includes the ability to create new task lists to publish, access draft lists, publish, unpublish, and duplicate lists, and view reporting. Removing the hierarchy doesn't unpublish tasks that were previously published. These tasks will remain available for recipient teams to complete.

To remove your hierarchy, run the following command. You must be an admin to perform this step.

```
Remove-TeamTargetingHierarchy
```

Troubleshooting

You receive an error message when you upload your schema CSV file

Take note of the error message as it should include troubleshooting information to indicate why the schema couldn't be uploaded. Review and edit your schema CSV file based on the information in the error message and then try again.

You receive an "Error: InvalidTeamId" error message when you upload your schema CSV file

When you try to upload your schema CSV file, you get the following error message:

```
Error: InvalidTeamId
Description: TeamID in row # doesn't match a valid Group ID. Please view our documentation to learn how to get
the proper GroupID for each team.
```

Check to make sure that you're using the correct TeamId for the team in your schema CSV file. The TeamId should be the same as the Group ID of the Microsoft 365 group that backs the team. You can look up the Group ID of the team in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams** > **Manage teams**.
2. If the **Group ID** column isn't displayed in the table, select **Edit columns** in the upper-right corner of the table, and then turn on **Group ID**.
3. Find the team in the list, and then locate the Group ID.

Make sure that the TeamId in your schema CSV file matches the Group ID that's displayed in the Microsoft Teams admin center.

Related topics

- Manage the Tasks app for your organization in Teams
- Teams PowerShell overview

Manage the Praise app in the Microsoft Teams admin center

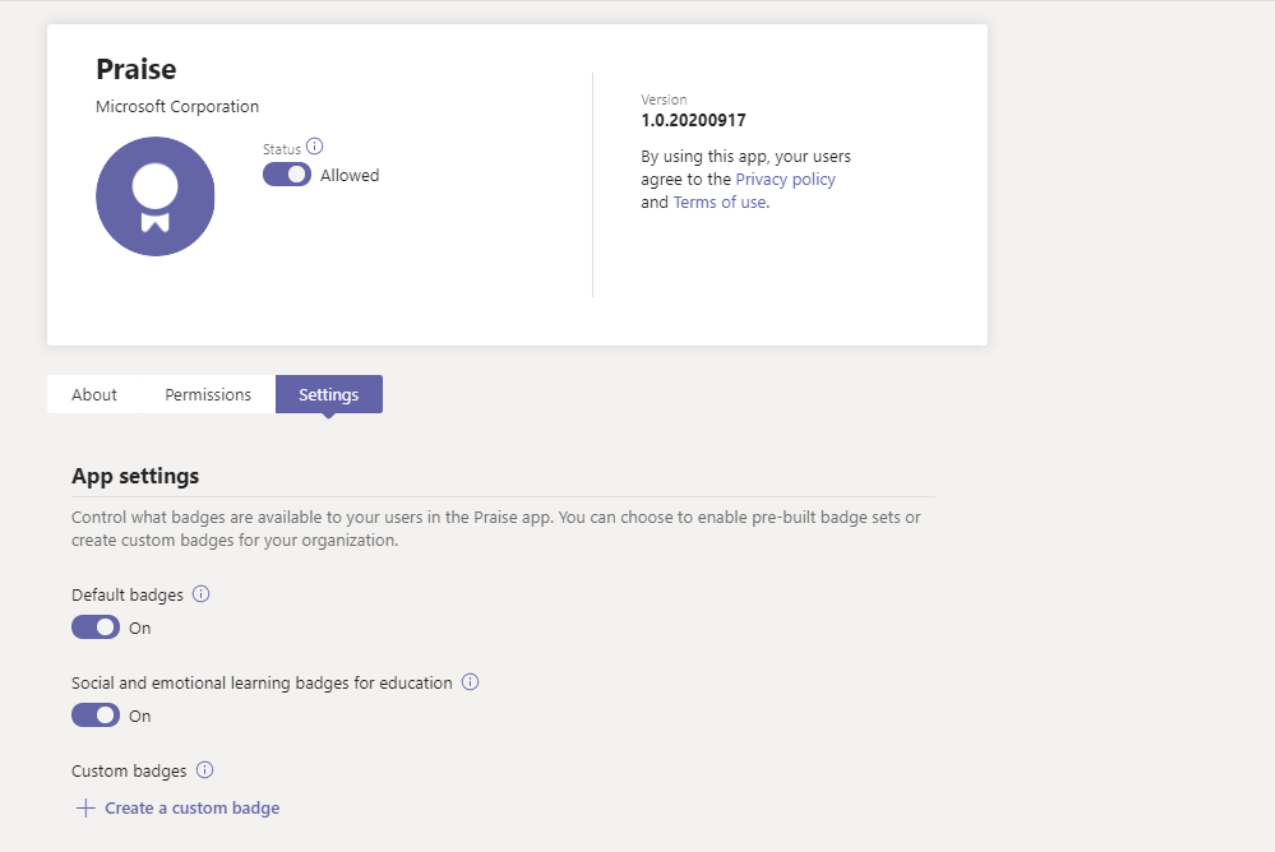
12/5/2020 • 4 minutes to read • Edit Online

NOTE

Admins must have a Teams license to access this feature. If you try to access this feature without a Teams license, you'll get an error message.

The Praise app in Microsoft Teams helps users show appreciation to members of their organization or classroom. With a selection of badge sets to choose from and the option to create your own badges, Praise is designed to help recognize the effort that goes into the wide range of work that Teams users do, from educators to Firstline Workers. To learn more, check out Send Praise to people.

Admins can control what badges are available to their organization from the Microsoft Teams admin center. In the left navigation, go to **Teams apps** > **Manage apps**. In the list of apps, click **Praise**, and then select **Settings**. From here, you can choose to enable default and built-in badge sets and create custom badges.



NOTE

The Praise app feature isn't available for U.S. government clouds.

Use built-in badge sets

Built-in sets are collections of badges designed by Microsoft for the Praise app. These sets are not editable by

admins. The default badge set is already enabled and available in the Praise app. To change the availability of the default set or of any badges sets, switch the corresponding toggle to On or Off.

Default badges

The default badge set is designed to help Teams users recognize their peers for going above and beyond with their work.



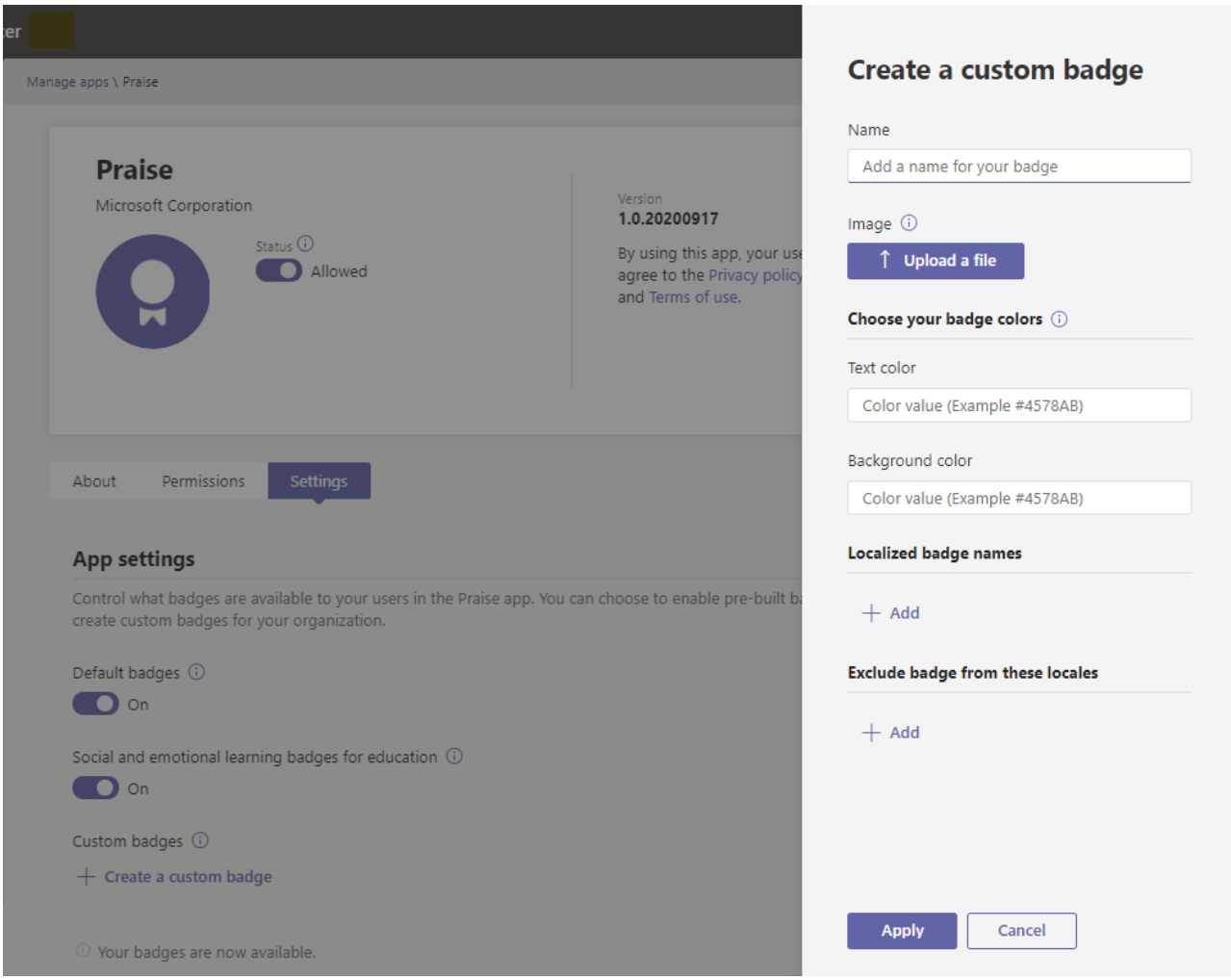
Social and emotional learning badges for education

Educators can recognize individual students for social and emotional learning (SEL) achievements and behaviors with badges that illustrate these concepts.



Create your own badges

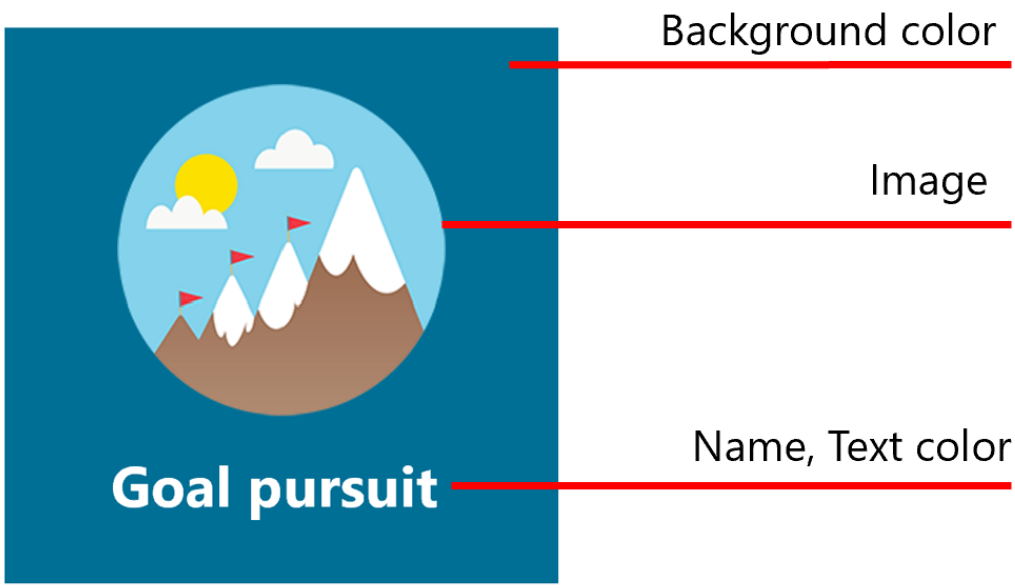
Select **Create a custom badge**. From here, you can design a custom badge in the side panel. You can create up to 25 custom badges.



1. Enter a badge name. This is the name that will appear on the badge when users send praise.
2. Set your badge colors. To set the text and background colors of your badge, you need to enter the colors as hexadecimal (hex) values.

   > **TIP**
   >
   > If you're new to hex values, this article includes a quick introduction to show you how to use them.

3. Upload a badge image. The accepted file type is .PNG. The image file must be less than 40 KB with maximum dimensions of 216 X 216 pixels.



4. Localize your badge name: Under **Localized badge names**, select **Add**. Select the desired locale from the drop-down list. Then enter the badge name in the designated language.
5. Exclude your badge from specific locales: Under **Exclude badge from these locales**, select **Add**. Select the locales you want to exclude from the drop-down list.
6. Select **Apply**. Your new badge will now appear in the custom badges table.

> **NOTE**
>
> If steps 4 and 5 are skipped, the badge will be in the default language for all locales.
>
> When you're finished making changes to your badge selection, make sure to select **Submit**. It may take up to a few hours before these changes are available to your organization.

Specify colors with hex values

Hex color values are strings of six hexadecimal digits that represent the intensity of red (RR), green (GG), and blue (BB) in a specific color on a scale of 00 to FF. When you put the values of all three colors together, you get a hex value: #RRGGBB

For example, the hex value for the color red is #FF0000 because red is set at the highest possible value, FF, and green and blue are each set at the lowest possible value, 00.

To explore different colors and their hex values, check out Bing color picker.

Below is a list of example colors to get you started:

COLOR	HEX VALUE
	#FF6666

COLOR	HEX VALUE
	#7FFFD4
	#FF75F0
	#00BFFF
	#800080
	#000000

Best practices for creating custom badges

Submit all your badges at once. Because it takes a while for new badges to be processed, it's best to add all your custom badges to the table before submitting them.

When choosing colors, keep accessibility in mind. Some colors go together better than others. Create contrast between your text and background colors to make the badge name easy to read. For example, if you chose a dark background color, choose a light text color.

When selecting an image, keep badge dimensions in mind. For the best quality, we recommend uploading an image file that is 216 x 216 pixels (which are the maximum dimensions). Avoid stretching or distorting the image to fit these dimensions.

If your badge image isn't rectangular, make the image transparent. You'll need to do this before uploading the image file to Praise.

Non-transparent image:



Transparent image:



Badge set assets

Built-in badge sets can't be modified, so when a built-in set is enabled, all badges in the set are added to the Praise

app. If you want to add specific badges from a built-in set and leave out others, re-create the badges you want to use as custom badges. You can download the badge image and find the text and background colors of badges from built-in sets in the tables below.

Default badges assets

BADGE NAME	IMAGE FILE	TEXT COLOR	BACKGROUND COLOR
Achiever	Achiever PNG	#D36E70	#E3F4FC
Awesome	Awesome PNG	#8283B2	#D1EFF2
Coach	Coach PNG	#6AA55A	#DBF1D6
Courage	Courage PNG	#DC5041	#FCF6C8
Creative	Creative PNG	#CF9D50	#FCF6C8
Inclusive	Inclusive PNG	#3C77BB	#E2F4FC
Kind Heart	Kind Heart PNG	#D36D6E	#F4DEDE
Leadership	Leadership PNG	#419098	#D2EAEC
Optimism	Optimism PNG	#D8338C	#F4DDDE
Problem solver	Problem solver PNG	#B8916E	#CBDADF
Team player	Team player PNG	#8B8DC0	#F4EEC0
Thank you	Thank you PNG	#469CA4	#BACCB6

Social and emotional learning badges for education assets

BADGE NAME	IMAGE FILE	TEXT COLOR	BACKGROUND COLOR
Communication	Communication PNG	#FFFFFF	#173B65
Critical thinking	Critical thinking PNG	#FFFFFF	#084D26
Curiosity	Curiosity PNG	#FFFFFF	#008078
Empathy	Empathy PNG	#FFFFFF	#650B35
Goal pursuit	Goal pursuit PNG	#FFFFFF	#006F95
Motivation	Motivation PNG	#FFFFFF	#C52127
Persistence	Persistence PNG	#FFFFFF	#167D3E

BADGE NAME	IMAGE FILE	TEXT COLOR	BACKGROUND COLOR
Respect	Respect PNG	#FFFFFF	#8251A0
Responsibility	Responsibility PNG	#FFFFFF	#B05DA3
Self-awareness	Self-awareness PNG	#FFFFFF	#1680E5
Self-management	Self-management PNG	#FFFFFF	#4C144D
Thoughtfulness	Thoughtfulness PNG	#FFFFFF	#EE4086

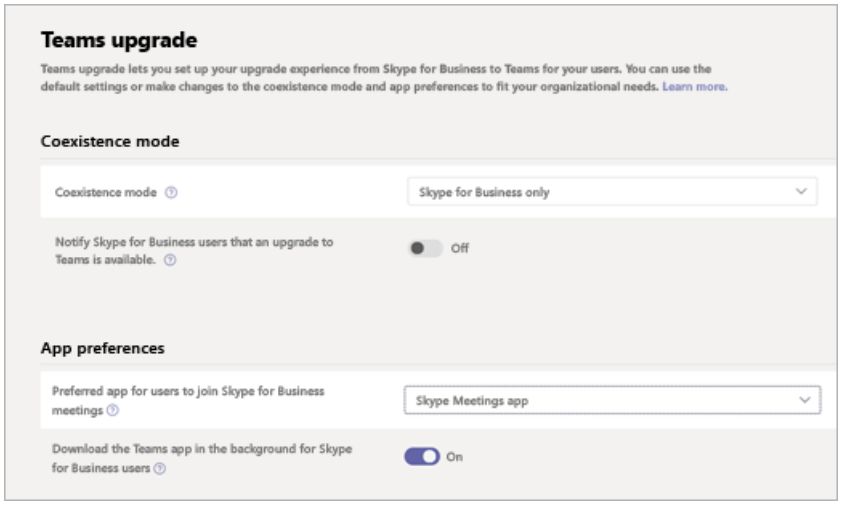
Configure the Skype Meetings App to work with Teams

8/6/2020 • 2 minutes to read • Edit Online

After a user is upgraded to Microsoft Teams, admins can use the Microsoft Teams admin center to specify the preferred app that users will use to join Skype for Business meetings.

To specify the Skype for Meetings App as the preferred app:

1. Sign in to the Microsoft Teams admin center.
2. In the left pane, under **Org-wide settings**, select **Teams upgrade**.
3. On the Teams upgrade page, under **App preferences**, select **Skype Meetings App** from the **Preferred app for users to join Skype for Business meetings** drop-down list.



Known limitations

Users who use the Skype Meetings App with Teams are subject to the following limitations:

- Users have no option to change their video device.
- After a user is upgraded to Teams, if the user is in a meeting using the Skype Meetings App and then receives a call on Teams, the meeting in Skype Meetings App is not placed on hold. Instead, the user is connected to both calls.

More information

- What is Skype Meetings App (Skype for Business Web App)
- Skype Meetings App minimum network requirements

Admin quick start - Meetings and live events in Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

There are 2 ways to meet in Microsoft Teams - meetings and live events. Use this article to quickly roll out and configure meetings and live events for your organization.

> **NOTE**
> For details about quickly configuring Teams meetings and events on different platforms, see Teams features by platform.

- **Meetings** in Teams include audio, video, and screen sharing for up to 300 people. They're one of the key ways to collaborate in Teams. And you don't need to be a member of an organization (or even have a Teams account!) to join a Teams meeting—just look in the invitation for instructions about calling in.
- **Live events** are an extension of Teams meetings that enable you to schedule and produce events that stream to large online audiences - up to 10,000 people. If you need a meeting for more than 300 people, use a live event.

Get licenses for meetings and live events

Anyone can attend a Teams meeting or public live event for free - no license is required. Attendees join a Teams meeting or live event by clicking the **Join** button in Teams or the meeting invitation. Meeting audio is part of a Teams meeting, but if you want people to be able to dial in to a meeting by phone, you'll need to provide a dial-in number.

For the people who will organize, schedule, and host meetings or live events, they'll need one of the Microsoft 365 or Office 365 licenses listed in the table below. If you're already using Teams, you probably have the license you need for organizing and hosting meetings and live events.

<table>
<tr><th></th><th colspan="6">Office 365 and Microsoft 365 licenses</th></tr>
<tr><th>I want to:</th><th>F1</th><th>F3</th><th>E1</th><th>E3</th><th>E5</th><th>Audio Conferencing add-on</th></tr>
<tr><td>Join a Teams meeting</td><td colspan="6">No license required. Any email address can participate in a Teams meeting.</td></tr>
<tr><td>Attend a Teams meeting with a dial-in phone number</td><td colspan="6">No license required. Any phone number can dial into a Teams meeting. [1]</td></tr>
<tr><td>Attend a Teams live event</td><td colspan="6">No license required.</td></tr>
<tr><td>Create a Teams meeting for up to 250 attendees</td><td></td><td colspan="4">One of these licensing plans</td><td></td></tr>
<tr><td>Create a Teams meeting for up to 250 attendees with a dial-in phone number</td><td></td><td colspan="5">One of these licensing plans + Audio Conferencing[1]</td></tr>
<tr><td>Create a Teams live event for up to 10,000 attendees</td><td></td><td></td><td colspan="2">One of these licensing plans</td><td></td><td></td></tr>
<tr><td>Dial out from a Teams meeting to add someone at their Call me at number</td><td></td><td colspan="5">One of these licensing plans + Audio Conferencing[2]</td></tr>
</table>

[1] Meeting organizers need to have an Audio Conferencing add-on license to send an invite that includes dial-in conferencing.

[2] Meeting dial out to a **Call me at** number requires organizers to have an E5 or Audio Conference add-in license. A dial plan may also be needed.

To learn more about licensing, read Microsoft Teams service description.

Make sure your network's ready

If you already prepared your network when you rolled out Microsoft 365 or Office 365, you're probably all set. In any case - and especially if you're rolling out Teams quickly as your first Office 365 workload to support **remote workers** - read Prepare your organization's network for Teams to be sure you're ready.

Meetings and conferencing

- As the admin, you'll configure meeting settings for everyone. Then you'll use meeting policies to control what meeting features are (and aren't) available for your users.
- To learn about managing meeting recording, read Teams cloud meeting recording.
- If your users are new to Teams meetings, share the Manage meetings training with them. Check out our instructor-led online class, Run effective meetings with Teams.
- To learn about managing meeting options, read Change participant settings for a Teams meeting.
- Don't forget about managing your users' devices - phones, headsets, cameras. To get the latest and up-to-date information on Teams certified devices, go to Teams devices.

Live events

- Similar to meetings, you - the admin - configure live events for everyone. Then set up (and assign) live event policies to control what your users can (and can't) do.
- Make sure your live event producers and organizers are trained - send them to Get started with live events.
- If you're new to live events, check out What are Teams live events? and Plan for Teams live events.

Related topics

Meetings and conferencing in Teams

Audio conferencing in Teams

Live events in Teams

Limits and specifications for Teams

Microsoft Technical Community: Live events in Microsoft 365

Meetings and conferencing in Microsoft Teams

12/5/2020 • 9 minutes to read • Edit Online

NOTE

- For an overview of making the transition to remote learning and resources to help you get started, see our **remote learning home page**.
- Resources to assist educators and students with remote learning are available in **Remote teaching and learning in Office 365 Education**.

You've completed Get started. You've rolled out Teams with chat, teams, channels, & apps across your organization. Now you're ready to add the meetings workload, including audio conferencing, video, and sharing. This article walks you through the rollout of meetings and audio conferencing. Start by watching our Teams meetings, conferencing, and devices video (3:28 minutes):

To learn more about the meetings experience for your users, see Meetings and calls.

New in April 2020: Meeting organizers can end a meeting for all meeting participants in Teams by clicking **End meeting** in the meeting controls within the meeting.

New in November 2019: You can now use Advisor for Teams (preview) to help you roll out Microsoft Teams. Advisor for Teams (preview) walks you through your Teams rollout, including meetings and conferencing. It assesses your Office 365 environment and identifies the most common configurations that you may need to update or modify before you can successfully roll out meetings and conferencing in Teams.

NOTE

For details about Teams meetings and conferencing on different platforms, see Teams features by platform.

Meetings and conferencing deployment decisions

Teams provides a great out-of-the-box experience for your organization, and most organizations find that the default settings work for them. This article helps you decide whether to change any of the default settings, based on your organization's profile and business requirements, then it walks you through each change. We've split the settings into two groups, starting with the core set of changes you're more likely to make. The second group includes the additional settings you may want to configure, based on your organization's needs.

TIP

Watch the following session to learn more about Meetings: Introduction to Meetings in Microsoft Teams for IT Pros

Meetings and conferencing prerequisites

Before scaling your meetings deployment across your organization, take time to review and confirm that your environment is ready to provide users with the best possible experience. Review the following information and make any required changes to your environment as needed.

To get the best experience on Teams, your organization must have deployed Exchange Online and SharePoint

Online, and you must have a verified domain for O365 such as *contoso.com*.

To scale meetings across your organization you should ensure that all user locations have internet access to connect to the Office 365 Services. At a minimum you should make sure that the following common ports are open to the internet from your user's locations:-

- TCP ports 80 and 443 outgoing from clients that will use Teams
- UDP ports 3478 through 3481 outgoing from clients that will use Teams

ASK YOURSELF	ACTION
Is my network ready for Teams meetings deployment?	To verify that your network is ready, see: • Prepare your organization's network for Microsoft Teams • URLs and IP address ranges

Core deployment decisions

These are the settings that most organizations want to change (if the Teams default settings don't work for the organization).

Teams administrators

Teams provides a set of custom administrator roles that can be used to manage Teams for your organization. The roles provide various capabilities to administrators.

ASK YOURSELF	ACTION
Who will be assigned the Teams Communications Administrator role?	To learn more about Teams administrator roles see Use Microsoft Teams admin roles to manage Teams.
Who will be assigned the Teams Communications Support Engineer role?	To assign admin roles, see Assign administrator and non-administrator roles to users with Active Directory.
Who will be assigned the Teams Communications Support Specialist role?	

Meetings settings

Meetings settings are used to control whether anonymous users can join Teams meetings, set up meeting invitations, and if you want to turn on Quality of Service (QoS), set the ports for real-time traffic. These settings will be used for all of the Teams meetings that users schedule in your organization.

ASK YOURSELF	ACTION
Will I customize the initial meeting settings?	See the Meetings in Teams tutorial to learn more about meetings settings.
Will I implement QoS?	See Quality of Service in Microsoft Teams for information about QoS concepts. scenarios, and implementation.

Meeting policies

Meeting policies are used to control what features are available to users when they join Teams meetings. You can use the default policy or create one or more custom meeting policies for people that host meetings in your organization. To learn more, see the Meetings in Microsoft Team tutorial.

ASK YOURSELF	ACTION
• Will I customize the initial meeting policies? • Do I require multiple meeting policies? • How will I determine which groups of users get which meetings policy applied?	Read Manage meeting policies in Teams.

Audio Conferencing

Audio Conferencing provides organizations with additional entry points to any meeting (ad hoc or scheduled) by allowing meeting participants to join via public switched telephone network (PSTN) by dialing in using a traditional land line, private branch exchange (PBX), or mobile phone.

When you're ready to roll out Audio Conferencing, see the in-depth Audio Conferencing rollout guidance.

Meeting room and personal devices

For an optimal meeting experience in Teams, consider using Teams devices such as room systems, phones, headsets, and cameras. To learn more, see Teams devices for intelligent communications.

ASK YOURSELF	ACTION
Will I purchase personal devices for my users?	Read Manage your devices in Teams.
Will I purchase and deploy room system devices for my conference rooms?	Read Meeting room devices and solutions.

Reporting

Use activity reports to see how users in your organization are using Teams. For example, if some don't use Teams yet, they might not know how to get started or understand how they can use Teams to be more productive and collaborative. Your organization can use the activity reports to decide where to prioritize training and communication efforts.

ASK YOURSELF	ACTION
Who will be responsible for reporting?	Read Use activity reports for Teams.
Who will be responsible for monitoring usage?	Read Monitor usage and feedback in Teams.

Additional deployment decisions

You may want to change these settings, based on your organization's needs and configuration.

Bandwidth planning

Bandwidth planning lets organizations estimate the bandwidth that will be required to support meetings across their wide area networks and internet links so they can confirm that the network is correctly provisioned to support a scaled out meeting service.

ASK YOURSELF	ACTION
Do I need to do bandwidth planning prior to and during my Meetings rollout?	See Network Readiness for more information and links to tools to simplify your planning process.

Meeting recording and archiving

Users can record their meetings and group calls to capture audio, video, and screen sharing activity. There is also an option for recordings to have automatic transcription, so that users can play back meeting recordings with closed captions and search for important discussion items in the transcript. The recording happens in the cloud and is saved in Microsoft Stream, so users can share it securely across their organization. To find the recording for a meeting, go to the meeting conversation.

> **NOTE**
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

To learn more, see Teams cloud meeting recording.

ASK YOURSELF	ACTION
Will I turn on the meeting transcription service?	See Turn on or turn off recording transcription

Live events policies

Teams live events policies are used to manage event settings for groups of users. You can use the default policy or create additional policies that can be assigned to users who hold live events within your organization.

ASK YOURSELF	ACTION
Will my organization use Teams live events?	See the live events articles for more information about planning for, setting up, and configuring Teams live events.

Conference room systems rollout

Organizations with many conference rooms may want to consider a structured approach to inventorying their rooms, identifying the appropriate devices, and then rolling them out.

ASK YOURSELF	ACTION
What do I need to do to roll out conference room systems?	Check out the Plan Microsoft Teams Rooms articles.

Cloud video interop

Cloud video interop makes it possible for third-party meeting room devices to join Teams meetings.

Video teleconferencing with content collaboration helps you make the most out of meetings. However, meeting room systems and devices are expensive to upgrade. Cloud video interop for Teams works with third-party systems and delivers a native meeting experience for all participants – in meeting rooms or inside Teams clients.

ASK YOURSELF	ACTION
Will I use a cloud video interop solution as part of my room systems deployment?	Read Cloud Video Interop for Teams.

Personal device rollout

When planning a larger rollout of personal devices to support meetings or voice deployments, consider using a repeatable site-by-site rollout process that delivers repeatable quality.

ASK YOURSELF	ACTION
Will I use a site-by-site approach to roll out Meetings?	The Site enablement playbook for Teams provides a good foundation that you can use for your own deployments. The guide is focused on voice, but the general principles of device delivery, account readiness, adoption, and training apply to a large meeting deployment.

Troubleshoot meeting and call quality

Teams gives you two ways to monitor and troubleshoot call quality problems: Call Analytics and Call Quality Dashboard. Call Analytics shows detailed information about the devices, networks, and connectivity related to the specific calls and meetings for each user. Call Analytics is designed to help admins and helpdesk agents troubleshoot call quality problems with specific calls, whereas the Call Quality Dashboard is designed to help admins and network engineers optimize a network. Call Quality Dashboard shifts focus from specific users and instead looks at aggregate information for an entire Teams organization.

ASK YOURSELF	ACTION
Who will be responsible for monitoring and troubleshooting call quality issues?	Read Use Call Analytics to troubleshoot poor call quality for information about permission levels required to troubleshoot call quality issues.

Operate your meetings service

It's important that you understand the overall health of the Teams service so that you can proactively alert others in your organization of any event that affects the service. The Operate my service articles provide in-depth guidance for service operations.

ASK YOURSELF	ACTION
Who in my organization will be responsible for managing the meetings service?	Make sure this person has the Teams admin permissions they need in order to manage your meetings service. To learn more about Teams administrator roles see Use Microsoft Teams admin roles to manage Teams.

Next steps

- Drive adoption of meetings & conferencing throughout your organization.
- Add audio conferencing
- Roll out cloud voice

- Include featured apps - such as Planner - in your initial Teams rollout. Add other apps, bots, & connectors as you drive Teams adoption.

Microsoft Teams Rooms

12/5/2020 • 2 minutes to read • Edit Online

Transform meeting spaces ranging from small huddle areas to large conference rooms with a rich, collaborative Teams experience that's simple to use, deploy, and manage.
Start meetings on time with one-touch join, then instantly project to the display in the room and share to remote participants.
Select the right system and audio video peripherals from one of our partners: Yealink, Logitech, Crestron, Polycom, Lenovo, and HP.



Plan	Deploy	Manage

NOTE

Microsoft Teams Rooms is intended for use with Microsoft Teams, Skype for Business Online, Skype for Business Server 2019, or Skype for Business Server 2015.

Earlier platforms like Lync Server 2013 aren't expected to work with Microsoft Teams Rooms.

These articles are intended for people tasked with planning, deploying, and managing these devices, and not for the users of the system. Users will be more interested in the Microsoft Teams Rooms online help.

NOTE

Skype Room System (formerly Lync Room System) and Microsoft Teams Rooms are different products with different dependencies and deployment procedures.

Plan Microsoft Teams Rooms

12/5/2020 • 7 minutes to read • Edit Online

This article introduces an end-to-end approach to planning, delivering, and operating Microsoft Teams Rooms as part of your overall meeting and conference room strategy.

You'll find planning information below covering the recommended approach and key decisions that you need to make, with links to supporting technical information. We recommend that you review the Plan, Deploy, and Manage sections even if you're already fully deployed.

Overview of Microsoft Teams Rooms

Microsoft Teams Rooms provides a complete meeting experience that brings HD video, audio, and content sharing to meetings of all sizes, from small huddle areas to large conference rooms.



Microsoft Teams Rooms help is a great resource to find out more about Microsoft Teams Rooms and how it can add value as part of your deployment. In addition, we recommend watching this overview video.

Microsoft Teams Rooms components

Microsoft Teams Rooms includes the following key components to deliver a great user experience:

- Touchscreen control panel
- Compute
- Microsoft Teams Rooms application
- Dock/extender
- Peripheral devices (camera, microphone, speaker)
- External screens (maximum of two)
- HDMI input

You can procure these components as preinstalled bundles from a number of vendors, or you can purchase the supported components individually by following the requirements documented in this article.

In addition to the Surface Pro/dock combination, you can also purchase Microsoft Teams Rooms with the

touchscreen control panel, compute, dock, and key peripheral devices integrated.

Typically, the bundles and integrated units include preinstalled software, whereas if you buy supported components individually for the Surface Pro systems, you'll need to install the software. For instructions, see this article about installing software on devices.

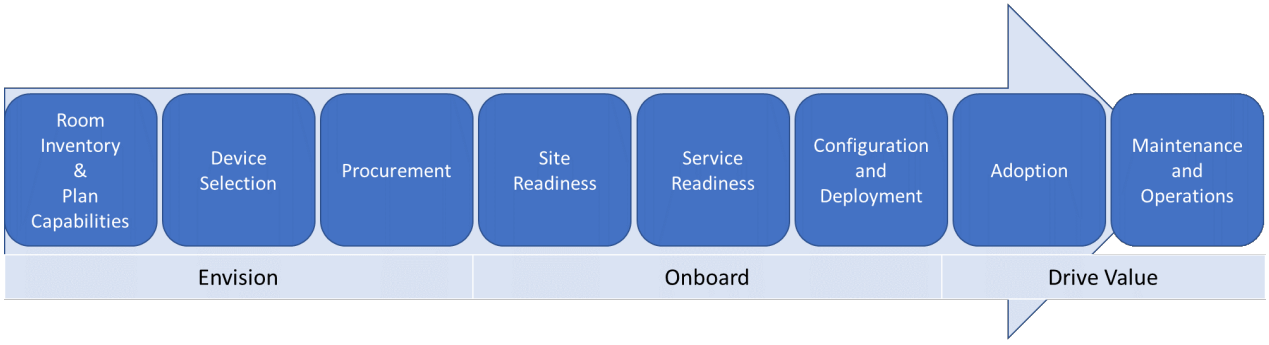
You can deploy Microsoft Teams Rooms with Microsoft Teams, Skype for Business Online, or Skype for Business hybrid or on-premises deployments. See the Teams Meeting Room Licensing Update for information on the needed licenses.

Decision points	• Will you deploy Microsoft Teams Rooms in your organization? • How will you procure your Microsoft Teams Rooms systems—bundled, as separate components, or as an integrated unit?
Next steps	• Identify who will undertake the key activities throughout your deployment. • Review the meeting rooms you have (and plan to set up) to understand where you want to deploy Microsoft Teams Rooms and the peripheral devices that would be appropriate for the room size.

Identify who will undertake the key activities throughout your deployment

Use the approach illustrated below to guide you through your deployment, and customize the sample outputs provided throughout these articles as needed for your organization.

Begin with understanding what conference rooms you have and envisioning what would work best for you in the future, then move through selecting and procuring the equipment you need, readying your sites, configuring and deploying your service, managing change and user adoption, and developing operations and maintenance procedures.



You might need to coordinate these activities across several teams. We provide a high-level view of the main activities that you should cover, and also suggestions for the teams who are typically involved in deploying and managing conference room systems, to help you decide who you need to work with.

TASK	WHO MIGHT UNDERTAKE THE TASK	ASSIGNED TO	LINKS TO THIS CONTENT

TASK	WHO MIGHT UNDERTAKE THE TASK	ASSIGNED TO	LINKS TO THIS CONTENT
Inventory rooms	Facilities / AV team / IT Project Team		Room inventory and capability planning
Plan capabilities	IT Project Team		Room inventory and capability planning
Device selection	IT Project Team / AV Team		Device selection
Procurement	IT Project Team / AV Team		Procurement
Site readiness	Facilities / AV team / IT Project Team		Site readiness
Service readiness	IT Project Team		Service readiness
Configuration	IT Project Team		Configuration and deployment
Deployment	Facilities / AV team / IT Project Team		Deployment checklist
Adoption	Facilities / AV team / IT Project Team		Adoption
Maintenance and operations	AV team / IT Project Team		Management overview

Room inventory and capability planning

The first step is to inventory your organization's existing meeting and conference rooms to understand their environment, room size, layout, and purpose, and to identify the capabilities you want each room in scope to have in the future such as which richer collaboration capabilities will be enabled in the room.

After you create an inventory of the equipment and capabilities in each existing room, your requirements for that room feed into your device selection planning to create a rich conferencing solution. The modalities (audio, video) needed for each room—in addition to room size and purpose—all play an important role in deciding which solution is most appropriate for each room.

As part of your discovery, it's key to consider room acoustics and layout. For example, check that the chairs in the room won't block the camera view. Verify that the room doesn't have excessive echo or noisy air conditioning, and that it does have sufficient power for the screens and Microsoft Teams Rooms. There are many factors to consider that your audio-visual (AV) team or partner will be able to advise on.

Decision points	• Which rooms are in scope for this deployment? • Which sites are in scope for your deployment? • Who will undertake the meeting rooms inventory?
Next steps	• Review the rooms in scope, and define Microsoft Teams Rooms configurations for them.

Sample meeting/conference room inventory

SITE	ROOM NAME	ROOM TYPE	NUMBER OF PEOPLE	IN SCOPE?	CURRENT ROOM CAPABILITIES	FUTURE ROOM CAPABILITIES
London HQ	Curie	Medium	6–12	Yes	Speakerphone	1 screen, audio and video plus presentation PSTN Access
Sydney HQ	Hill	Large	12–16	Yes	Legacy AV unit, 1 screen and camera	2 screens, audio and video plus presentation PSTN Access

Device selection

Evaluate which Microsoft Teams Rooms solution is the most suitable for each room based on the future capabilities you want for the room. Decide which AV peripheral devices are the best fit, depending on room size and layout.

For guidance for the type of system and peripheral devices by room type and size, see the Microsoft Teams Rooms requirements article.

Based on the vendor you prefer, use the information provided in the requirements article to define your Microsoft Teams Rooms and supported peripheral device configuration per room type, and use this as a template for your deployment.

Pro Tip – Some room types might not be applicable for your deployment.

Decision points	• From your inventory, which types of rooms are in scope for your deployment? • Which systems will you deploy for each room type?
Next steps	• Start to gather key operational material for your chosen systems, and engage your procurement team.

Sample Microsoft Teams Rooms deployment template for your organization

ROOM TYPE/SIZE	NUMBER OF PEOPLE	MICROSOFT TEAMS ROOMS SYSTEM	PERIPHERAL DEVICES	DISPLAY(S)
Focus 10' by 9'	2–4			
Small 16' by 16'	4–6			
Medium 18' by 20'	6–12			
Large 15' by 32'	12–16			

Pro Tip – Now is a great time to start gathering information about the Microsoft Teams Rooms solution you've

chosen.

Procurement

You can procure your chosen system as a bundle or an integrated solution via device partners. You can also acquire a partner device dock and prepare your own Microsoft Teams Rooms solution by using a Surface Pro device and existing, *supported* AV peripheral devices.

You can acquire Microsoft Teams Rooms from a number of partners who are listed in the requirements article. Please visit the partners' websites to learn more about these solutions and procurement options.

Depending on your deployment scale and approach, you might decide to have the Microsoft Teams Rooms and supported peripheral devices shipped to a central location for initial configuration and assignment. This might be a good approach for a staged rollout across many sites. Or, you might choose to ship the bundles directly to your sites.

 Decision points	• Will you ship the components directly to a site or to a staging facility? • Who will manage the staging facility (if you decide to use one)?
 Next steps	• Plan for operations. • Plan for adoption and change management.

Plan for operations

Your organization must execute monitoring, administration, and management tasks on an ongoing basis, and it's key to agree who will undertake these tasks early in your deployment.

Many organizations have an AV team or partner who manages their conference rooms and devices. This team should be involved in agreeing who will manage the Microsoft Teams Rooms devices going forward to monitor performance, and deploy software updates and hotfixes.

Consider which helpdesk queue you'll route Microsoft Teams Rooms–related calls to, and provide an FAQ to the helpdesk team so they can better understand how to use Microsoft Teams Rooms and the key troubleshooting steps they can take. A good starting point for this FAQ is the user help and Known issues.

 Decision points	• Decide who will manage Microsoft Teams Rooms. • Decide which helpdesk queue to route Microsoft Teams Rooms–related calls to.
 Next steps	• Prepare to host accounts.

Plan for adoption and change management

Microsoft Teams Rooms systems introduce new capabilities to your users. It's important that you recognize that this will be a change for your users, and you should ensure your campaign identifies the benefits the new system will have for your users and the key talking points leads can use to discuss with their teams.

Consider scheduling show-and-tell events and poster drops at each site to inform your users of the new capabilities. You might also create in-room “quick start guides.” Consider finding a meetings champion on each site who can help others get up to speed and start using the devices.

Microsoft Teams Rooms app version support

11/2/2020 • 3 minutes to read • Edit Online

The Microsoft Teams Rooms app gets updates a few times per year. Each update supported for twelve (12) months from its general availability (GA) release date. Technical support is provided for the entire twelve (12) months. However, the support structure is dynamic, with two distinct phases that depend on the availability of the latest version:

- **Servicing and Critical Updates phase** - When you run the latest version of the Microsoft Teams Rooms app, you receive regular updates that contain *Security and Servicing* updates.
- **Security Updates Only phase** - When a new version of the Microsoft Teams Rooms app releases, older versions of the app have a reduced support level with *Security updates only* for the rest of the twelve (12) month lifecycle.

> **NOTE**
> The latest version is always in the Servicing and Critical Updates phase. When you encounter a code defect that warrants a critical update, you must also have the latest version installed to receive a fix. All other supported versions will only be eligible to receive security updates.

All support ends after the twelve (12) month lifecycle for a version has expired or if more than two updates have been released since then. Then, customers must update to a supported version.

All releases are listed in the Microsoft Teams Rooms release notes.

Windows 10 release support

Microsoft Teams Rooms requires the Windows 10 IoT Enterprise or Windows 10 Enterprise SKUs under Semi-Annual Channel servicing options. These other Windows 10 editions aren't supported:

- Windows 10 Enterprise Long-term Servicing Branch (LTSB) / Long Term Servicing Channel (LTSC) editions
- Windows 10 Internet of Things (IoT) Enterprise LTSB / LTSC editions
- any other edition of Windows such as Windows 10 Pro or Home edition

A Windows 10 feature update isn't offered or updated on Microsoft Teams Rooms devices immediately. An intentional delay of up to six months after the general availability date published on the Windows 10 release information page. The delay time is used to validate the Windows 10 release compatibility for the Microsoft Teams Rooms application, device hardware, and certified audio video peripherals. Validation begins and continues during active development of each major release of Windows 10. Extra time is needed to validate that all device manufacturers have built updated images for their devices, and for Microsoft Teams to certify and test those images. During the validation period, the Microsoft Teams Room app uses Windows Update for Business group policies to delay Windows 10 feature updates. After any compatibility issues are found and resolved, the block is lifted via updating group policies through a new app release in Windows store. Devices that run the Microsoft Teams Rooms app automatically update to an appropriate Windows 10 release during the nightly maintenance reboot. An MSI version is made available for customers that wish to manually manage updates.

IMPORTANT

During the validation period, Microsoft Teams Rooms devices should **not** be updated to the next release of Windows 10 by any means. This includes overriding the group policies in place, or using System Center or other third-party device management services. Any of these may cause issues for the Microsoft Teams Room application or may leave devices unusable.

The following table shows recommended and supported versions of Windows 10 that are verified to support Microsoft Teams Rooms. All dates are listed in ISO 8601 format: YYYY-MM-DD.

VERSION	AVAILABILITY DATE	MICROSOFT TEAMS ROOMS SUPPORT STATUS	MICROSOFT TEAMS ROOMS MINIMUM APPLICATION VERSION	RECOMMENDED OS BUILD
20H2	2020-10-20	Under validation, Not supported yet	—	19042.572
2004	2020-05-27	Skipped, Not recommended	—	19041.264
1909	2019-11-12	Supported, Recommended	4.5.33.0	18363.418
1903	2019-05-21	Supported	4.2.4.0	18362.356
1809	2019-03-28	Not Supported, Known compatibility issues ①	—	—
1803	2018-07-10	Not Supported	—	—
1709	2018-01-18	Not supported	—	—
1703	2017-07-11	Not Supported	—	—

① Windows 10 version 1809 is not recommended due to compatibility issues found with the Microsoft Teams Rooms application. This specific issue causes the Microsoft Teams Rooms application to fail to start after the nightly reboot. This issue was addressed in Windows 10 version 1903.

② Windows 10 version 2004 is not recommended due to compatibility issues found with the Microsoft Teams Rooms application. This specific issue causes the Microsoft Teams Rooms application to fail to start after the nightly reboot.

When you use a supported version of Windows 10, you will always get the latest application updates for the Microsoft Teams Rooms app.

Related topics

Microsoft Teams Rooms help

Microsoft Teams Rooms release notes

Plan for Microsoft Teams Rooms

Release notes

11/2/2020 • 9 minutes to read • Edit Online

This article discusses cumulative improvements in Microsoft Teams Rooms.

Version history

RELEASE	PUBLISHED TO MICROSOFT STORE
4.6.23.0	10/19/2020
4.6.20.0	09/30/2020
4.5.37.0	08/14/2020
4.5.35.0	07/23/2020
4.4.63.0	06/25/2020
4.4.41.0	05/06/2020
4.4.25.0	03/31/2020
4.3.42.0	03/02/2020
4.3.33.0	1/10/2020
4.3.23.0	12/13/2019
4.2.4.0	10/07/2019
4.1.22.0	08/15/2019
4.0.105.0	07/10/2019
4.0.85.0	04/08/2019
4.0.78.0	03/14/2019
4.0.76.0	03/04/2019
4.0.64.0	12/14/2018
4.0.51.0	11/17/2018
4.0.31.0	10/16/2018
4.0.27.0	10/1/2018

RELEASE	PUBLISHED TO MICROSOFT STORE
4.0.19.0	08/31/2018
4.0.18.0	08/27/2018
4.0.8.0	07/06/2018
3.1.115.0	06/18/2018
3.1.113.0	06/13/2018
3.1.112.0	06/05/2018
3.1.104.0	04/16/2018
3.1.100.0	03/16/2018
3.1.99.0	3/14/2018
3.1.98.0	3/8/2018
3.0.16.0	11/27/2017
3.0.15.0	10/3/2017
3.0.12.0	9/1/2017
3.0.8.0	11/16/2017
3.0.6.0	11/16/2017
2.0.2.0	03/15/2017
RTM (1.0.8)	12/7/2016

Microsoft Teams Rooms feature introduction and issue resolution

4.6.23.0 (10/19/2020)

Introduced in this update:

- Fix for white half-screen when invoking On-screen keyboard in Teams meeting

4.6.20.0 (09/30/2020)

Introduced in this update:

- See more videos with 3x3 video gallery on front of room displays
- Start local live closed captions from MTR
- Join Zoom meetings from Teams Rooms with direct guest join (Preview)

> **NOTE**
> 3x3 video gallery and local live closed captions are delivered through Microsoft Teams service. These features are available to all Teams Rooms with application version 4.5.37.0 and above.

4.5.37.0 (08/14/2020)

Introduced in this update:

- Coordinated Meetings between Microsoft Teams and Surface Hub 2S
- Fix for Skype For Business sign in failure when Windows 10 update KB4565351 or Windows 10 update KB4571709 is installed

4.5.35.0 (07/23/2020)

Introduced in this update:

- Join Cisco WebEx meetings from Teams Rooms with direct guest join
- Teams Admin Center enablement and auto-enrollment
- Windows 10 1909 release support
- Switch to video gallery layout even when content is present
- Virtual raise hands support for attendee and controls for presenter
- Adjustable default volume setting for conferencing and default speaker
- Search and call federated users (tenant) from Teams Room

> **IMPORTANT**
> Version 4.5 is last release to support Windows 10 version 1803; future releases will not be offered to systems on Windows 10 version 1803. For more information about Windows version support, see Windows 10 release support.

4.4.63.0 (06/25/2020)

Introduced in this update:

- Quality and reliability fixes
- Fix for "application won't launch after update to 4.4.41.0" issue

> **NOTE**
> If your device doesn't automatically update to version 4.4.63.0, follow the steps in Microsoft Teams Rooms application does not start after updating to version 4.4.41.0 to resolve the issue.

4.4.41.0 (05/06/2020)

Introduced in this update:

- Reliability fixes for application start in Windows 10 Kiosk

4.4.25.0 (03/31/2020)

Introduced in this update:

- Modern authentication support for Exchange and Skype for Business
- Support for dynamic emergency calling for Teams (Service components required and released using Teams client rings)
- Ability to disable duplicate content out of meeting for dual displays rooms using XML
- Application splash screen

- Open Source Software (OSS) notices in device settings

4.3.42.0 (03/02/2020)

Introduced in this update:

- Policy updates for "Windows Updates for Business"
- Fix for device events reporting showing error in Azure Monitor

4.3.33.0 (1/10/2020)

Introduced in this update:

- A fix for a Window resizing/flickering issue that's seen in certain configurations
- Calendar processing for third-party meetings removed
- Cortana status setting removed

4.3.23.0 (12/13/2019)

Introduced in this update:

- Auto-answer proximity based calls and admin setting to control this
- Device Admin Settings UI refresh with addition of device configuration under About tab
- Room control back to main screen
- Meeting Room SKU available in GCC
- Content camera support for Surface Pro-based system (Minimum required app build: 4.2.4.0)

4.2.4.0 (10/07/2019)

Introduced in this update:

- Windows 10 1903 support. Windows 10 1903 update is offered in a few days after app update
- Fixes for On-screen keyboard not showing up reliably

4.1.22.0 (08/15/2019)

Introduced in this update:

- A new content camera feature that enables users to intelligently include a traditional whiteboard into their Teams meeting
- Additional improvements to the Console UI to reduce clutter and moved Settings into a new side bar that is accessed via More on the console
- Disabled share tray button if local content cable is not connected or a content camera is not connected
- Fixed an issue with the touch keyboard where it failed appear the first time only after a MTR system restart
- Quality and reliability fixes

4.0.105.0 (07/10/2019)

Introduced in this update:

- Skype Room System store app rebrand to "Microsoft Teams Rooms"
- Microsoft Teams Rooms console user interface realigned to Microsoft Teams
- Theme update: only keep custom background image on front of room displays, while making console background a neutral color to ensure console UI controls meet color contrast — accessibility requirements
- Universal bar for in-meeting call controls for Teams calls/ meetings to provide consistent experience with Microsoft Teams PC/ Web/ Mobile clients[1]
- Call quality feedback rating after Teams calls/ meetings[1]
- Recieve/ render Microsoft Whiteboard on Microsoft Teams Rooms front of room display when shared from PC/ Web/ Mobile Teams client[1] [2]
- Removed support for Windows 10 Version 1809 upgrades due to compatibility issues with Microsoft Teams

Rooms client. Windows 10 Version 19H1 support will be added in future releases

[1] Microsoft Teams service rollout using Teams rings. This feature may be available earlier or later than 4.0.105.0 client update

[2] Requires IT admins to turn on Microsoft Whiteboard. Also, if you have a touch-enabled front of room display, you must calibrate multiple touch displays using Windows settings with device administrator login to start using Microsoft Whiteboard for collaboration from a room display shared into a Teams meeting

4.0.85.0 (04/8/2019)

Introduced in this update:

- Fixes an issue with the "give feedback" feature
- Optimizations in preparation for the forthcoming Microsoft Teams Rooms device upgrade to Windows 10 Version 1809

4.0.78.0 (03/14/2019)

Introduced in this update:

- Fix for "hang at app start-up" bug that affected devices on legacy Windows 10 RS2 build.

4.0.76.0 (03/04/2019)

Introduced in this update:

- DTMF keypad for Microsoft Teams P2P meetings and PSTN calls. To make Microsoft Teams your default calling client, admins must set IsTeamsDefaultClient to true
- Pin a remote participant's incoming video to full screen on front of room display. Use "Pin" command from participant roster on the console
- Improvements to Lobby notifications with addition of Front of Room notification
- Front of Room display casting icon removed when Bluetooth beacon is not enabled on Microsoft Teams Rooms device
- Fix for volume control issue in Teams meetings

4.0.64.0 (12/14/2018)

Introduced in this update:

- Display content on both Front of Room (FoR) displays on dual screen room systems
- Theming and Front of Room user interface improvements
- TLS 1.2 client-side support. For on-premise customers, enabling communication over TLS 1.2 for Microsoft Teams Rooms requires Skype for Business Server 2015 Cumulative Update 9 (CU9) or Skype for Business Server 2019 Cumulative Update 1 (CU1).

4.0.51.0 (11/17/2018)

Introduced in this update:

- Dual display (Front of Room) support for Teams Meetings

4.0.31.0 (10/16/2018)

Introduced in this update:

- Quality and reliability fixes

4.0.27.0 (10/1/2018)

Introduced in this update:

- Code changes necessary to prepare the Microsoft Teams Rooms app for later Windows 10 Version 1803 upgrade

- Fix formatting issue with localized EULAs (specifically Norwegian) which prevents advancing beyond EULA OOBE setup window
- Code changes required to make Microsoft Teams Rooms application run on legacy Lync Room Systems. See more here.

4.0.19.0 (8/31/2018)

Introduced in this update:

- Hotfix for Crestron application not launching which would normally be accessible when the app button on a Crestron SR device is pressed. Microsoft Teams Rooms app restart required after installation of 4.0.19.0.

4.0.18.0 (08/27/2018)

Introduced in this update:

- "Report a Problem" feature improvements in Teams mode (equivalent of "Give Feedback" in Skype for Business mode)
- Enable ability to fall back from Teams to Skype for Business mode for SIP calls
- Accessibility improvements (Narrator, Magnifier)
- Automatically restart app when required after XML provisioning changes have been applied
- Miscellaneous fixes

4.0.8.0 (07/06/2018)

Introduced in this update:

- This update enables both Skype for Business *and* Teams meetings support on Room Systems devices. Teams is turned off by default once the update is applied. Admins can enable Teams locally in device settings or via a remote xml push.

3.1.115.0 (06/18/2018)

Introduced in this update:

- Fix to address error observed on some systems during app launch.

3.1.113.0 (06/13/2018)

Introduced in this update:

- Changes enabling Microsoft to more flexibly manage Windows Updates.
- No change to end-user experience.

3.1.112.0 (06/05/2018)

Introduced in this update:

- Fix to address console responsiveness issues observed on Surface Pro 2017-based devices connected to two front-of-room displays and video ingest
- Automated check to ensure that system is running latest provisioning script

3.1.104.0 (04/16/2018)

Introduced in this update:

- Fix to improve OSK (on-screen keyboard) behavior in Window 10 Version 1709-based systems
- Improvements to prepare for future operating system updates

3.1.100.0 (03/16/2018)

Introduced in this update:

- Application updated to improve telemetry

3.1.99.0 (03/14/2018)

Introduced in this update:

- Fixes an issue where intermittent meeting join issues may occur
- Fixes an issue known to result in a device "hang" experience

3.1.98.0 (3/8/2018)

Introduced in this update:

- Bug/Crash fixes to improve stability
- Support for variable-sized console
- Peripheral audio processing offloading (additional media whitelisting)
- Optimizations that enable IT Pros to build do-it-yourself images with Windows 10 Version 1709 January Update and later.

3.0.16.0 (11/27/2017)

Introduced in this update:

- Fixes an issue with the "Give Feedback" feature.

3.0.15.0 (10/3/2017)

Introduced in this update:

- Support for Polycom MSR Series dock hardware
- Support for the Logitech Brio
- Resolves an issue where displays (console and front-of-room) fail to enter sleep mode when there is no activity in the room

3.0.12.0 (9/1/2017)

Introduced in this update:

- Runs on a Surface Pro (2017) tablet
- Supports Windows 10 Enterprise Creator's Update (English language, build 1703)
- Support for Crestron SR dock hardware
- OEM Support for Environment Controls (Crestron)

The 64-bit version of Windows 10 Enterprise Anniversary edition (English language, version 1607) is no longer supported as of Microsoft Teams Rooms release 3.0.12.0 (update 3).

3.0.8.0 (8/4/2017)

Introduced in this update:

- Resolves issues observed when searching for federated users through the Participants search field. Previous to this fix, search results for external federated users may not have resolved correctly and instead returned incorrect results.

3.0.6.0 (7/7/2017)

Introduced in this update:

- Dual-Screen support (for legacy system parity)
- Themes (built-in themes and the ability to set custom theme)
- Ability to Give Feedback for public builds
- Improved Telemetry around meeting join reliability
- Improved OMS reporting
- Ability for IT Admin to configure devices remotely

2.0.2.0 (03/15/2017)

Introduced in this update:

- In-app user selection of meeting room audio and video USB devices
- Integrated room console status reporting for customers using Microsoft Operations Management Suite, now Azure Monitor

Release to Market (12/7/2016)

Feature(s):

Built for Skype for Business

- One-touch join of Skype Meetings
- Skype Meeting experience optimized for rooms with screen-filling HD video and HD wide-band audio
- All participants can connect to the Skype Meeting using their device of choice from wherever they may be located
- Invite people from your directory where you can instantly see their availability or via a phone call
- Supports Skype for Business PSTN Conferencing and PSTN Calling to replace the stand-alone conference phone in your room

Transform Any Meeting Room

- Dedicated Skype Meeting app optimized for center of table touch controller and large front of room display
- Reuse existing investments in your front of room display or projectors
- Works in all types of meeting spaces from huddle spaces to large conference rooms
- Certified Skype for Business audio and video devices are available for various room sizes
- Built-in wired ingest for to project desktop sharing to the room and to the Skype Meeting

Easy to Deploy, Simple to Manage

- Always-on appliance that automatically wakes up the displays when it detects people in the room
- Simple deployment and updating of the UWP (Universal Windows Platform) Skype Meeting App
- Windows AppLocker locks down the device to the Skype Meeting app
- Monitored and managed as a Windows 10 Enterprise device via Intune and Configuration Manager (MDM)
- Enterprise-grade reliability
- Low training effort of end-users due to familiar Skype user interface
- Runs on Surface Pro 4 tablet

See also

Microsoft Teams Rooms help

Prepare your environment

Support for Microsoft Teams Rooms Current Branch versions

Known issues

Plan for Microsoft Teams Rooms

Manage Microsoft Teams Rooms

Prepare your environment

7/30/2020 • 7 minutes to read • Edit Online

This section contains an overview of the steps required to prepare your environment so that you can use all of the features of Microsoft Teams Rooms.

1. Prepare a device account for each Microsoft Teams Rooms console. See Deploy Microsoft Teams Rooms for details.
2. Ensure that there is a working network/Internet connection for the device to use.
   - It must be able to receive an IP address using DHCP. (Microsoft Teams Rooms cannot be configured with a static IP address at the first unit startup, but afterwards static IP for the device could be configured on the device or on the upstream switch or router.)
   - It must have these ports open (in addition to opening the normal ports for media):
   - HTTPS: 443
   - HTTP: 80
   - If your network runs through a proxy, you'll need the proxy address or script information as well.

     IMPORTANT

     Microsoft Teams Rooms does not support proxy authentication as it may interfere with regular operations of the room. Ensure that Microsoft Teams Rooms have been exempted from proxy authentication before going into production.
3. In order to improve your experience, Microsoft collects data. To allow Microsoft to collect data, allow these sites:
   - Telemetry client endpoint: https://vortex.data.microsoft.com/
   - Telemetry settings endpoint: https://settings.data.microsoft.com/

Create and test a device account

A *device account* is an account that the Microsoft Teams Rooms client uses to access features from Exchange, like calendar, and to enable Skype for Business. See Deploy Microsoft Teams Rooms for details.

Check network availability

In order to function properly, the Microsoft Teams Rooms device must have access to a wired network that meets these requirements:

- Access to your Active Directory or Azure Active Directory (Azure AD) instance, as well as your Microsoft Exchange and Skype for Business servers.
- Access to a server that can provide an IP address using DHCP. Microsoft Teams Rooms cannot be configured with a static IP address at the first unit startup.
- Access to HTTP ports 80 and 443.
- TCP and UDP ports configured as described in Port and protocol requirements for servers for on-premise Skype for Business Server implementations, or Microsoft 365 and Office 365 URLs and IP address ranges for Microsoft Teams or Skype for Business online implementations.

IMPORTANT

Be sure to use a wired 1 Gbps network connection to assure you will have the needed bandwidth.

NOTE

Software updates for Microsoft Teams Rooms are automatically downloaded from the Microsoft Store for Business. See Prerequisites for Microsoft Store for Business and Education to verify that the room console will be able to access the store and self-update.

Certificates

Your Microsoft Teams Rooms device uses certificates for Exchange Web Services, Microsoft Teams or Skype for Business, network usage, and authentication. If the related servers use public certificates, which is the case for Online and some On-Premises deployments, there should be no further action required on the part of the admin to install certificates. If, on the other hand, the certificate authority is a private CA (typical for On-Premises deployments) then the device needs to trust that CA which means having the CA + CA chain certificates installed on the device. Adding the device to the domain may perform this task automatically.

You will install certificates the same way you would for any other Windows client.

NOTE

Certificates may be required in order to have Microsoft Teams Rooms use Skype for Business Server.

Proxy

Microsoft Teams Rooms is designed to inherit Proxy settings from the Windows OS. Access the Windows OS in the following manner:

1. In the Microsoft Teams Rooms UI, click on the Settings gear icon where you'll be prompted for the local Administrator password on the device (the default password is **sfb**).
2. Tap on **Settings** followed by tapping on the **Go to Windows** button and then tapping on the **go to Admin Sign In** button and then clicking the **Administrator** button (if the computer is domain joined choose **Other User,** then use .\admin as the user name).
3. In the **Search Windows** box bottom left type in regedit (either long press the screen or right click and choose **Run as administrator**).
4. Click on the HKEY_USERS folder (you'll see a list of machine user SIDs) ensure the root folder HKEY_USERS is selected.
5. Click on File and then choose **Load Hive.**
6. Browse the to the **C:\Users\Skype** folder and type in the File name box NTUSER.dat and press the open button
7. You'll be prompted for a Key Name for your newly loaded Hive; type in Skype (you should now see the registry settings for the Skype User).
8. Open the Skype key and browse to HKEY_USERS\Skype\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings then ensure these settings are entered:

```
[HKEY_USERS\Skype\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings]
```

```
"MigrateProxy"=dword:00000001
```

```
"ProxyEnable"=dword:00000001
```

```
"ProxyServer"="xx.xx.xx.xx:8080"
```

If ProxyServer doesn't exist you may have to add this key as a string, change the xx.xx.xx.xx:8080 to the ip/host and port of your Proxy server.

9. Once you are finished making your changes highlight the Skype User key (root folder for Skype) and choose unload Hive from the Registry file menu (you'll be prompted for confirmation - select **Yes**).
10. You can now close the registry editor and type logoff into the Windows search box.
11. Back at the sign-in screen, choose the **Skype** user. If all the previous steps were successful, the Microsoft Teams Rooms device will sign-in successfully.

To use this application, you must be able to connect to the endpoints described below. To see the IP addresses, expand the IP address section below the table describing the traffic flow.

Firewall Proxy Host Name/Port Examples

PURPOSE	SOURCE OR CREDENTIALS	SOURCE PORT	DESTINATION	CDN	EXPRESSROUTE FOR OFFICE 365	DESTINATION IP	DESTINATION PORT
Authentication and identity	See Microsoft 365 and Office 365 authentication and identity						
Portal and shared	See Microsoft 365 admin center and shared						
SIP Signaling	Client Computer or Logged on user	Ephemeral ports	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 443
Persistent Shared Object Model (PSOM) connections web conferencing	Client Computer or Logged on user	Ephemeral ports	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 443
HTTPS downloads	Client Computer or Logged on user	Ephemeral ports	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 443

PURPOSE	SOURCE OR CREDENTIALS	SOURCE PORT	DESTINATION	CDN	EXPRESSROUTE FOR OFFICE 365	DESTINATION IP	DESTINATION PORT
Audio	Client Computer or Logged on user	TCP/UDP 50,000-50019	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 443, UDP 3478, TCP/UDP 50,000-59,999
Video	Client Computer or Logged on user	TCP/UDP 50,020-50039	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 443, UDP 3478, TCP/UDP 50,000-59,999
Desktop Sharing	Client Computer or Logged on user	TCP/UDP 50,040-50059	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 443, 50,000-59,999
Lync Mobile push notifications for Lync Mobile 2010 on iOS devices. You don't need this for Android, Nokia Symbian or Windows Phone mobile devices.	Client Computer or Logged on user	Ephemeral ports	*.contoso.com	No	Yes	Skype for Business IP ranges	TCP 5223
Skype Telemetry	Client Computer or Logged on user	Ephemeral ports	skypemaprdsitus.trafficmanager.net pipe.skype.com	No	No	N/A	TCP 443
Skype client quick tips	Client Computer or Logged on user	Ephemeral ports	quicktips.skypeforbusiness.com	No	No	N/A	TCP 443

NOTE

The wildcard for contoso.com and broadcast.skype.com represents a long list of nodes that are exclusively used for Microsoft 365 or Office 365.

Create provisioning packages

You will use provisioning packages to authenticate to Exchange Server, Microsoft 365, or Office 365.

Admin group management

After domain joining, you can use Group Policy or the Local Computer Management to set a Security Group as local administrator just like you would for a Windows PC in your domain. Anyone who is a member of that security group can enter their credentials and unlock Settings.

> **NOTE**
> If your Microsoft Teams Rooms device loses trust with the domain (for example, if you remove the Microsoft Teams Rooms from the domain after it is domain joined), you won't be able to authenticate into the device and open up Settings. The workaround is to log in with the local Admin account.

Local accounts

Microsoft Teams Rooms Local User Account

The Device Account does not typically use a password. It is possible to give it a password, but there are consequences, including a possibility that users might get locked out of the console application when that password expires. Consequently, the administrator should take are to ensure that the password is not allowed to expire.

"Admin" - Local Administrator Account

Microsoft Teams Rooms default password is set to "sfb". The Password can be changed locally by going to Windows Settings > Go to Windows or in the AutoUnattend.xml file (use the Windows System Image manager from ADK to make the change to the xml file).

Caution

Be sure to change the Microsoft Teams Rooms password as soon as possible.

You can also manage the Local Administrator password by setting up a group policy where domain admins are made local admins.

The Local admin password is not included as a choice during Setup.

Machine Account

Much like any Windows device, the Machine Name can be renamed by right clicking in Settings > About > Rename PC.

If you would like to rename the computer after joining it to a domain, use the Rename-Computer PowerShell command followed by the computer's new name.

Related topics

Plan Microsoft Teams Rooms

Microsoft Teams Rooms requirements

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Prerequisites for Microsoft Store for Business and Education

Microsoft Teams Rooms requirements

12/5/2020 • 9 minutes to read • Edit Online

Microsoft Teams Rooms scale to different room sizes by using a wide variety of certified audio and video peripherals based on the size and use of the room. By selecting the right core device and console, combined with microphones, speakers, cameras, and displays appropriate for the space, you can deploy Microsoft Teams Rooms into spaces of any size from very small huddle spaces up through very large conference spaces and boardrooms. The full set of all available certified audio and video peripherals that may be used to configure your room is available in the Device Showcase.

This article summarizes the device deployment and configuration requirements for supporting Microsoft Teams Rooms.

Your deployment involves account creation as described in Deploy Microsoft Teams Rooms and set up of meeting consoles as described in Configure a Microsoft Teams Rooms console.

Also, refer to:

- Skype for Business add-on licensing
- License options based on your plan: Microsoft Teams Rooms

> **NOTE**
>
> Microsoft Teams Rooms sign in to Microsoft Teams, Skype for Business Server 2019, Skype for Business Server 2015, or Skype for Business Online, and may join meetings hosted by any of these services.
>
> Earlier platforms like Lync Server 2013 are not supported by Microsoft Teams Rooms. Microsoft Teams Rooms is not supported in Microsoft 365 or Office 365 operated by 21Vianet, or in GCC-High, or DoD environments.
>
> If you have an on-prem Exchange server, Microsoft Teams Rooms requires the use of Exchange Server 2013 SP1 or later.

Hardware requirements

A hardware deployment includes a selection of a Microsoft Teams Room system, combined with certified audio and video peripherals, and a cabling solution to integrate these devices together. These options are described here.

Supported Microsoft Teams Room systems

All current Microsoft Teams Room devices and bundles are available in the Room Systems product showcase.

CONSOLE	PROCESSOR	RAM	DISK
Crestron Flex UC-M130-T with Intel NUC	Core i5	8 GB	128 GB
Crestron Flex UC- B130-T with Intel NUC	Core i5	8 GB	128 GB
Crestron Flex UC-B140-T with Intel NUC	Core i5	8 GB	128 GB

CONSOLE	PROCESSOR	RAM	DISK
Crestron Flex UC-C140-T with Intel NUC	Core i7	8 GB	128 GB
Crestron Flex UC-M150-T with Intel NUC + CCS-UCA-MIC	Core i7	8 GB	128 GB
Crestron Flex UC-MX150-T with Intel NUC	Core i5	8 GB	128 GB
Crestron Flex UC-B160-T with Intel NUC	Core i7	8 GB	128 GB
Crestron Flex UC-C160-T with Intel NUC	Core i7	8 GB	128 GB
Dell OptiPlex 7080 with Logitech TAP	Core i5 & i7	8 GB	128 GB
HP Elite Slice for Meeting Rooms G2	Core i5	8 GB	128 GB
HP Elite Slice G2 Audio Ready with Microsoft Teams Rooms	Core i5	8 GB	128 GB
HP Slice Partner Ready with Logitech TAP	Core i5	8 GB	128 GB
Lenovo ThinkSmart Hub 500	Core i5	8 GB	128 GB
Lenovo ThinkSmart Hub	Core i5	8 GB	128 GB
Logitech Tap with Intel NUC	Core i5	8 GB	128 GB
Logitech Tap and Lenovo Think Center M920 Tiny	Core i5	8 GB	128 GB
Poly G10-T with Lenovo Think Center M920 Tiny	Core i5	8 GB	128 GB
Yealink MVC300 with Intel NUC	Core i5	8 GB	128 GB
Yealink MVC500 with Intel NUC	Core i5	8 GB	128 GB
Yealink MVC800 with Intel NUC	Core i5	8 GB	128 GB
Yealink MVC900 with Intel NUC	Core i5	8 GB	128 GB

CONSOLE	PROCESSOR	RAM	DISK
Yealink MVC 300 II	Core i5	8 GB	128 GB
Yealink MVC400	Core i5	8 GB	128 GB
Yealink MVC 500 II	Core i5	8 GB	128 GB
Yealink MVC 800 II	Core i5	8 GB	128 GB
Yealink MVC 900 II	Core i5	8 GB	128 GB

NOTE

- Core M3 processors are not supported.
- You need a 32 GB or larger USB drive configured as bootable Windows installation media for Windows 10 Enterprise.

Supported Surface Pro tablets for dock-style systems

TABLET	PROCESSOR	RAM	DISK
Surface Pro 6	Core i5	16 GB or 8 GB	128 GB or more
Surface Pro (fifth Gen)	Core i5	8 GB or 4 GB	128 GB or more
Surface Pro 4	Core i5	8 GB or 4 GB	128 GB or more

- Surface Pro devices require one of the following docking station options:
  - Logitech SmartDock
  - Crestron SR
  - Polycom MSR Series

Certified firmware versions for USB audio and video peripherals

These devices are available at the Room System Accessories product showcase and https://office.com/teamsdevices.

MICROSOFT TEAMS ROOMS PERIPHERAL	CERTIFIED FIRMWARE VERSION	CAMERA SUPPORTS CONTENT CAMERA USE
Aver VC520 Pro Camera + Speakerphone	1004.35	
Aver VB342+ Camera Soundbar	Soundbar: 0.0.0000.97	
Aver CAM 540	0.0.6002.83	
Aver CAM 520 Pro	0.0.1000.73	
Crestron Huddly IQ	1.02.09.33901	
Huddly Canvas	1.3.25	✔

MICROSOFT TEAMS ROOMS PERIPHERAL	CERTIFIED FIRMWARE VERSION	CAMERA SUPPORTS CONTENT CAMERA USE
Huddly IQ	1.3.22	
Huddly IQ Lite	1.3.29	
Huddly IQ Camera	1.3.27	
Jabra Panacast Camera	3.8.22	
Logitech Brio	V2.2.50	✔
Logitech 930e	8.0.914	✔
Logitech Rally	1.2.4	
Logitech MeetUp	Audio — 1.0.172 Video — 1.0.156	
Logitech ConferenceCam Connect	1.1.248.0 1.1.684	
Logitech Group	8.5.778	
Logitech PTZ Pro	1.1.219	
Logitech PTZ Pro 2		
Poly Eagle Eye Cube Camera	1.2.0	
Polycom EagleEye IV	1.0.0	
Polycom CX5100	1.2.0.70232	
Polycom Eagle Eye Director II	2.1.0.10	
Polycom Studio Soundbar	1.1.2.000570	
Polycom Trio 8500 / 8800	5.7.2.3205	
EPOS SP 220 MS	2.0.12.0	
EPOS SP20	1.2.15	
EPOS SP30	2.1.52	
EPOS SP30T	3.2.63	
EPOS Expand 80T	4.4.6	
Jabra 510	2.10.0	

MICROSOFT TEAMS ROOMS PERIPHERAL	CERTIFIED FIRMWARE VERSION	CAMERA SUPPORTS CONTENT CAMERA USE
Jabra 710	1.8.0	
Jabra 810	1.2.23	
Yamaha YVC-1000	100c	
Yealink CP900	100.20.0.29	
Yealink UVC30	105.420.0.11	✔
Shure Intellimix P300 Audio Conferencing Processor+ Shure MXA 310 Table Array Mic	4.1	
Shure Intellimix P300 Audio Conferencing Processor + Shure MXA 910 with Intellimix Ceiling Array Mic	4.1	
Shure Intellimix P300 Audio Conferencing Processor+ Shure MXA 310 Table Array Mic + MXN5W-C Ceiling speaker	P300 DSP: 4.1.11 MXA310 Table Array mic: 4.1.41 MXN5W-C Speaker: 1.0.4	
Shure Intellimix P300 Audio Conferencing Processor + Shure MXA 910 with Intellimix Ceiling Array Mic + MXN5W-C Ceiling speaker	P300 DSP: 4.1.11 MXA910 Ceiling Array mic: 4.1.41 MXN5W-C Speaker: 1.0.4	
Biamp Tesira Fore AVB VT4 Fixed audio DSP+ ‡ Sennheiser TeamConnect Ceiling 2 Microphone+ ‡ Tesira EX-UBT ‡	Biamp DSP: 3.12.0.15 TCC2: 1.3.3 EX-UBT: 3.12.0.15	
Biamp Tesira FORTÉ AVB VT4 Audio DSP+ Biamp Parlé TCM-XA Ceiling Microphone+ Biamp Desono C-IC6 ceiling mounted loudspeaker	Audio FW version: 3.15	
Biamp TesiraFORTE AVB VT4+ Parle TTM-X(Table Mic)+	Audio FW version: 3.15	
Bose ControlSpace EX-440C DSP + Bose P2600A AmpLink Amplifier + Sennheiser TCC2 Ceiling Microphone + Bose EdgeMax EM180 Ceiling Speaker	Bose DSP: 2.290 P2600A : 1.160 TCC2: 1.4.2	

MICROSOFT TEAMS ROOMS PERIPHERAL	CERTIFIED FIRMWARE VERSION	CAMERA SUPPORTS CONTENT CAMERA USE
Bose ControlSpace EX-440C DSP + Bose P2600A AmpLink Amplifier + Sennheiser TCC2 Ceiling Microphone + Bose DesignMax DM2C-P Ceiling Speaker	Bose DSP: 2.290 P2600A : 1.160 TCC2: 1.4.2	
Bose ControlSpace EX-1280C DSP + Bose P2600A AmpLink Amplifier + Sennheiser TCC2 Ceiling Microphone + DesignMax DM2C -LP Ceiling Speaker	Bose DSP: 2.290 P2600A : 1.160 TCC2: 1.4.2	
Bose ControlSpace EX-1280C DSP + Bose P2600A AmpLink Amplifier+ Sennheiser TCC2 Ceiling Microphone + EdgeMax EM180 Ceiling Speaker	Bose DSP: 2.290 P2600A : 1.160 TCC2: 1.4.2	
QSC Q-SYS Core 110f + + QSC EnergyStar Power Amplifier SPA2-60 + Q-SYS NS Series Network Switch NS-1108P + QSC Column Surface mount Speakers AD-S402T	Q-sys Designer: 8.4.0 TCC2 : 1.5.1 Dante 1.2.0 N/A N1100v6.4.2.8 N/A	
QSC Q-SYS Core 110f + + QSC EnergyStar Power Amplifier SPA2-60 + Q-SYS NS Series Network Switch NS-1108P + QSC Column Surface mount Speakers AD-C6T-LP	Q-sys Designer: 8.4.0 TCC2 : 1.5.1 Dante 1.2.0 N/A N1100v6.4.2.8 N/A	

‡ Customers may choose either the Dante interface or the network switch recommended by Biamp/Sennheiser for this bundle.

USB extenders

- USB ports on tablet docks are USB 3.0 compatible. You can use a USB 2.x extender but doing this limits you to USB 2.x speeds on the far end. Extenders are not recommended for USB 3.0 peripherals.
- An extender must meet USB 2.0 or newer specifications.
  - Tablet docks support at least two stages of external USB hub extension. If you connect more than two USB hubs in series, check with the dock manufacturer to confirm whether they support series connection.
  - Wired GbE connection in the room. Ethernet cable of appropriate length.
  - Up to two 1080-p displays with HDMI connections. HDMI cables of appropriate length.

NOTE

A consumer TV used as a front of room display needs to support/enable the Consumer Electronics Control (CEC) feature of HDMI so that it can switch automatically to an active video source from standby mode. This feature is not supported on all TVs.

Microsoft Teams Rooms does not use a keyboard. If needed, the Admin should use the on-screen keyboard. A USB keyboard or mouse will be required when imaging the Microsoft Teams Rooms device.

The following tables provide recommendations for peripherals based on room size:

Microsoft Teams Rooms Certified Audio Peripherals

ROOM TYPE	NUMBER OF PEOPLE	RECOMMENDED MAXIMUM DISTANCE FROM MICROPHONE TO SPEAKER	DEVICE BY MAXIMUM ROOM SIZE	COMMENTS
Focus 10' x 9'	2–4	1.5 m	Logitech Connect	Logitech Connect devices include a camera that must be positioned at the front of the room (not center of table) to capture local meeting attendees.
Small 16' x 16'	4–6	2.0 m	Jabra 510 Sennheiser SP20	Playback volume can be limited for larger rooms.
Medium 18' x 20'	6–12	2.4 m	Jabra 710 Jabra 810 Logitech MeetUp Logitech Group Polycom Trio Polycom CX5100 Sennheiser SP 220 MS Yamaha YVC-1000MS	The Logitech MeetUp includes a camera so it must be positioned at the front of room (not center of table to capture local meeting attendees). In general, rooms with long rectangular or u-shaped tables may benefit from satellite microphones. SP 220 MS must be used in daisy-chain configuration.
Large 15' x 32'	12–16	3 m This distance also applies to the area covered by each connected satellite microphone.	Logitech Group + satellite mics Polycom Trio+ satellite mics Polycom CX5100 + satellite mics Sennheiser SP 220 MS Yamaha YVC-1000MS + satellite mics	All audio devices listed in this row support satellite microphone options. CX5100 includes a built-in 360-degree camera so that the device can be positioned in the center of table. SP 220 MS must be used in daisy-chain configuration.

Microsoft Teams Rooms Certified Video Peripherals

ROOM TYPE	NUMBER OF PEOPLE	DEVICE BY OPTIMAL ROOM SIZE	COMMENTS
Focus 10' x 9'	2–4	Logitech Connect Logitech MeetUp Polycom CX5100	
Small 16' x 16'	4–6	Logitech C930e Logitech MeetUp Logitech BRIO Logitech PTZ Pro Polycom MSR Polycom CX5100	Logitech PTZ Pro often bundled with Logitech Group
Medium 18' x 20'	6–12	Logitech MeetUp Logitech BRIO Logitech PTZ Pro Polycom MSR Polycom CX5100	
Large 15' x 32'	12–16	Logitech PTZ Pro Polycom MSR Polycom CX5100	

NOTE

Front of room display resolution should be set to no greater than 1920x1080p.

Required software downloads

To build your own Microsoft Teams Rooms image, follow the instructions in Configure a Microsoft Teams Rooms console. Those instructions guide you through download of all software necessary for installation.

NOTE

IT professionals will need access to Windows 10 Enterprise ISO files through their volume licensing agreement.

SkypeRoomProvisioningScript.ps1 is an optional download you can use to provision Microsoft Teams Rooms accounts.

See also

Browse All Bundles

Plan for Microsoft Teams Rooms

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Skype for Business add-on licensing

Teams Meeting Room Licensing Update

5/29/2020 • 2 minutes to read • Edit Online

Licensing Solutions for Shared Communication Devices

Microsoft has a dedicated SKU for licensing meetings and calling on a per-device basis for meeting room devices (such as Microsoft Teams Rooms, Microsoft Surface Hub, and collaboration bars for Microsoft Teams).

	MEETING ROOM SKU	
Skype for Business	✔	
Microsoft Teams	✔	
Phone System	✔	
Audio Conferencing	✔ [1]	
Microsoft Intune	✔	
Worldwide Availability	✔ [2]	
Channel Availability	EA, EAS, CSP, Web Direct	

[1] Availability and included minutes may vary by region. To verify service availability, refer to Country and region availability for Audio Conferencing and Calling Plans. Consumption charges may apply for additional services, such as toll-free, international minutes for domestic plans, etc. Customers can disable these features to avoid additional billing.

[2] Not available in sovereign clouds

> **NOTE**
> If you are currently using E1, E3, E4, E5 SKUs with Skype for Business Plan 2 with Audio Conferencing or with Office 365 Phone System and a Calling Plan, these will continue to work. However, you should consider moving to a simpler licensing model in the table above after current licenses expire.

> **IMPORTANT**
> If you are using Skype for Business Plan 2, you can only use the Microsoft Teams Rooms in Skype for Business Only mode, meaning all of your meetings will be Skype for Business meetings. In order to enable your meeting room for Microsoft Teams meetings, we recommend you purchase the Meeting Room license.

The following table lists the features that are available in Microsoft Teams Rooms and what licenses you need to buy to get them.

> **NOTE**
>
> The room that is being set up needs to be a user object and have these licenses assigned to it.

	YOU HAVE MICROSOFT TEAMS OR SKYPE FOR BUSINESS ONLINE HERE'S WHAT YOU NEED TO BUY:	YOU HAVE SKYPE FOR BUSINESS SERVER 2015/2019 (ON-PREMISES OR HYBRID). HERE'S WHAT YOU NEED TO BUY:
Join a scheduled meeting	Meeting Room SKU	Skype for Business Server Standard CAL
Initiate an ad hoc meeting	Meeting Room SKU	Skype for Business Server Standard CAL Skype for Business Server Enterprise CAL
Initiate an ad hoc meeting and dial out from a meeting to phone numbers	Meeting Room SKU	Skype for Business Standard CAL Skype for Business Server Enterprise CAL
Give the room a phone number and make or receive a calls from the room or join an audio conference using a phone number	With Direct Routing: Meeting Room SKU Without Direct Routing: Domestic or International Calling Plan Microsoft 365 Business Voice	Skype for Business Server Standard CAL Skype for Business Server Plus CAL
Manage your room device with Microsoft Intune	Meeting Room SKU	Microsoft Intune subscription with on-premises MDM

> **NOTE**
>
> If you have existing licenses assigned for room systems, these will continue to work without any interruption. You should move to use the new Meeting Room SKU when existing licenses expire.

Use the right version of Windows 10: For customers who want to deploy Windows 10 images to their devices, see Configure a Microsoft Teams Rooms console. You can get a copy from the Volume Licensing Service Center.

Plan Microsoft Teams Rooms management with Azure Monitor

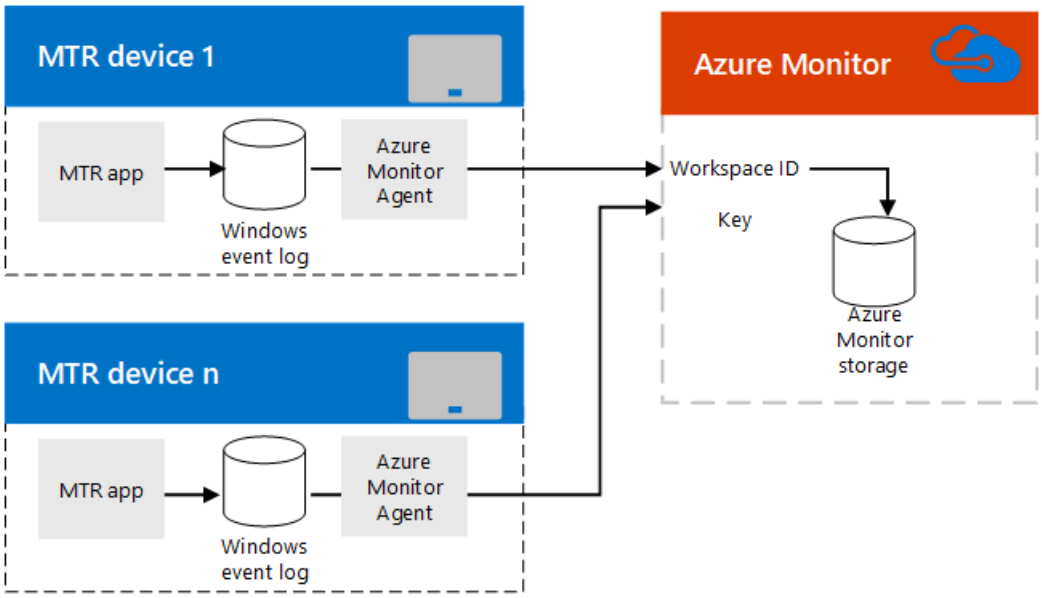
4/3/2020 • 2 minutes to read • Edit Online

This article discusses planning considerations for using Azure Monitor to administer Microsoft Teams Rooms devices in your Microsoft Teams or Skype for Business implementation.

Azure Monitor is a collection of management services that were designed in the cloud from the start. Rather than deploying and managing on-premise resources, Azure Monitor components are entirely hosted in Azure. Configuration is minimal, and you can be up and running literally in a matter of minutes. With some customization work, it can aid in managing Microsoft Teams Rooms conferencing systems by providing real-time notifications of system health or faults for individual room systems, and it can potentially scale up to managing thousands of Microsoft Teams Rooms conference rooms.

This article provides a discussion of the requirements, design/architecture, and implementation best practices needed to implement Azure Monitor based management of Microsoft Teams Rooms conference devices, and provides links to detailed articles on implementing Azure Monitor for Microsoft Teams Rooms and critical reference information for ongoing monitoring of Microsoft Teams Rooms rooms.

Functional overview



The Microsoft Teams Rooms app on the console device writes events to its Windows Event Log. A Microsoft Monitoring agent, once installed, passes the information to Azure Monitor service.

Once properly configured, Log Analytics parses the JSON payload embedded in the event descriptions to describe how each Microsoft Teams Rooms system is functioning and what faults are detected.

An administrator using Azure Monitor can get notifications of Microsoft Teams Rooms systems that are offline or are experiencing app, connectivity, or hardware failures as well as knowing if a system needs to be restarted. Each system status is updated frequently, so these notifications are close to real-time updates.

Azure Monitor requirements

You must have a valid Azure subscription for Azure Monitor to use Log Analytics feature. See Get started with a

Log Analytics workspace to create a subscription for your organization.

You should familiarize yourself as necessary on how to use the Log Analytics View Designer. See Views in Log Analytics for those details.

Related Tasks

1. Once subscribed to Azure Monitor Log Analytics, create custom fields (as described in Map custom fields) needed to parse the information that will be sent from Microsoft Teams Rooms consoles. This includes understanding the JSON schema documented in Understand the log entries.
2. Develop a Microsoft Teams Rooms management view in Log Analytics. You can either Create a Microsoft Teams Rooms dashboard by using the import method or Create a Microsoft Teams Rooms dashboard manually.

Individual Microsoft Teams Rooms Console requirements

Each Microsoft Teams Rooms console is an app running on a Surface Pro device in kiosk mode (normally, it's configured to be the only app that can run on the device). As with any Windows app, the Microsoft Teams Rooms app writes events like startup and hardware faults to the Windows Event Log. Adding an Microsoft Monitor agent on your Microsoft Teams Rooms device allows these events to be collected. (See Connect Windows computers to the Log Analytics service in Azure for details.)

Ongoing management

While using Azure Monitor to manage your Microsoft Teams Rooms devices, you'll need to understand the information contained in the event logs used by Azure Monitor. See Understand the log entries for details on these health messages.

Related Tasks

- Understand the Alerts generated by Microsoft Teams Rooms and how to resolve them (see the section titled Understand the log entries)

See also

Deploy Microsoft Teams Rooms management with Azure Monitor

Manage Microsoft Teams Rooms devices with Azure Monitor

Microsoft Teams Rooms managed service

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The Microsoft Teams Rooms managed service is a cloud-based IT management and monitoring service that keeps Microsoft Teams Rooms devices and their peripherals up to date and proactively monitored, supporting an environment optimized for a great user experience.

The Microsoft Teams Rooms managed service is for organizations looking to improve their meeting room experience and rapidly scale their footprint by offering proactive management for Microsoft Teams Rooms devices. The service allows organizations to save time, money, and expertise that would otherwise be spent on "do it yourself" room management.

The Microsoft Teams Rooms managed service is built on a strong foundation of Microsoft's expertise in software-enabled management of end points, machine learning, and intelligent automation. The Microsoft Teams Rooms managed service helps organizations deliver a high-quality experience across multiple remote sites and can accommodate any pace of growth an organization might require.

Service capabilities

Here's an overview of the capabilities of the Microsoft Teams Rooms managed service.

CAPABILITIES	DESCRIPTION
Room planning and rollout	Room planning capabilities that allow you to understand your room equipment inventory and make decisions on equipment standards for new room deployments.
Monitoring and troubleshooting	Room health monitoring that detects problems with the room system and peripherals and provides a proactive incident management response driven by Microsoft.
Update management	Management and delivery of application and firmware updates for room systems and their peripherals performed by Microsoft.
Insights and recommendations	Insights into customer health, usage, utilization, and equipment reliability.
Compliance and certifications	Meets all applicable standards for Microsoft Online Services.
Customer support	24x7x365 ticket support through the dedicated Microsoft Teams Rooms managed service Service Operation Center (SOC). Escalation on your behalf to other primary vendors when applicable. To learn more, see Customer support.
Supported devices	Certified Microsoft Teams Rooms systems and their peripherals.
Supported regions	See Supported regions.
Integration	Available integration with customer-hosted Service Now.

Service features

Here's a summary of important features the Microsoft Teams Rooms managed service provides to support the above capabilities.

FEATURE	DESCRIPTION
Inventory management	Room inventory tracking with a bulk export option that lists room devices, peripherals, makes, and models.
Room enrollment	Easy onboarding with self-enrollment of room devices to the Microsoft Teams Rooms managed service.
Room administration	Customer portal for managed service capabilities, insights, administrative settings, and room group management.
Monitoring	Application, operating system, peripheral and firmware health monitoring. Automated incident detection for issues affecting meeting experiences due to issues such as peripheral health. Health overview of the entire room real estate and incidents through the Microsoft Teams Rooms managed service portal.
Troubleshooting and remediation	Automated diagnostics and auto-remediation where applicable. Microsoft Teams Rooms managed service SOC-assisted incident remediation for non-automated cases. Service Now integration for incident coordination.
Update management	Automated meeting application and firmware update orchestration based on customer configurable deployment rings
Insights and recommendations	Usage, incidents, health, and overall reporting (historical views)

Service prerequisites

For the Microsoft Teams Rooms managed service to maintain service quality, enrolled rooms must be Microsoft Teams Rooms supported devices, and you must prepare your environment with all the required Office 365 URLs and IP address ranges fully allowed and reachable by meeting room devices. To learn more, see Prepare your environment in the Microsoft Teams Rooms documentation.

As provider of a managed service, Microsoft needs to work with responsible stakeholders for rooms in your organization to keep rooms healthy and recover from issues. You're responsible for uncertified devices used in meeting rooms, third-party or custom software that you've chosen to deploy in your meeting room devices, and adhering to change management practices recommended by Microsoft.

Your organization or a partner contracted by your organization must be prepared to remediate last mile issues detected by the service.

Customer support

The Microsoft Teams Rooms managed service is supported through a dedicated Microsoft Teams Rooms managed service SOC. The primary mode for communication from the Microsoft Teams Rooms managed service SOC to customers is through the Microsoft Teams Rooms managed service portal. The Microsoft Teams Rooms managed service SOC provides first response and appropriate escalation on tickets raised by the system or by your organization.

Scope	Incidents related to the meeting room app, room devices, and peripherals are included in Microsoft Teams Rooms managed service support.
Audience	IT Operations only
Supported languages	English
Support availability through the portal	24X7
Initial response time for the Microsoft Teams Rooms managed service SOC	4 hours
Automated closure of tickets in cases of customer inactivity	Customer-initiated tickets: 3 business days System-initiated tickets: 15 business days
Redirection to broader Microsoft Support	Issues related to another Microsoft product outside the scope of the Microsoft Teams Rooms managed service are directed to the appropriate support team.
Redirection to Original Equipment Manufacturer (OEM) support	The Microsoft Teams Rooms managed service SOC works to understand the issue and where applicable, helps coordinate support with the OEM. In some cases, you may be responsible for engaging directly with your OEM.

Additionally, keep in mind that the Microsoft Teams Rooms managed service SOC will assist IT Operations in your organization and isn't a replacement for help desk services for your end users.

For more details on the Microsoft Teams Rooms managed service support coverage, see Support inclusions and exclusions.

Supported regions

The Microsoft Teams Rooms managed service is available in the following countries and regions.

- Australia
- Austria
- Belgium
- Canada (excluding Quebec)
- Denmark
- Finland
- Germany
- Greece
- Ireland
- Italy
- Luxembourg
- Monaco
- The Netherlands
- New Zealand
- Norway
- Portugal
- Spain

- Sweden
- Switzerland
- United Kingdom
- United States

Support inclusions and exclusions

WHAT'S INCLUDED	WHAT'S EXCLUDED	SUPPORT CHANNELS FOR EXCLUDED ITEMS
Service configuration		
Investigation and guidance for Microsoft Teams Rooms Windows configuration including Microsoft Teams Rooms app settings, first-party network configuration, first-party software setup, and recommended power settings and configuration.	Any third-party software configurations and investigations that aren't directly part of the Microsoft Teams Room app. Also, any OEM-specific configurations that require configuration outside of first-party windows, or Microsoft Teams Room app settings.	Third-party standard support channels
Room account setup		
Direction to available documentation for room account setup at request. For sign-in or account configuration issues, initial investigation is performed.	Execution of recommended remediation or issues with executing recommended remediation, configuration of third-party authentication providers, and configuration of individual-account features.	Microsoft mainstream support and third-party authentication provider support
Peripheral support		
Initial investigations are performed for certified peripherals such as cameras, microphones, and speakers.	Issues that aren't resolved by applying standard configurations or that involve a third-party application.	OEM support
RMA and device replacement		
Initial investigations are performed for certified peripherals such as cameras, microphones, and speakers. Handoff to OEM support is performed for the OEM to fulfill the replacement or warranty request.	Procurement, shipping, or installation of replacements.	OEM support
Root cause analysis		
All root causes for issues encountered in the meeting room experience are provided when available but are performed on an as-able basis.	Root cause analysis for third-party software issues isn't included.	Third-party standard support channels
Meeting experience		

WHAT'S INCLUDED	WHAT'S EXCLUDED	SUPPORT CHANNELS FOR EXCLUDED ITEMS
Investigating issues within the meeting settings on Microsoft Teams Rooms app and guidance for properly configuring Quality of Service on the device is provided at request.	Root cause analysis or investigations for call-quality issues or network-related issues are excluded from this scope.	Microsoft mainstream support
Remediation, onboarding, and ongoing		
Customers receive guidance to bring their rooms to standards that are recommended by Microsoft Teams Rooms managed service at onboarding	Investigations with respect to in-house custom software images or non-compliant with recommended software version guidance from Microsoft Teams Rooms managed service aren't in scope.	

Data collection

The Microsoft Teams Rooms managed service monitors devices, collects device data, and allows Microsoft to remotely access and manage room devices. The Microsoft Teams Rooms managed service doesn't access the live content of a meeting.

Data collected is specific to a room account, not an individual user. Incidental references to an individual user may be present in the activity log during use of the device. Collected data is processed by Microsoft in accordance with the Microsoft Privacy Statement.

Related topics

- Microsoft Teams Rooms managed service

Role-based access control with the Microsoft Teams Rooms managed service

8/28/2020 • 3 minutes to read • Edit Online

Role-based access control (RBAC) in the Microsoft Teams Rooms managed service helps you manage user access to room resource data in your organization. By assigning roles to your service portal users, you can limit what they can see and change. Each role has a set of permissions that determine what users with that role can access and change within your organization.

To create, edit, or assign roles, your account must have one of the following permissions:

- Global Administrator through Azure Active Directory (Azure AD)
- Managed Service Administrator through the Microsoft Teams Rooms managed service portal

What is a role?

A role defines the set of permissions granted to users assigned to that role. For now, the Microsoft Teams Rooms managed service has three built-in roles: **Managed Service Administrator**, **Site Lead**, and **Site Tech**. They cover some common scenarios for users in your organization that may be involved in managing your rooms.

To see roles, in the left navigation of the Microsoft Teams Rooms managed service portal, go to **Roles**, and then select any of the roles to see the role's properties, permissions, and assignments.

- **Properties**: The name, role type, and description
- **Permissions**: Lists features and level of permissions to which the role has access.
- **Assignments**: A list of role assignments defining which users have the configured permissions over the scope of room resource accounts. A role can have multiple assignments, and a user can be in multiple assignments.

Built-in roles

You can assign built-in roles to groups or users without further configuration. Keep in mind that you can't delete or edit the name, description, type, or permissions of a built-in role.

- **Managed Service Administrator**: Has full access to the Microsoft Teams Room Premium service portal.
- **Site Lead**: Organizes rooms, has access to reports and can manage tickets. Can't reset enrollment key or make changes to the configuration of the service.
- **Site Tech**: Manages tickets for specific rooms. Doesn't have permissions to modify the service or organize rooms in the service.

The following table summarizes what each role can do.

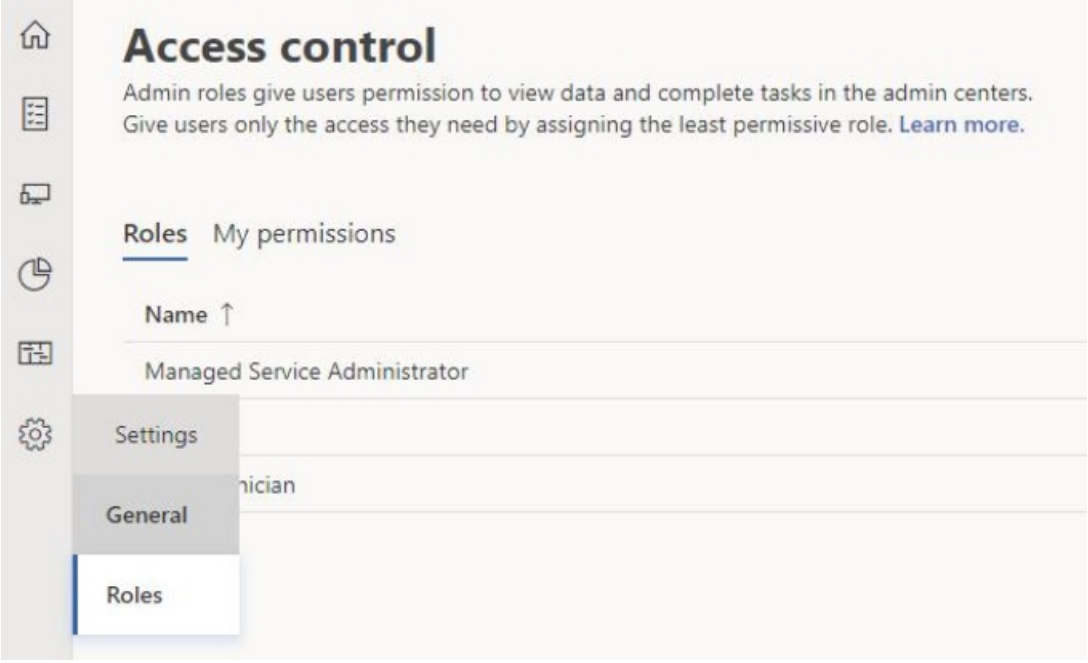
FEATURES	PERMISSION	MANAGED SERVICE ADMINISTRATOR	SITE LEAD	SITE TECH
Rooms	View	✔	✔	✔
	Modify	✔	✔	✔
	Reset key	✔		

FEATURES	PERMISSION	MANAGED SERVICE ADMINISTRATOR	SITE LEAD	SITE TECH
	Download key	✔	✔	✔
	Unenroll	✔	✔	✔
Group management	Create	✔		
	View	✔	✔	
	Modify	✔		
Update ring management	Create	✔		
	View	✔		
	Modify	✔		
Reports	View	✔	✔	
Ticket management	Create customer incident	✔	✔	✔
	View	✔	✔	✔
	Update	✔	✔	✔
Microsoft Teams Rooms managed service settings	View	✔		
	Modify	✔		
Role management	View	✔		
	Modify	✔		

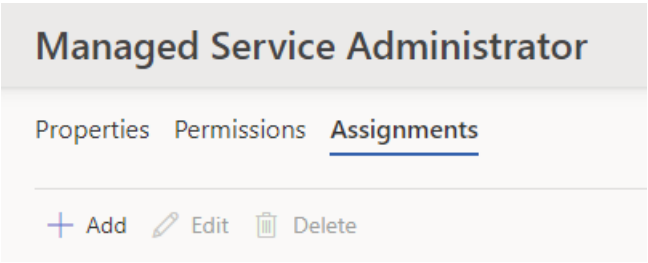
Assign a role

To assign roles, you must be a Global Administrator or Managed Service Administrator.

1. In the left navigation of the Microsoft Teams Rooms managed service portal, go to **Settings** > **Roles**.



2. Select the role you want to assign.
3. In the role pane, select **Assignments** > **Add**.



4. On the **General settings** page, under **Assignment properties**, enter a name for this assignment. The description is optional. Choose **Next.**
5. On the **Members** page, in the **Search for user or security group** box, enter the name of a user or security group in your tenant to which you want to give permissions, and then complete the selection. Choose **Next**.
6. On the **Scope** page, in the **Search for room or room group** box, type the name of either a room or room group that the user will be allowed to manage. Choose **Next**.
7. On the **Finish** page, review the details of the assignment. If you're satisfied with the configuration, choose **Add assignment**. If you want to edit a section, use the **Previous** button or select the step in the left navigation.

Related topics

- Microsoft Teams Rooms managed service

Deployment overview

7/8/2020 • 10 minutes to read • Edit Online

Deployment of Microsoft Teams Rooms essentially breaks down into phases:

- Confirming that your deployment locations (rooms) meet the deployment dependencies
- Creating Microsoft Teams or Skype for Business and Exchange accounts and assigning them to the console devices (see Configure accounts for Microsoft Teams Rooms)
- Reimaging Microsoft Surface tablets to work as Microsoft Teams Rooms consoles (see Configure a Microsoft Teams Rooms console or Deploy Microsoft Teams Rooms mass deployment guide)
- (Optional) Setting up Microsoft Operations Management Suite for your systems (see Deploy Microsoft Teams Rooms management with Azure Monitor
- Setting up consoles in meeting rooms and connecting the peripheral devices you need (see the OEM documentation for your set of devices)

AV techs can be used for the last task, but your organization's IT department will need to do the other parts of the process.

Site readiness

While the ordered devices are being delivered to your organization, work with your networking and facilities and AV teams to make sure that deployment dependencies are met and each site and room is ready in terms of power, networking, and display. In addition, make sure the physical installation requirements are met. For physical installation considerations, please visit the vendor's site and leverage the experience of your AV team when installing and mounting screens and running cabling.

You can find out more about these dependencies in the planning guidance links below:

- Check network availability
- Certificates
- Proxy

Pro Tip - If you intend to use proxy servers to provide access to Teams or Skype for Business Online, first review this article. Note that when it comes to Skype for Business traffic over proxy servers, we recommend bypassing proxy servers altogether. Skype for Business traffic is already encrypted, so proxy servers don't make it more secure. As part of your wider deployment, we recommend that you follow the guidance in Prepare your network for Teams for bandwidth planning and assessing your network's suitability for real-time traffic.

Decision points	• Confirm that your sites meet the key requirements for Microsoft Teams Rooms. • Confirm that you've provided sufficient bandwidth for each site.
Next steps	• Start to plan your device deployment and configuration.

Service readiness

To prepare for your Microsoft Teams Rooms deployment, do the following key, central tasks:

- Define Microsoft Teams Rooms service account features.
- Prepare an organizational unit and Active Directory group to hold your Microsoft Teams Rooms machine and service accounts, and—optionally—prepare Group Policy objects (GPOs) to enable PowerShell remoting.

Define Microsoft Teams Rooms service account features

Depending on the collaboration scenarios that you've decided to enable with your Microsoft Teams Rooms deployment, you'll need to determine the features and capabilities that you assign to each Microsoft Teams Rooms service account that you enable.

SCENARIO	DESCRIPTION	MICROSOFT TEAMS ROOMS SERVICE ACCOUNT FEATURE
Interactive meetings	Using voice, video, and screen sharing; making the Microsoft Teams Rooms a bookable resource	Enabled for Skype for Business, enabled for Exchange (Resource Mailbox)
Dial-in conferencing	Enable meetings started *directly* from the Microsoft Teams Rooms console with dial-in conferencing coordinates	Enabled for Audio Conferencing
Outbound/inbound PSTN Calling	Enable the Microsoft Teams Rooms console to make and receive PSTN calls	Enabled for Phone System

For more information about Microsoft Teams Rooms accounts, see Configure accounts for Microsoft Teams Rooms.

Decision points	• Decide which scenarios you'll support, and identify licensing requirements for your Microsoft Teams Rooms service accounts.
Next steps	• Prepare to host machine and service accounts.

Sample Microsoft Teams Rooms service account planning table

SITE	ROOM NAME	ROOM TYPE	FUTURE ROOM CAPABILITIES	MICROSOFT TEAMS ROOMS ACCOUNT FEATURES
London HQ	Curie	Medium	1 screen, audio and video plus presentation Dial-in conferencing access PSTN access	Enabled for Skype for Business, enabled for Exchange (Resource Mailbox) Enabled for Audio Conferencing Enabled for Phone System

SITE	ROOM NAME	ROOM TYPE	FUTURE ROOM CAPABILITIES	MICROSOFT TEAMS ROOMS ACCOUNT FEATURES
Sydney HQ	Hill	Large	2 Screens, audio and video plus presentation Dial-in conferencing access PSTN access	Enabled for Skype for Business, enabled for Exchange (Resource Mailbox) Enabled for Audio Conferencing Enabled for Phone System

Prepare to host Microsoft Teams Rooms machine and service accounts (optional)

To enable you to manage and report on your Microsoft Teams Rooms machine and service accounts, prepare your on-premises Active Directory or Azure Active Directory (Azure AD).

Define an on-premises Active Directory or Azure AD group to add all Microsoft Teams Rooms service (user) accounts to, and then create usage reports by using the Get-CSUserSession PowerShell cmdlet across your Microsoft Teams Rooms deployment. For example, create a group named SkypeRoomSystemsv2-Service-Accounts.

Define one organizational unit in your on-premises Active Directory or Azure AD hierarchy to hold all Microsoft Teams Rooms machine accounts (if they're joined to the domain) and one organizational unit to hold all the Microsoft Teams Rooms user accounts. If you do create an organizational unit for the Microsoft Teams Rooms machine accounts, consider disabling inheritance to ensure that you apply only the policies you intended to apply to the domain-joined Microsoft Teams Rooms.

Create a Group Policy object assigned to the organization unit that contains your Microsoft Teams Rooms computer accounts. Use this to:

- Set power and local account settings.
- Enable Windows Update.
- Enable PowerShell remoting. You can configure a start-up script to run a simple script: Enable-PSRemoting -Force

You can use PowerShell to perform a number of remote management activities, including getting and setting configuration information. PowerShell remoting must be enabled *before* any PowerShell remote management can take place and should be considered as part of your deployment processes or configured via Group Policy. For more information about these capabilities and enabling them, see Maintenance and operations.

Configuration and deployment

Planning for configuration and deployment covers the following key areas:

- Account provisioning
- Device software installation
- Device deployment
- Microsoft Teams Rooms application and peripheral device configuration
- Testing
- Asset management

Account provisioning

Each Microsoft Teams Rooms device requires a dedicated and unique resource account that must be enabled for both Microsoft Teams or Skype for Business and Exchange. This account must have a room mailbox hosted on Exchange and be enabled as a meeting room in the Teams or Skype for Business deployment. On the Exchange

side, calendar processing must be configured so that the device can automatically accept incoming meeting requests. For more information about creating these accounts, see Configure accounts for Microsoft Teams Rooms.

Pro Tip – Make the display names for these accounts descriptive and easy to understand. These are the names that users will see when searching for and adding Microsoft Teams Rooms systems to meetings. Some organizations use the convention *Site-Room Name*(*Max Room Capacity*)-RS, so for example Curie—a 12-person conference room in London—might have the display name LON-CURIE(12)-RS.

 Decision points	• Decide the naming convention for your Microsoft Teams Rooms accounts. • Decide whether you'll create individual accounts or use bulk-provisioning scripts.
 Next steps	• Start to plan your device deployment.

Device software installation

When planning to deploy Microsoft Teams Rooms, you have a number of options to consider to install the required software. Common scenarios and approaches are described in the following table.

SCENARIO	APPROACH
Deploying a small number of Microsoft Teams Rooms devices (<10).	If using Surface Pro–based Microsoft Teams Rooms, follow the installation instructions for a per-device install. This handy video walks you through the process. If using an integrated solution, deploy by using the vendor image and configure settings as required.
Deploying between 10 and 50 devices from a single vendor.	Create a WIM-based image, pause after step 6 in the guidance, and capture a distribution image to be used with your cloning distribution technology.
Deploying more than 50 Microsoft Teams Rooms devices, deploying devices from more than one vendor, or requiring organization-specific agents as part of the deployment.	Use a task sequencer–based software build and distribution platform, such as Microsoft Endpoint Configuration Manager.

Pro Tip - Each Microsoft Teams Rooms must have a valid and unique machine name on your network. Many monitoring and alerting systems display the machine name as a key identifier, so it's important to develop a naming convention for Microsoft Teams Rooms deployments that allows support personnel to easily locate the Microsoft Teams Rooms that has been flagged as requiring an action. An example might be using a pattern of MTR-*Site-Room Name* (MTR-LON-CURIE).

As part of the deployment, you'll also need to consider your strategy for managing and configuring the local accounts that are created by the Microsoft Teams Rooms application installer.

We provide guidance on how to use the Microsoft Azure Monitor to monitor the Microsoft Teams Rooms deployment and report on availability, hardware/software errors, and Microsoft Teams Rooms application version. If you decide to use Microsoft Operations Management Suite, you should install the Operations Management Suite agent as part of the software installation process and configure the workspace connection information for your workspace.

An additional consideration is whether the Microsoft Teams Rooms will be domain-joined. Information about the benefits of domain joining can be found in Skype Room System domain joining considerations.

Decision points	• Decide the Microsoft Teams Rooms device-naming convention to be used during your deployment. • Decide whether you'll join Microsoft Teams Rooms devices to your domain, and how to manage and configure local accounts. • Decide whether you'll use Operations Management Suite to monitor the Microsoft Teams Rooms deployment. • Decide which method you'll use to deploy the software and agents to the Microsoft Teams Rooms system in preparation for the device deployment.
Next steps	• Start to plan your device deployment approach.

Device deployment

After you've deployed your software to the Microsoft Teams Rooms units, create your plan to ship the devices and their assigned peripheral devices to your rooms, and then proceed to installation and configuration.

Decision points	• Decide who will manage the site-by-site deployment. • Identify the resources who will install the Microsoft Teams Rooms devices on site and undertake the configuration and testing.
Next steps	• Start device testing.

Sample deployment table

SITE	ROOM NAME	ROOM TYPE	MICROSOFT TEAMS ROOMS SYSTEM	PERIPHERAL DEVICES	MICROSOFT TEAMS ROOMS COMPUTER NAME	MICROSOFT TEAMS ROOMS RESOURCE ACCOUNT
London HQ	Curie	Medium				
Sydney HQ	Hill	Large				

Microsoft Teams Rooms application and peripheral device configuration

After each Microsoft Teams Rooms system has been physically deployed and the supported peripheral devices connected, you'll need to configure the Microsoft Teams Rooms application to assign the Microsoft Teams Rooms resource account and password created earlier, to enable the Microsoft Teams Rooms system to sign in to Microsoft Teams or Skype for Business and Exchange. It's key to leverage certified USB audio and video peripherals linked elsewhere in the document. Not doing so can result in unpredictable behavior.

You can manually configure each Microsoft Teams Rooms system. Alternatively, you can use a centrally stored, per–Microsoft Teams Rooms XML configuration file to manage the application settings and leverage a start-up GPO script to reapply the configuration you want, each time the Microsoft Teams Rooms system boots.

For more information about how to use the XML configuration file, see Manage a Microsoft Teams Rooms console settings remotely with an XML configuration file.

You can use remote PowerShell to pull the Microsoft Teams Rooms configuration for reporting needs.

 Decision points	• Decide whether you'll manually configure each Microsoft Teams Rooms system or use a central XML file (one per Microsoft Teams Rooms device).
 Next steps	• Define your remote management approach.

Testing

After the Microsoft Teams Rooms system has been deployed, you should test it. Check that the capabilities listed in Microsoft Teams Rooms help are working on the deployed device. We highly recommend that the deployment team verify that the Microsoft Teams Rooms is logging to Microsoft Operations Management Suite (if used). It's also important that you make a number of test calls and meetings to check quality. For more information, see this useful deployment checklist.

We recommend that as part of the general Teams or Skype for Business rollout, you configure building files for Call Quality Dashboard (CQD), monitor quality trends, and engage in the Quality of Experience Review process. For more information, see Improve and monitor call quality for Teams.

Asset management

As part of the deployment, you'll want to update your asset register with the room name, Microsoft Teams Rooms device name, signed-in Microsoft Teams Rooms resource account, and assigned peripheral devices (and which USB ports they use).

Sample asset table

SITE	ROOM NAME	ROOM TYPE	MICROSOFT TEAMS ROOMS SERIAL NO.	PERIPHERAL DEVICES/ SERIAL NOS./ PORTS	MICROSOFT TEAMS ROOMS COMPUTER NAME	MICROSOFT TEAMS ROOMS SERVICE ACCOUNT	DATE DEPLOYED
London HQ	Curie	Medium					
Sydney HQ	Hill	Large					

Configure accounts for Microsoft Teams Rooms

9/24/2020 • 4 minutes to read • Edit Online

Read this topic to learn about Microsoft Teams Rooms and how it integrates with Exchange and Skype for Business.

This topic introduces how to create accounts used by Microsoft Teams Rooms in Microsoft Exchange and Skype for Business. Deployment instructions for Microsoft Teams Rooms devices is covered in Configure a Microsoft Teams Rooms console. Your infrastructure will likely fall into one of the following configurations:

- Online deployment: Your organization's environment is deployed entirely on Microsoft 365 or Office 365. For more information, see Deploy Microsoft Teams Rooms with Microsoft 365 or Office 365.
- On-premises deployment: Your organization has servers that it controls, where Active Directory, Exchange, and Skype for Business Server are hosted. For more information, see Deploy Microsoft Teams Rooms with Skype for Business Server
- Hybrid deployments: Your organization has a mix of services, with some hosted on premises and some hosted online through Microsoft 365 or Office 365. With Microsoft Teams Rooms, the following hybrid scenarios are supported:
  - Exchange Online with Skype for Business Server on premises. For more information, see Deploy Microsoft Teams Rooms with Exchange Online (Hybrid).
  - Exchange on premises with Microsoft Teams or Skype for Business Online. For more information, see Deploy Microsoft Teams Rooms with Exchange on premises (Hybrid).

Which configuration you have will affect how you prepare for device setup.

Microsoft Teams Rooms needs to be assigned a "device account" in Active Directory, Exchange, and Skype for Business. The account is used to access its meeting calendar and establish Microsoft Teams or Skype for Business connectivity. People can book this account by scheduling a meeting with it. Microsoft Teams Rooms will be able to join that meeting and provide various features to the meeting attendees.

> **IMPORTANT**
> Without a device account, none of these features will work.

Every device account is unique to a single Microsoft Teams Rooms device, and requires some setup:

- The device account must be configured correctly.
- Your infrastructure must be configured to allow Microsoft Teams Rooms to validate the device account, and to reach the appropriate Microsoft services.

> **IMPORTANT**
> It is highly recommended that account creation be done well in advance of actual hardware installation. Ideally, account preparation is started two to three weeks before installation.

In hybrid environments the account used for Microsoft Teams Rooms must have password sync enabled in Azure Active Directory (AAD) Sync because Microsoft Teams Rooms authentication requires Microsoft 365 or Office 365

authentication. When setting up the account, make sure that the account's SIP address matches its User Principal Name (UPN) in AAD.

You can think of a device account as the resource account that people recognize as a conference room's or meeting space's account. When you want to schedule a meeting using that conference room, you invite the account to that meeting. In order to use Microsoft Teams Rooms most effectively, you do the same with the device account that's assigned to each one.

If you already have a resource mailbox account set up for the meeting space where you're installing Microsoft Teams Rooms, you can change that resource account into a device account. Once that's done, all you need to do is add the device account to a Microsoft Teams Rooms device. See device account setup examples provided below.

With additional configuration, remote management is possible using Microsoft Azure Monitor as described in Plan Microsoft Teams Rooms management with Azure Monitor, Deploy Microsoft Teams Rooms management with Azure Monitor, and Manage Microsoft Teams Rooms devices with Azure Monitor.

Basic configuration

These properties represent the minimum configuration for a device account to work with Microsoft Teams Rooms. Your device account may require further setup.

PROPERTY	PURPOSE
Exchange mailbox (Exchange 2013 SP1 or later, or Exchange Online)	Enabling the account with an Exchange mailbox gives the device account the capability to receive and send both mail and meeting requests, and to display a meetings calendar on the Microsoft Teams Rooms device. The Microsoft Teams Rooms mailbox must be a room mailbox.
Skype for Business is enabled	Skype for Business must be enabled in order to use various conferencing features, like video calls, IM, and screen-sharing. Both Skype for Business Online and Skype for Business Server are supported.
Password-enabled	The device account must be enabled with a password, or it cannot authenticate with either Exchange or Skype for Business Server.

Advanced configuration

While the properties for the basic configuration will allow the device account to be set up in a simple environment, it is possible your environment has other restrictions on directory accounts that must be met in order for Microsoft Teams Rooms to successfully use the device account.

PROPERTY	PURPOSE
Certificate-based authentication	Certificates may be required for both Exchange and Skype for Business Server. To deploy certificates, you can load them when logged in as Admin.

The easiest way to set up device accounts is to configure them using remote Windows PowerShell. Microsoft provides SkypeRoomProvisioningScript.ps1, a script that will help create new device accounts, or validate existing resource accounts you have in order to help you turn them into compatible Microsoft Teams Rooms device accounts.

If you prefer to use the Microsoft 365 or Office 365 UI over Windows PowerShell cmdlets, some steps can be

performed manually. See Creating a device account using Microsoft 365 or Office 365.

See also

Plan for Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Set up Coordinated Meetings with Microsoft Teams Rooms and Surface Hub

8/18/2020 • 10 minutes to read • Edit Online

If you have one or more Microsoft Teams Rooms devices or Surface Hubs in a meeting room, you can set up Coordinated Meetings. Coordinated Meetings lets you set up your Teams Rooms devices and Surface Hubs so that when you join a meeting on one device, the other devices in the room are also joined to the same meeting. You can configure your cameras, speakers, and microphones so that the ones that give participants the best experience are enabled while others are disabled. This avoids the dreaded echo and feedback noise participants can experience when adding multiple devices to a meeting.

To set up Coordinated Meetings, you need to make sure your Teams Rooms devices and Surface Hubs are already correctly configured to participate in meetings. Most importantly, each device needs to have its own Exchange room mailbox. For information on how to set them up, see the following articles:

- Deploy Microsoft Teams Rooms
- Create Surface Hub 2S device account

After you've confirmed that your Teams Rooms devices and Surface Hubs can automatically accept meetings and join them successfully, you can set up Coordinated Meetings.

The following steps should be completed for each meeting room separately. Devices in one meeting room shouldn't be set up for Coordinated Meetings with devices in other meeting rooms.

Step 1: Plan your Coordinated Meeting experience

Before you make any configuration changes, you need to decide which devices will do what in each meeting room. That is, for a given meeting room, you need to decide which device will have the active microphone, camera, and whiteboard. How you configure your devices depends on your specific environment, but here are some general recommendations to start with:

- **Microphone** Teams Rooms device
- **Camera** Teams Rooms device (on by default) and Surface Hub (off by default, but allowed to be turned on by participants)
- **Whiteboard** Surface Hub

> **IMPORTANT**
> Make sure you enable the microphone only on one device. If you enable it on more than one device, you'll experience audio echo and feedback.

Step 2: Get your devices' UPNs

When you set up a Coordinated Meeting experience in a meeting room, you need to tell the Teams Rooms devices and Surface Hubs in that room which devices to coordinate with. This is done by adding the user principal name (UPN) of the devices it should coordinate with to its configuration. If you don't know the UPNs for each of the devices you want to set up for Coordinated Meetings, you can find them using the Microsoft 365 admin center.

You need to be assigned an admin role to access the Microsoft 365 admin center. For more information, see About admin roles.

To get the UPNs of your Teams Rooms devices and Surface Hubs, do the following:

1. Sign in to the Microsoft 365 admin center by visiting https://admin.microsoft.com.
2. Go to **Users** > **Active users**.
3. Find the name of your Teams Rooms device or Surface Hub in the **Display name** column (you can use the **Search** box if you have many users).
4. Find the UPN in the **Username** column (it'll look something like alias@contoso.com or alias@contoso.onmicrosoft.com).
5. Repeat this for each device that will participate in Coordinated Meetings.

Step 3: Create a deployment worksheet

After you've planned your Coordinated Meeting experience and gathered a list of your devices' UPNs, it's a good idea to create a deployment worksheet. A deployment worksheet will help you visualize the configuration you want to set across all of your devices, allowing you to validate your choices and check for errors.

In a spreadsheet app, add rows for the following in the first column:

SETTING	DESCRIPTION
Audio default	Determines on which device the microphone will be active when a meeting starts. Only one device (typically a Teams Rooms device) can have this field set to `true` while the rest of the devices must have this field set to `false` to avoid audio echo and feedback.
Audio enabled	Determines whether participants in a meeting can toggle the microphone on or off. Devices on which **Audio default** is set to `false` should have this setting set to `false` so that participants can't accidentally turn on a microphone and cause audio echo or feedback. If **Audio default** is set to `true`, this setting is ignored and participants can mute or unmute the microphone.
Video default	Determines on which device the camera will be active when a meeting starts. For the best experience, we recommend that only the Teams Rooms device be set to `true` while all other devices are set to `false`.
Video enabled	Determines whether participants in a meeting can toggle the camera on or off. You can set this to `true` on any other devices in the event participants want to share different video perspectives (such as if a participant is using the Surface Hub whiteboard). If you don't want participants to turn a camera on or off on a device, set this to `false`. If **Video default** is set to `true`, this setting is ignored and participants can turn the camera on or off.
Whiteboard default	Determines whether the Teams Rooms device will display a whiteboard shared by one of the meeting participants. We recommend that you set this to `false` if you have a Surface Hub and `true` if you don't have one. This setting has no effect on Surface Hubs. Surface Hubs will always display a whiteboard shared by meeting participants.

SETTING	DESCRIPTION
Whiteboard enabled	Determines whether participants in a meeting can toggle the whiteboard on or off. If you don't want participants to turn the whiteboard on or off on a device, set this to `false`. If **Whiteboard default** is set to `true`, this setting is ignored and participants can turn the whiteboard on or off.
Trusted accounts	This is a comma-separated list of UPNs for each Teams Room device or Surface Hub that the device should accept meeting join requests from, or to which meeting join requests should be sent.

In subsequent columns, add each of your Teams Rooms devices and Surface Hubs. In each column, fill out the values that correspond to the experience you want for the meeting room. Here's an example with one Teams Rooms device and one Surface Hub:

- Teams device
  - Audio and video are turned **on** when a meeting starts. Participants **can** toggle audio and video on or off.
  - Displaying a shared whiteboard is turned off.
- Surface Hub
  - Audio is turned **off** when a meeting starts. Participants **can't** toggle audio on or off.
  - Video is turned **off** when a meeting starts. Participants **can** toggle video on or off.

SETTING	TEAMS ROOM	SURFACE HUB
Audio default	`true`	`false`
Audio enabled	`true`	`false`
Video default	`true`	`false`
Video enabled	`true`	`true`
Whiteboard default	`false`	`false`
Trusted accounts	hub@contoso.com	room@contoso.com

Step 4: Configure Teams Rooms device

You can either set up Coordinated Meetings on a Teams Rooms device using the device's touch screen or, if you need to set up many devices and want to do so from a central location, you can use an XML configuration file.

Use the worksheet you created in the previous step to help you set up your devices.

Use the Teams Rooms device's touch screen

To set up Coordinated Meetings on a device, do the following:

1. Select **... More** > **Settings**.
2. Enter the Administrator password and select **Yes**.
3. Select **Coordinated Meetings**.
4. Under **Options**, set **Coordinated Meeting** to *on*.

5. If **Audio default** in your worksheet is `true`, set **Turn on this device's microphone** to on, otherwise leave it *off*.
6. If **Audio enabled** in your worksheet is `true`, select **Let people enable when joining a meeting** under **Turn on this device's microphone**. This option can't be turned off if **Turn on this device's microphone** is set to on.
7. If **Video default** in your worksheet is `true`, set **Turn on this device's camera** to on, otherwise leave it *off*.
8. If **Video enabled** in your worksheet is `true`, select **Let people enable when joining a meeting** under **Turn on this device's camera**. This option can't be turned off if **Turn on this device's camera** is set to *on*.
9. If **Whiteboard default** in your worksheet is `true`, set **Turn on whiteboarding on this device** to *on*, otherwise leave it *off*.
10. Under **Trusted device accounts**, type each UPN listed in **Trusted accounts** in your worksheet. Separate multiple UPNs with commas.
11. Select **Save and exit**.

After you select **Save and exit**, the device will restart and it'll be ready to participate in Coordinated Meetings.

Use the Teams Rooms XML configuration file

Coordinated Meetings can be set up using the Teams Rooms device's `SkypeSettings.xml` XML configuration file. The `SkypeSettings.xml` file isn't a static file. When the Teams Rooms device start, it checks in `C:\Users\Skype\AppData\Local\Packages\Microsoft.SkypeRoomSystem_8wekyb3d8bbwe\LocalState` for a file named `SkypeSettings.xml`. If the file exists, the device reads and applies the configuration specified in the file. After it's done applying the configuration, the file is deleted. For more information about the `SkypeSettings.xml` file, see Manage console settings with an XML configuration file.

The following is the syntax of the Coordinated Meetings settings in the configuration file:

```
<CoordinatedMeetings enabled="true">
    <Settings>
        <Audio default="true" enabled="true"/>
        <Video default="true" enabled="true"/>
        <Whiteboard default="false" enabled="false"/>
    </Settings>
    <TrustedAccounts>hub@contoso.com</TrustedAccounts>
</CoordinatedMeetings>
```

To set up Coordinated Meetings on a device, do the following:

1. In a text file editor, such as Visual Studio Code or Notepad, paste the above XML into a new file.
2. Set each of the XML elements to the corresponding `true` or `false` value in your spreadsheet. For example, if **Audio default** is `true`, set `<Audio default="true">`.
3. Be sure to change `TrustedAccounts` to your list of UPNs.
4. Save the file with the name `SkypeSettings.xml`.
5. Place the file in the Teams Rooms device's `C:\Users\Skype\AppData\Local\Packages\Microsoft.SkypeRoomSystem_8wekyb3d8bbwe\LocalState` folder. You can do this a few ways:

   - **Copy the file to your Teams Rooms device** You'll need to enable file sharing and create a network share before you can copy files to your device. After you do that, you can connect to network share and copy the file to the device. For more information, see Microsoft Teams Rooms maintenance and operations.
   - **Use a Group Policy** Create a group policy to copy the file to device. For more information, see Group

Policy Overview.

- **Download the file on the Teams Rooms device** You can log into the device using Admin mode and then copy the file to the device from a network share or USB drive. For more information, see Switching to Admin mode.

6. Restart the device. You can do this a couple ways:

   - **Remote PowerShell** You can run the Shutdown command on the device using Remote PowerShell. For more information, see Remote Management using PowerShell.
   - **Run Restart-Computer** You can run the `Restart-Computer` cmdlet on your local computer and specify the computer name of the device you want to restart. For more information, see Restart-Computer.

Step 5: Configure Surface Hub

You can use Windows Configuration Designer to create a provisioning package that you can use to apply Coordinating Meetings settings to your Surface Hubs. You'll paste the XML file you created above into Windows Configuration Designer to create the provisioning package.

Create Coordinated Meetings XML configuration file for Surface Hub

Both Windows Configuration Designer and Microsoft Intune are used to apply the Coordinated Meetings configuration to your Surface Hubs. The configuration is defined using XML. Before you go further, you need to create the XML that will be applied.

The following is the syntax of the Coordinated Meetings XML configuration file.

```
<SurfaceHubSettings>
    <BluetoothAdvertisementEnabled>true</BluetoothAdvertisementEnabled>
    <AutoAcceptProximateMeetingInvitations>true</AutoAcceptProximateMeetingInvitations>
    <CoordinatedMeetings enabled="true">
        <TrustedAccounts>room@contoso.com</TrustedAccounts>
        <Settings>
            <Audio default="false" enabled="false" />
            <Video default="false" enabled="true" />
        </Settings>
    </CoordinatedMeetings>
</SurfaceHubSettings>
```

Do the following to prepare the XML for Windows Configuration Designer or Microsoft Intune:

1. In a text file editor, such as Visual Studio Code or Notepad, paste the above XML into a new file.
2. Set each of the XML elements to the corresponding `true` or `false` value in your spreadsheet. For example, if **Audio default** is `true`, set `<Audio default="true">`.
3. Be sure to change `TrustedAccounts` to your list of UPNs.
4. Windows Configuration Designer requires that the XML be on a single line. Remove all the line breaks between each line so that the XML looks like the following:

   ```
   <SurfaceHubSettings><BluetoothAdvertisementEnabled>true</BluetoothAdvertisementEnabled>...
   ```

5. Save the file on your computer.

After you've created your XML configuration file, use the steps in Manage Microsoft Teams settings on Surface Hub to apply it to your Surface Hubs.

Manage Microsoft Teams settings on Surface Hub

8/15/2020 • 7 minutes to read • Edit Online

You can manage Microsoft Teams settings on a Surface Hub using Windows Configuration Designer or Microsoft Intune in Microsoft Endpoint Manager. Knowledge of Windows Configuration Designer or Microsoft Intune is required to make changes to Teams settings. For more information about these options, see the following articles:

- Create a provisioning package for Windows 10
- What is Microsoft Intune device management?

Windows Configuration Designer is a good option if you only have a few Surface Hub devices and you can access them easily. If you have many Surface Hubs, or if they're in remote locations, use Microsoft Intune in Microsoft Endpoint Manager if its deployed in your organization. Regardless of the method you choose, you need to create an XML configuration file for make changes to Teams settings on Surface Hub.

Teams configuration file syntax

Teams configuration on a Surface Hub is defined using an XML file. The XML file contains all the settings that can be used to control how Teams works. Both Windows Configuration Designer and Microsoft Intune use the same XML syntax. Here's an example of the Teams configuration XML file:

```
<SurfaceHubSettings>
    <BluetoothAdvertisementEnabled>true</BluetoothAdvertisementEnabled>
    <AutoAcceptProximateMeetingInvitations>true</AutoAcceptProximateMeetingInvitations>
    <CoordinatedMeetings enabled="true">
        <TrustedAccounts>room@contoso.com</TrustedAccounts>
        <Settings>
            <Audio default="false" enabled="false" />
            <Video default="false" enabled="true" />
        </Settings>
    </CoordinatedMeetings>
</SurfaceHubSettings>
```

The following table describes all the configuration settings available in the configuration file:

PARENT	ELEMENT	ATTRIBUTE	DESCRIPTION
None	`<SurfaceHubSettings>`		Contains all configuration elements for Teams configuration on a Surface Hub.
`<SurfaceHubSettings>`	`<BluetoothAdvertisementEnabled>`		Determines whether Surface Hub advertises that it's available for Bluetooth connections. Accepted values: `true`, `false`

PARENT	ELEMENT	ATTRIBUTE	DESCRIPTION
`<SurfaceHubSettings>`	`<AutoAcceptProximateMeetingInvitations>`		Determines whether Teams will automatically accept proximity-based meetings. Accepted values: `true`, `false`
`<SurfaceHubSettings>`	`<CoordinatedMeetings>`		Contains all configuration elements for Coordinated Meetings.
		`enabled`	Determines whether Teams is configured to participate in Coordinated Meetings with other devices. Accepted values: `true`, `false`
`<CoordinatedMeetings>`	`<TrustedAccounts>`		This is a comma-separated list of UPNs for each Teams Room device or Surface Hub that the device should accept meeting join requests from, or to which meeting join requests should be sent. Accepted values: string
`<CoordinatedMeetings>`	`<Settings>`		Contains configuration audio and video configuration elements for Coordinated Meetings
`<Settings>`	`<Audio>`		Controls audio configuration for Teams on a Surface Hub.
		`default`	Determines on which device the microphone will be active when a meeting starts. Only one device (typically a Teams Rooms device) can have this field set to `true` while the rest of the devices must have this field set to `false` to avoid audio echo and feedback. Accepted values: `true`, `false`

PARENT	ELEMENT	ATTRIBUTE	DESCRIPTION
		`enabled`	Determines whether participants in a meeting can toggle the microphone on or off. Devices on which **Audio default** is set to `false` should have this setting set to `false` so that participants can't accidentally turn on a microphone and cause audio echo or feedback. If **Audio default** is set to `true`, this setting is ignored and participants can mute or unmute the microphone. Accepted values: `true`, `false`
`<Settings>`	`<Video>`		Controls video configuration for Teams on a Surface Hub.
		`default`	Determines on which device the camera will be active when a meeting starts. For the best experience, we recommend that only the Teams Rooms device be set to `true` while all other devices are set to `false`. Accepted values: `true`, `false`
		`enabled`	Determines whether participants in a meeting can toggle the camera on or off. You can set this to `true` on any other devices in the event participants want to share different video perspectives (such as if a participant is using the Surface Hub whiteboard). If you don't want participants to turn a camera on or off on a device, set this to `false`. If **Video default** is set to `true`, this setting is ignored and participants can turn the camera on or off. Accepted values: `true`, `false`

Apply Teams settings to Surface Hub

Apply or update Teams configuration settings on Surface Hub using either Windows Configuration Designer or Microsoft Intune in Microsoft Endpoint Manager.

Use Windows Configuration Designer

You can use Windows Configuration Designer to create a provisioning package that you can use to apply Teams settings to your Surface Hubs. You'll paste the XML file you created above into Windows Configuration Designer to create the provisioning package.

> **IMPORTANT**
> If you've already applied Teams configuration to your Surface Hub using a provisioning package and want to change it, you need to remove the existing provisioning package first. For more information, see Remove a provisioning package created by Windows Configuration Designer.

Do the following to create the provisioning package in Windows Configuration Designer:

1. Install Windows Configuration Designer from the Windows Store on your local computer and open it
2. Select **Provision Surface Hub devices** and then **Switch to advanced editor**
3. On the next screen, expand **WindowsTeamSettings** > **Teams** and select **Configurations**
4. In the field next to **Configurations** in the middle pane, paste the single line of XML you created above
5. Select **Export** > **Provisioning package**
6. Provide a name for the provisioning package in **Name** and select **Next** > **Next**
7. Specify a location to save the provisioning package and select **Next**
8. Select **Build** to create the provisioning package and then **Finish**

Finally, after you've created the provisioning package, do the following to apply the provisioning package to your Surface Hub:

1. Save the provisioning package you created above to a USB drive
2. Insert the USB drive into your Surface Hub
3. On your Surface Hub, open the Start menu, select **All apps**, and then select **Settings**
4. Provide your admin username and password and then select **Yes**
5. Go to **Surface Hub**, **Device management**, **Add or remove a provisioning package**, and then **Add a package**
6. Under **Select a package**, select **Add** next to your provisioning package, and then restart your Surface Hub

Use Microsoft Intune

If your Surface Hubs are managed using Microsoft Intune in Microsoft Endpoint Management, you can use it to apply Teams settings to your Surface Hubs. You'll create a new configuration profile and then paste the XML file you created above into it.

> **IMPORTANT**
> Your Surface Hubs need to be in a device group so that the Microsoft Intune can identify which devices to apply the configuration profile to. For information about how to create a device group, see Add groups to organize users and devices.

Do the following to create a configuration profile to apply Teams settings to your Surface Hubs:

1. Sign in to Microsoft Endpoint Manager by visiting https://endpoint.microsoft.com/
2. Navigate to **Devices** > **Configuration profiles** and select **Create profile**
3. Under **Platform**, select **Windows 10 and later**
4. Under **Profile**, select **Custom**, and then click **Create**

5. On the **Basics** tab, in **Name**, provide a descriptive name for your configuration profile and select **Next**
6. On the **Configuration settings** tab, select **Add**
7. In the **Add row** pane, do the following:
   a. Provide a descriptive name and, optionally, a description of the Teams setting you're adding
   b. In **OMA-URI**, enter `./Vendor/MSFT/SurfaceHub/InBoxApps/Teams/Configurations`
   c. In **Data type**, select **String (XML file)**
   d. Open the file browser, select the XML file you created above, and **Open**
8. Select **Add** and then **Next**
9. On the **Assignments** tab, make sure **Assign to** is set to **Selected groups**
10. Under **Selected groups**, select **Select groups to include** and choose the group that contains your Surface Hubs, and then select **Select**
11. Select **Next**, **Next**
12. On the **Review + create**, select **Create**

Remove Teams settings from a Surface Hub

Remove Teams configuration settings on Surface Hub using either Windows Configuration Designer or Microsoft Intune in Microsoft Endpoint Manager.

Remove a provisioning package created by Windows Configuration Designer

If you applied Teams settings to a Surface Hub using a provisioning package created by Windows Configuration Designer, use the following steps to remove the package and its settings:

1. On your Surface Hub, open the Start menu, select **All apps**, and then select **Settings**
2. Provide your admin username and password and then select **Yes**
3. Go to **Surface Hub**, **Device management** and then **Add or remove a provisioning package**
4. Next to the provisioning package you want to remove, select **Remove**
5. Go to **Surface Hub** and then **Apps & features**
6. Find **Microsoft Teams for Surface Hub** and then select **Advanced Options**
7. Select **Reset**, and then **Reset** again
8. Restart your Surface Hub

Remove settings applied by Microsoft Intune

If you applied Teams settings to a Surface Hub using Microsoft Intune in Microsoft Endpoint Management, use the following steps to remove the configuration profile and its settings:

1. Sign in to Microsoft Endpoint Manager by visiting https://endpoint.microsoft.com/
2. Navigate to **Devices** > **Configuration profiles**
3. Select the configuration profile that contains the Coordinated Meeting settings you want to remove
4. On the configuration profile details page, select **Delete** and then **OK**

After you've removed configuration profile that contained the Coordinated Meeting settings for your Surface Hub, use the following steps to reset the Teams app on the Surface Hub:

1. On your Surface Hub, open the Start menu, select **All apps**, and then select **Settings**
2. Provide your admin username and password and then select **Yes**
3. Go to **Surface Hub** and then **Apps & features**
4. Find **Microsoft Teams for Surface Hub** and then select **Advanced Options**
5. Select **Reset**, and then **Reset** again
6. Restart your Surface Hub

Deploy Microsoft Teams Rooms with Microsoft 365 or Office 365

9/15/2020 • 6 minutes to read • Edit Online

Read this topic for information on how to deploy Microsoft Teams Rooms with Microsoft 365 or Office 365, where Microsoft Teams or Skype for Business and Exchange are both online.

The easiest way to set up user accounts is to configure them using remote Windows PowerShell. Microsoft provides SkypeRoomProvisioningScript.ps1, a script that will help create new user accounts, or validate existing resource accounts you have in order to help you turn them into compatible Microsoft Teams Rooms user accounts. If you prefer, you can follow the steps below to configure accounts your Microsoft Teams Rooms device will use.

Requirements

Before you deploy Microsoft Teams Rooms with Microsoft 365 or Office 365, be sure you have met the requirements. For more information, see Microsoft Teams Rooms requirements.

To enable Skype for Business, you must have the following:

- Skype for Business Online (Plan 2, or an Enterprise-based plan) or higher in your Microsoft 365 or Office 365 plan. The plan needs to allow dial-in conferencing capabilities.
- If you need dial-in capabilities from a meeting, you will need an Audio Conferencing and Phone System license. If you need dial-out capabilities from a meeting, you will need an Audio Conferencing license.
- Your tenant users must have Exchange mailboxes.
- Your Microsoft Teams Rooms account does require at a minimum a Skype for Business Online (Plan 2) license, but it does not require an Exchange Online license. See Microsoft Teams Rooms licenses for details.

For details on Skype for Business Online Plans, see the Skype for Business Online Service Description.

Add a device account

1. Connect to Exchange Online PowerShell. For instructions, see Connect to Exchange Online PowerShell.
2. In Exchange Online PowerShell, create a new room mailbox or modify an existing room mailbox. By default, room mailboxes don't have associated accounts, so you'll need to add an account when you create or modify a room mailbox that allows it to authenticate with Skype Room Systems v2.
   - To create a new room mailbox, use the following syntax:

     ```
     New-Mailbox -Name "<Unique Name>" -Alias <Alias> -Room -EnableRoomMailboxAccount $true -
     MicrosoftOnlineServicesID <Account> -RoomMailboxPassword (ConvertTo-SecureString -String
     '<Password>' -AsPlainText -Force)
     ```

     This example creates a new room mailbox with the following settings:

     - Name: Rigel-01
     - Alias: Rigel1
     - Account: Rigel1@contoso.onmicrosoft.com
     - Account password: P@$$W0rd5959

```
New-Mailbox -Name "Rigel-01" -Alias Rigel1 -Room -EnableRoomMailboxAccount $true -
MicrosoftOnlineServicesID Rigel1@contoso.onmicrosoft.com -RoomMailboxPassword (ConvertTo-
SecureString -String 'P@$$W0rd5959' -AsPlainText -Force)
```

- To modify an existing room mailbox, use the following syntax:

```
Set-Mailbox -Identity <RoomMailboxIdentity> -EnableRoomMailboxAccount $true -RoomMailboxPassword
(ConvertTo-SecureString -String '<Password>' -AsPlainText -Force)
```

This example enables the account for the existing room mailbox that has the alias value Rigel2, and sets the password to 9898P@$$W0rd. Note that the account will be Rigel2@contoso.onmicrosoft.com because of the existing alias value.

```
Set-Mailbox -Identity Rigel2 -EnableRoomMailboxAccount $true -RoomMailboxPassword (ConvertTo-
SecureString -String '9898P@$$W0rd' -AsPlainText -Force)
```

For detailed syntax and parameter information, see New-Mailbox and Set-Mailbox.

3. In Exchange Online PowerShell, configure the following settings on the room mailbox to improve the meeting experience:

   - AutomateProcessing: AutoAccept (Meeting organizers receive the room reservation decision directly without human intervention: free = accept; busy = decline.)
   - AddOrganizerToSubject: $false (The meeting organizer is not added to the subject of the meeting request.)
   - DeleteComments: $false (Keep any text in the message body of incoming meeting requests.)
   - DeleteSubject: $false (Keep the subject of incoming meeting requests.)
   - RemovePrivateProperty: $false (Ensures the private flag that was sent by the meeting organizer in the original meeting request remains as specified.)
   - AddAdditionalResponse: $true (The text specified by the AdditionalResponse parameter is added to meeting requests.)
   - AdditionalResponse: "This is a Skype Meeting room!" (The additional text to add to the meeting request.)

   This example configures these settings on the room mailbox named Rigel-01.

```
Set-CalendarProcessing -Identity "Rigel-01" -AutomateProcessing AutoAccept -AddOrganizerToSubject $false
-DeleteComments $false -DeleteSubject $false -RemovePrivateProperty $false -AddAdditionalResponse $true
-AdditionalResponse "This is a Skype Meeting room!"
```

   For detailed syntax and parameter information, see Set-CalendarProcessing.

4. Connect to MS Online PowerShell to make Active Directory settings by running the `Connect-MsolService -Credential $cred` powershell cmdlet. For details about Active Directory, see Azure ActiveDirectory (MSOnline) 1.0.

> **NOTE**
>
> Azure Active Directory PowerShell 2.0 is not supported.

5. If you do not want the password to expire, use the following syntax:

```
Set-MsolUser -UserPrincipalName <upn> -PasswordNeverExpires $true
```

This example sets the password for the account Rigel1@contoso.onmicrosoft.com to never expire.

```
$acctUpn="Rigel1@contoso.onmicrosoft.com"
Set-MsolUser -UserPrincipalName $acctUpn -PasswordNeverExpires $true
```

You can also set a phone number for the account by running the following command:

```
Set-MsolUser -UserPrincipalName <upn> -PhoneNumber <phone number>
```

6. The device account needs to have a valid Microsoft 365 or Office 365 license, or Exchange and Microsoft Teams or Skype for Business will not work. If you have the license, you need to assign a usage location to your device account—this determines what license SKUs are available for your account. You can use `Get-MsolAccountSku` to retrieve a list of available SKUs for your Microsoft 365 or Office 365 organization as follows:

```
Get-MsolAccountSku
```

Next, you can add a license using the `Set-MsolUserLicense` cmdlet. In this case, $strLicense is the SKU code that you see (for example, contoso:STANDARDPACK).

```
$acctUpn="Rigel1@contoso.onmicrosoft.com"
Set-MsolUser -UserPrincipalName $acctUpn -UsageLocation "US"
Get-MsolAccountSku
Set-MsolUserLicense -UserPrincipalName $acctUpn -AddLicenses $strLicense
```

For detailed instructions, see Assign licenses to user accounts with Office 365 PowerShell.

7. Next, you need to enable the device account with Skype for Business. Be sure your environment meets the requirements defined in Microsoft Teams Rooms requirements.

Start a remote Windows PowerShell session as follows (be sure to install Skype for Business Online PowerShell components):

> **NOTE**
>
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module.
>
> If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
Import-Module -Name MicrosoftTeams
$cssess=New-CsOnlineSession -Credential $cred
Import-PSSession $cssess -AllowClobber
```

Next, enable your Microsoft Teams Rooms account for Skype for Business Server by running the following cmdlet:

```
$rm="Rigel1@contoso.onmicrosoft.com"
Enable-CsMeetingRoom -Identity $rm -RegistrarPool "sippoolbl20a04.infra.lync.com" -SipAddressType EmailAddress
```

Obtain the RegistrarPool information from the new user account being setup, as shown in this example:

```
``` Powershell
$rm="Rigel1@contoso.onmicrosoft.com"
Get-CsOnlineUser -Identity $rm | Select -Expand RegistrarPool
```

> [!NOTE]
> New user accounts might not be created on the same registrar pool as existing user accounts in the tenant. The command above will prevent errors in account setup due to this situation.
```

Assign a license to your account

1. Login as a tenant administrator, open the Microsoft 365 admin center, and click on the Admin app.
2. Click **Users and Groups** and then click **Add users, reset passwords, and more**.
3. Select the Microsoft Teams Rooms account, and then click or tap the pen icon, which means edit.
4. Click on the **Licenses** option.
5. In the **Assign licenses** section, you need to select Skype for Business Online (Plan 2) or Skype for Business Online (Plan 3), depending on your licensing and what you've decided in terms of needing Enterprise Voice. You'll have to use a Plan 3 license if you want to use Cloud PBX on Microsoft Teams Rooms. Minimally you will need CloudPBX for voice connectivity. Then configure hybrid voice or PSTN calling based on the PSTN connectivity method. See Microsoft Teams Rooms licenses for more details.
6. Click **Save** to complete the task.

Sample: Room account setup in Exchange Online and Skype for Business Online

Exchange Online PowerShell commands:

```
New-Mailbox -MicrosoftOnlineServicesID Rigel1@contoso.onmicrosoft.com -Alias rigel1 -Name "Rigel 1" -Room -
EnableRoomMailboxAccount $true -RoomMailboxPassword (ConvertTo-SecureString -String '<Password>' -AsPlainText
-Force)

Set-CalendarProcessing -Identity rigel1 -AutomateProcessing AutoAccept -AddOrganizerToSubject $false -
DeleteComments $false -DeleteSubject $false -RemovePrivateProperty $false -AddAdditionalResponse $true
-AdditionalResponse "This is a Rigel room!"
```

Azure Active Directory PowerShell commands:

```
Set-MsolUser -UserPrincipalName rigel1@contoso.onmicrosoft.com -PasswordNeverExpires $true -UsageLocation "US"
Set-MsolUserLicense -UserPrincipalName rigel1@contoso.onmicrosoft.com -AddLicenses
"sfblab:O365_BUSINESS_PREMIUM"
Set-MsolUserLicense -UserPrincipalName rigel1@contoso.onmicrosoft.com -AddLicenses "sfblab:MCOEV"
Set-MsolUserLicense -UserPrincipalName rigel1@contoso.onmicrosoft.com -AddLicenses "sfblab:MCOPSTN2"
```

Skype for Business PowerShell command:

```
Enable-CsMeetingRoom -Identity rigel1@contoso.onmicrosoft.com -RegistrarPool sippooldm21a05.infra.lync.com
-SipAddressType EmailAddress
```

> **NOTE**
>
> This adds CloudPBX and PSTNCallingDomesticAndInternational. Additionally, you will need to use the Admin interface to assign a phone number.

Validate

For validation, you should be able to use any Skype for Business client to sign in to the account you created.

See also

Configure accounts for Microsoft Teams Rooms

Plan for Microsoft Teams Rooms

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Microsoft Teams Rooms Licensing

Deploy Microsoft Teams Rooms with Skype for Business Server

4/27/2020 • 2 minutes to read • Edit Online

This topic explains how you add a device account for Microsoft Teams Rooms when you have a single-forest, on-premises deployment.

If you have a single-forest, on-premises deployment with Exchange 2013 SP1 or later and Skype for Business Server 2015 or later, then you can use the provided Windows PowerShell scripts to create device accounts. If you're using a multi-forest deployment, you can use equivalent cmdlets that will produce the same results. Those cmdlets are described in this section.

Before you begin to deploy Microsoft Teams Rooms, be sure you have the right permissions to run the associated cmdlets.

```
Set-ExecutionPolicy Unrestricted
$org='contoso.com'
$cred=Get-Credential $admin@$org
$sessExchange = New-PSSession -ConfigurationName microsoft.exchange -Credential $cred -AllowRedirection -
Authentication Kerberos -ConnectionUri
"http://$strExchangeServer/powershell" -WarningAction SilentlyContinue
$sessLync = New-PSSession -Credential $cred -ConnectionURI "https://$strLyncFQDN/OcsPowershell" -
AllowRedirection -WarningAction SilentlyContinue
Import-PSSession $sessExchange
Import-PSSession $sessLync
```

Note that $strExchangeServer is the fully qualified domain name (FQDN) of your Exchange server, and $strLyncFQDN is the FQDN of your Skype for Business Server deployment.

2. After establishing a session, you'll either create a new mailbox and enable it as a RoomMailboxAccount, or change the settings for an existing room mailbox. This will allow the account to authenticate to Microsoft Teams Rooms.

   If you're changing an existing resource mailbox:

   ```
   Set-Mailbox -Identity 'PROJECTRIGEL01' -EnableRoomMailboxAccount $true -RoomMailboxPassword (ConvertTo-
   SecureString -String <password>
   -AsPlainText -Force)
   ```

   If you're creating a new resource mailbox:

   ```
   New-Mailbox -UserPrincipalName PROJECTRIGEL01@contoso.com -Alias PROJECTRIGEL01 -Name "Project-Rigel-01"
   -Room
   -EnableRoomMailboxAccount $true -RoomMailboxPassword (ConvertTo-SecureString -String <password> -
   AsPlainText -Force)
   ```

3. You can set various Exchange properties on the device account to improve the meeting experience for people. You can see which properties need to be set in the Exchange properties section.

```
Set-CalendarProcessing -Identity $acctUpn -AutomateProcessing AutoAccept -AddOrganizerToSubject $false -
AllowConflicts $false -DeleteComments
$false -DeleteSubject $false -RemovePrivateProperty $false
Set-CalendarProcessing -Identity $acctUpn -AddAdditionalResponse $true -AdditionalResponse "This is a
Skype Meeting room!"
```

4. If you decide to have the password not expire, you can set that with Windows PowerShell cmdlets too. See Password management for more information.

   ```
   Set-AdUser $acctUpn -PasswordNeverExpires $true
   ```

5. Enable the account in Active Directory so it will authenticate to Microsoft Teams Rooms.

   ```
   Set-AdUser $acctUpn -Enabled $true
   ```

6. Enable the device account with Skype for Business Server by enabling your Microsoft Teams Rooms Active Directory account on a Skype for Business Server pool:

   ```
   Enable-CsMeetingRoom -SipAddress sip:PROJECTRIGEL01@contoso.com -DomainController DC-ND-001.contoso.com
   -RegistrarPool LYNCPool15.contoso.com -Identity PROJECTRIGEL01
   ```

   You'll need to use the Session Initiation Protocol (SIP) address and domain controller for the Project

7. **Optional.** You can also allow Microsoft Teams Rooms to make and receive public switched telephone network (PSTN) phone calls by enabling Enterprise Voice for your account. Enterprise Voice isn't a requirement for Microsoft Teams Rooms, but if you want PSTN dialing functionality for the Microsoft Teams Rooms client, here's how to enable it:

   ```
   Set-CsMeetingRoom PROJECTRIGEL01 -DomainController DC-ND-001.contoso.com -LineURI
   "tel:+14255550555;ext=50555"
   Set-CsMeetingRoom -DomainController DC-ND-001.contoso.com -Identity PROJECTRIGEL01 -
   EnterpriseVoiceEnabled $true
   Grant-CsVoicePolicy -PolicyName VP1 -Identity PROJECTRIGEL01
   Grant-CsDialPlan -PolicyName DP1 -Identity PROJECTRIGEL01
   ```

   Again, you'll need to replace the provided domain controller and phone number examples with your own information. The parameter value $true stays the same.

Sample: room account setup in Exchange and Skype for Business Server on premises

```
New-Mailbox -Alias rigel1 -Name "Rigel 1" -Room -EnableRoomMailboxAccount $true -RoomMailboxPassword
(ConvertTo-SecureString -String "" -AsPlainText -Force)
-UserPrincipalName rigel1@contoso.com

Set-CalendarProcessing -Identity rigel1 -AutomateProcessing AutoAccept -AddOrganizerToSubject $false -
AllowConflicts $false -DeleteComments $false -DeleteSubject $false
-RemovePrivateProperty $false
Set-CalendarProcessing -Identity rigel1 -AddAdditionalResponse $true -AdditionalResponse "This is a Skype
Meeting room!"

Enable-CsMeetingRoom -Identity rigel1@contoso.com -RegistrarPool cs3.contoso.com -SipAddressType EmailAddress
Set-CsMeetingRoom -Identity rigel1 -EnterpriseVoiceEnabled $true -LineURI tel:+155555555555
Grant-CsVoicePolicy -PolicyName dk -Identity rigel1
Grant-CsDialPlan -PolicyName e15dp2.contoso.com -Identity rigel1
```

Related topics

Configure accounts for Microsoft Teams Rooms

Plan for Microsoft Teams Rooms

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Deploy Microsoft Teams Rooms with Exchange Online

9/15/2020 • 6 minutes to read • Edit Online

Read this topic for information on how to deploy Microsoft Teams Rooms with Exchange Online and Skype for Business Server on-premises.

If your organization has a mix of services, with some hosted on premises and some hosted online, then your configuration will depend on where each service is hosted. This topic covers hybrid deployments for Microsoft Teams Rooms with Exchange hosted online. Because there are so many different variations in this type of deployment, it's not possible to provide detailed instructions for all of them. The following process will work for many configurations. If the process isn't right for your setup, we recommend that you use Windows PowerShell to achieve the same end result as documented here, and for other deployment options.

The easiest way to set up user accounts is to configure them using remote Windows PowerShell. Microsoft provides SkypeRoomProvisioningScript.ps1, a script that will help create new user accounts, or validate existing resource accounts you have in order to help you turn them into compatible Microsoft Teams Rooms user accounts. If you prefer, you can follow the steps below to configure accounts your Microsoft Teams Rooms device will use.

Requirements

Before you deploy Microsoft Teams Rooms with Exchange Online, be sure you have met the requirements. For more information, see Microsoft Teams Rooms requirements.

To deploy Microsoft Teams Rooms with Exchange Online, follow the steps below. Be sure you have the right permissions to run the associated cmdlets.

> **NOTE**
> The Azure Active Directory Module for Windows PowerShell cmdlets in this section (for example, Set-MsolUser) have been tested in setting up accounts for Microsoft Teams Rooms devices. It's possible that other cmdlets may work, however, they haven't been tested in this specific scenario.

If you deployed Active Directory Federation Services (AD FS), you may have to convert the user account to a managed user before you follow these steps, and then convert the user back to a federated user after you complete these steps.

Create an account and set Exchange properties

1. Start a remote Windows PowerShell session on a PC and connect to Exchange Online as follows:

```
Set-ExecutionPolicy Unrestricted
$org = 'contoso.microsoft.com'
$cred = Get-Credential $admin@$org
$sess = New-PSSession -ConfigurationName Microsoft.Exchange -ConnectionUri
https://outlook.office365.com/powershell-liveid/ -Credential $cred -Authentication Basic -
AllowRedirection
Import-PSSession $sess -DisableNameChecking
```

2. After establishing a session, you'll either create a new mailbox and enable it as a RoomMailboxAccount, or change the settings for an existing room mailbox. This will allow the account to authenticate into Microsoft

Teams Rooms.

If you're changing an existing resource mailbox:

```
Set-Mailbox -Identity 'PROJECT01' -EnableRoomMailboxAccount $true -RoomMailboxPassword (ConvertTo-
SecureString -String <password> -AsPlainText -Force)
```

If you're creating a new resource mailbox:

```
New-Mailbox -MicrosoftOnlineServicesID 'PROJECT01@contoso.com' -Alias PROJECT01 -Name "Project--01" -
Room -EnableRoomMailboxAccount $true -RoomMailboxPassword (ConvertTo-SecureString -String <password> -
AsPlainText -Force)
```

3. To improve the meeting experience, you'll need to set the Exchange properties on the user account as follows:

```
Set-CalendarProcessing -Identity 'PROJECT01@contoso.com' -AutomateProcessing AutoAccept -
AddOrganizerToSubject $false -AllowConflicts $false -DeleteComments $false -DeleteSubject $false -
RemovePrivateProperty $false
Set-CalendarProcessing -Identity 'PROJECT01@contoso.com' -AddAdditionalResponse $true -
AdditionalResponse "This is a Skype Meeting room!"
```

Add an email address for your on-premises domain account

1. In **Active Directory Users and Computers AD** tool, right-click on the container or Organizational Unit that your Microsoft Teams Rooms accounts will be created in, click **New**, and then click **User**.
2. Type the display name (- Identity) from the prior cmdlet (Set-Mailbox or New-Mailbox) into the **Full name** box, and the alias into the **User logon name** box. Click **Next**.
3. Type the password for this account. You'll need to retype it for verification. Make sure the **Password never expires** checkbox is the only option selected.

> **NOTE**
> Selecting **Password never expires** is a requirement for Skype for Business Server on Microsoft Teams Rooms. Your domain rules may prohibit passwords that don't expire. If so, you'll need to create an exception for each Microsoft Teams Rooms user account.

4. Click **Finish** to create the account.
5. After you have created the account, run a directory synchronization. This can be accomplished by using Set-MsolDirSyncConfiguration in PowerShell. When that is complete, go to the users page and verify that the two accounts created in the previous steps have merged.

Assign a Microsoft 365 or Office 365 license

1. First, connect to Azure AD to apply some account settings. You can run this cmdlet to connect. For details about Active Directory, see Azure ActiveDirectory (MSOnline) 1.0.

> **NOTE**
> Azure Active Directory PowerShell 2.0 is not supported.

```
Connect-MsolService -Credential $cred
```

2. The user account needs to have a valid Microsoft 365 or Office 365 license to ensure that Exchange and Skype for Business Server will work. If you have the license, you need to assign a usage location to your user account—this determines what license SKUs are available for your account. You'll make the assignment in a following step.

3. Next, use `Get-MsolAccountSku` to retrieve a list of available SKUs for your Microsoft 365 or Office 365 organization.

4. Once you list out the SKUs, you can add a license using the `Set-MsolUserLicense` cmdlet. In this case, $strLicense is the SKU code that you see (for example, contoso:STANDARDPACK).

```
Set-MsolUser -UserPrincipalName 'PROJECT01@contoso.com' -UsageLocation 'US'
 Get-MsolAccountSku
 Set-MsolUserLicense -UserPrincipalName 'PROJECT01@contoso.com' -AddLicenses $strLicense
```

Enable the user account with Skype for Business Server

1. Create a remote Windows PowerShell session from a PC as follows:

> **NOTE**
>
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module.
>
> If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
``` Powershell
Import-Module -Name MicrosoftTeams
$cred = Get-Credential
$cssess = New-CsOnlineSession -Credential $cred
Import-PSSession $cssess -AllowClobber
```
```

2. To enable your Microsoft Teams Rooms account for Skype for Business Server, run this command:

```
Enable-CsMeetingRoom -Identity $rm -RegistrarPool 'sippoolbl20a04.infra.lync.com' -SipAddressType
EmailAddress
```

   If you aren't sure what value to use for the RegistrarPool parameter in your environment, you can get the value from an existing Skype for Business Server user using this command

```
Get-CsUser -Identity 'alice@contoso.com'| fl *registrarpool*
```

Assign a Skype for Business Server license to your Microsoft Teams Rooms account

1. Log in as a tenant administrator, open the Microsoft 365 admin center, and click on the Admin app.
2. Click on **Users and Groups** and then click **Add users, reset passwords, and more**.
3. Click the Microsoft Teams Rooms account, and then click the pen icon to edit the account information.
4. Click **Licenses**.
5. In **Assign licenses**, select Skype for Business (Plan 2) or Skype for Business (Plan 3), depending on your licensing and Enterprise Voice requirements. You'll have to use a Plan 3 license if you want to use Enterprise Voice on Microsoft Teams Rooms.
6. Click **Save**.

For validation, you should be able to use any Skype for Business client to log in to this account.

NOTE

If you're currently using E1, E3, E4, or E5 SKUs with Skype for Business Plan 2 with Audio Conferencing or with Phone System and a Calling Plan, these will continue to work. However, you should consider moving to a simpler licensing model as described in Teams Meeting Room Licensing Update, after current licenses expire.

IMPORTANT

If you're using Skype for Business Plan 2, you can only use the Microsoft Teams Rooms in Skype for Business Only mode, meaning all of your meetings will be Skype for Business meetings. In order to enable your meeting room for Microsoft Teams meetings, we recommend you purchase the Meeting Room license.

Related topics

Configure accounts for Microsoft Teams Rooms

Plan for Microsoft Teams Rooms

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Deploy Microsoft Teams Rooms with Exchange on premises

9/15/2020 • 6 minutes to read • Edit Online

Read this topic for information on how to deploy Microsoft Teams Rooms in a hybrid environment with Exchange on premises and Microsoft Teams or Skype for Business Online.

If your organization has a mix of services, with some hosted on premises and some hosted online, then your configuration will depend on where each service is hosted. This topic covers hybrid deployments for Microsoft Teams Rooms with Exchange hosted on premises. Because there are so many different variations in this type of deployment, it's not possible to provide detailed instructions for all of them. The following process will work for many configurations. If the process isn't right for your setup, we recommend that you use Windows PowerShell to achieve the same end result as documented here, and for other deployment options.

Microsoft provides SkypeRoomProvisioningScript.ps1, a script that will help create new user accounts, or validate existing resource accounts you have in order to help you turn them into compatible Microsoft Teams Rooms user accounts. If you prefer, you can follow the steps below to configure accounts your Microsoft Teams Rooms device will use.

Requirements

Before you deploy Microsoft Teams Rooms with Exchange on premises, be sure you have met the requirements. For more information, see Microsoft Teams Rooms requirements.

If you are deploying Microsoft Teams Rooms with Exchange on premises, you will be using Active Directory administrative tools to add an email address for your on-premises domain account. This account will be synced to Microsoft 365 or Office 365. You will need to:

- Create an account and synchronize the account with Active Directory.
- Enable the remote mailbox and set properties.
- Assign an Microsoft 365 or Office 365 license.
- Enable the device account with Skype for Business Server. To enable the device account your environment will need to meet the following prerequisites:
  - You'll need to have Skype for Business Online (Plan 2) or higher in your Microsoft 365 or Office 365 plan. The plan needs to support conferencing capability.
  - If you need Enterprise Voice (PSTN telephony) using telephony service providers for Microsoft Teams Rooms you need Skype for Business Online (Plan 3).
  - Your tenant users must have Exchange mailboxes.
  - Your Microsoft Teams Rooms account does require a Skype for Business Online (Plan 2) or Skype for Business Online (Plan 3) license, but it does not require an Exchange Online license.
- Assign a Skype for Business Server license to your Microsoft Teams Rooms account.

Create an account and synchronize with Active Directory

1. In the **Active Directory Users and Computers** tool, right-click on the folder or Organizational Unit that your Microsoft Teams Rooms accounts will be created in, click **New**, and then click **User**.

2. Type the display name from the previous cmdlet into the **Full name** box, and the alias into the **User logon name** box. Click **Next**.

3. Type the password for this account. You'll need to retype it for verification. Make sure the **Password never expires** checkbox is the only option selected.

   > **NOTE**
   > Selecting **Password never expires** is a requirement for Skype for Business Server on Microsoft Teams Rooms. Your domain rules may prohibit passwords that don't expire. If so, you'll need to create an exception for each Microsoft Teams Rooms device account.

4. After you've created the account, run a directory synchronization. When it's complete, go to the users page in your Microsoft 365 admin center and verify that the account created in the previous steps has merged to online.

Enable the remote mailbox and set properties

1. Open the Exchange Management Shell or connect to your Exchange server using remote PowerShell.

2. In Exchange PowerShell, create a mailbox for the account (mailbox-enable the account) by running the following command:

   ```
   Enable-Mailbox PROJECTRIGEL01@contoso.com -Room
   ```

   For detailed syntax and parameter information, see Enable-Mailbox.

3. In Exchange PowerShell, configure the following settings on the room mailbox to improve the meeting experience:

   - AutomateProcessing: AutoAccept (Meeting organizers receive the room reservation decision directly without human intervention: free = accept; busy = decline.)
   - AddOrganizerToSubject: $false (The meeting organizer is not added to the subject of the meeting request.)
   - DeleteComments: $false (Keep any text in the message body of incoming meeting requests.)
   - DeleteSubject: $false (Keep the subject of incoming meeting requests.)
   - RemovePrivateProperty: $false (Ensures the private flag that was sent by the meeting organizer in the original meeting request remains as specified.)
   - AddAdditionalResponse: $true (The text specified by the AdditionalResponse parameter is added to meeting requests.)
   - AdditionalResponse: "This is a Skype Meeting room!" (The additional text to add to the meeting request.)

   This example configures these settings on the room mailbox named Project-Rigel-01.

   ```
   Set-CalendarProcessing -Identity "Project-Rigel-01" -AutomateProcessing AutoAccept -
   AddOrganizerToSubject $false -DeleteComments $false -DeleteSubject $false -RemovePrivateProperty $false
   -AddAdditionalResponse $true -AdditionalResponse "This is a Skype Meeting room!"
   ```

   For detailed syntax and parameter information, see Set-CalendarProcessing.

Assign a Microsoft 365 or Office 365 license

1. Connect to Azure Active Directory. For details about Active Directory, see Azure ActiveDirectory (MSOnline) 1.0.

   > **NOTE**
   > Azure Active Directory PowerShell 2.0 is not supported.

2. The device account needs to have a valid Microsoft 365 or Office 365 license, or Exchange and Microsoft Teams will not work. If you have the license, you need to assign a usage location to your device account—this determines what license SKUs are available for your account. You can use `Get-MsolAccountSku` to retrieve a list of available SKUs.

3. Next, you can add a license using the `Set-MsolUserLicense` cmdlet. In this case, $strLicense is the SKU code that you see (for example, contoso:STANDARDPACK).

```
Set-MsolUser -UserPrincipalName 'PROJECTRIGEL01@contoso.com' -UsageLocation 'US'
Get-MsolAccountSku
Set-MsolUserLicense -UserPrincipalName 'PROJECTRIGEL01@contoso.com' -AddLicenses $strLicense
```

For detailed instructions, see Assign licenses to user accounts with Office 365 PowerShell.

Enable the device account

Skype for Business Online PowerShell is used to manage services for both Microsoft Teams and Skype for Business Online.

1. Create a remote Windows PowerShell session from a PC as follows:

> **NOTE**
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module.
>
> If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
Import-Module -Name MicrosoftTeams
$cssess=New-CsOnlineSession -Credential $cred
Import-PSSession $cssess -AllowClobber
```

2. Obtain SIP address of the account:

```
$rm = Get-Csonlineuser -identity <insert SIP address> | select -expandproperty sipaddress
```

3. To enable your Microsoft Teams Rooms account, run this command:

```
Enable-CsMeetingRoom -Identity $rm -RegistrarPool'sippoolbl20a04.infra.lync.com' -SipAddressType
EmailAddress
```

   If you aren't sure what value to use for the RegistrarPool parameter in your environment, you can get the value from an existing user using this command:

```
Get-CsOnlineUser -Identity 'alice@contoso.com'| fl *registrarpool*
```

Assign a license to your Microsoft Teams Rooms account

1. Log in as a tenant administrator, open the Microsoft 365 admin center, and click on the Admin app.
2. Click on **Users and Groups** and then click **Add users, reset passwords, and more**.
3. Click the Microsoft Teams Rooms account, and then click the pen icon to edit the account information.
4. Click **Licenses**.
5. In **Assign licenses**, select Skype for Business (Plan 2) or Skype for Business (Plan 3), depending on your licensing and Enterprise Voice requirements. You'll have to use a Plan 3 license if you want to use Enterprise Voice on your Microsoft Teams Rooms.
6. Click **Save**.

For validation, you should be able to use any client to log in to this account.

Related topics

Configure accounts for Microsoft Teams Rooms

Plan for Microsoft Teams Rooms

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

4/27/2020 • 8 minutes to read • Edit Online

This article describes how to set up the Microsoft Teams Rooms console and its peripherals.

You should only perform these steps if the necessary Microsoft Teams or Skype for Business and Exchange accounts have already been created and tested as described in Deploy Microsoft Teams Rooms. You will need the hardware and software described in Microsoft Teams Rooms requirements. This topic contains the following sections:

- Prepare the installation media
- Install a private CA certificate on the console
- Install Windows 10 and the Microsoft Teams Rooms console app
- Initial set up of the console
- Microsoft Teams Rooms deployment checklist

> **NOTE**
> Microsoft Teams Rooms will only work in a properly configured Microsoft Teams or Skype for Business environment where the device accounts are set up correctly as described in Deploy Microsoft Teams Rooms.

Prepare the installation media

Installing the Microsoft Teams Rooms console app requires a USB storage device with at least 32GB of capacity. There should be no other files on the device; any existing files on the USB storage will be lost.

> **NOTE**
> Failure to create your Microsoft Teams Rooms installation media according to these instructions will likely result in unexpected behavior.

> **NOTE**
> The process below is for creating installation media to image new Microsoft Teams Rooms devices. Existing devices, by default, update automatically from Windows Update and the Windows Store.

> **IMPORTANT**
> The Windows 10 machine used to create the Microsoft Teams Rooms installation media must be on the same or later version of Windows as the target installation media.

1. Download the CreateSrsMedia.ps1 script.
2. Run the CreateSrsMedia.ps1 script from an elevated prompt on a Windows 10 machine.
3. Follow the script's instructions to create a Microsoft Teams Rooms USB setup disk.

TIP

Each time the CreateSrsMedia.ps1 script starts, the screen output will include the name of a log file or transcript for the session. If there are issues with running the script, make sure to have a copy of that transcript available when requesting support.

The CreateSrsMedia.ps1 script automates the following tasks:

1. Download the latest MSI installer for Microsoft Teams Rooms.
2. Determine the build of Windows that the user must supply. The most recently released versions may or may not be tested and supported for use with Microsoft Teams Rooms devices.
3. Download necessary supporting components.
4. Assemble the needed components on the installation media.

A specific version of Windows 10 is required, and this version is only available to volume licensing customers. You can get a copy from the Volume Licensing Service Center.

When finished, remove the USB disk from your computer and proceed to Install Windows 10 and the Microsoft Teams Rooms console app.

Install Windows 10 and the Microsoft Teams Rooms console app

You now need to apply the setup media you've created. The target device will run as an appliance and the default user will be set to only run the Microsoft Teams Rooms console app.

1. If the target device will be installed in a dock (e.g., a Surface Pro), disconnect it from the dock.
2. Ensure the target device is not connected to the network.
3. Ensure the target device is connected to AC power.
4. Plug your USB setup disk into the target device.
5. Boot to the USB setup disk. Refer to the manufacturer instructions. If your target device is a Surface Pro, use the following steps to boot to the USB setup disk:

   a. Press and continue to hold the volume down (-) button.

   b. Press and release the power button.

   c. Once Windows setup is booted, release the volume down (-) button.
6. The system will shut down once installation is complete.

After the system has shut down, it is safe to remove the USB setup disk. At this point, you can place the target device in its dock (if using a dock-based product), attach the peripherals needed for your meeting room, and connect to the network. Refer to the manufacturer instructions.

NOTE

Software updates for Microsoft Teams Rooms are automatically downloaded from the Microsoft Store for Business. See Prerequisites for Microsoft Store for Business and Education to verify that the room console will be able to access the store and self-update.

Selecting a language

In Creator's Update, you will need to use the ApplyCurrentRegionAndLanguage.ps1 script in scenarios where implicit language selection does not provide the user with the actual application language they want (e.g., they

want the console app to come up in French, but it's coming up in English).

> **NOTE**
> The following instructions work only for consoles created using Windows Creator's Update. Legacy/in-market systems that have not been set up using media with the new provisioning system will not be able to use these instructions, but should also not suffer from the initial issue that requires this manual intervention (Anniversary Edition let you pick your app language explicitly as part of setup).

To apply your desired language

1. Switch to Admin mode.
2. Select the Start menu.
3. Select the gear icon to launch the **Settings** app.
4. Select **Time & language**.
5. Select **Region & language**.
6. Select **Add a language**.
7. Select the language you wish to add.
8. Select the language you just added to the "Languages" list.
9. Select **Set as default**.
10. For any languages you wish to remove:

    a. Select the language you wish to remove.

    b. Select **Remove**.
11. Start an elevated command prompt.
12. Run the following command:

```
powershell -executionpolicy unrestricted c:\Rigel\x64\scripts\provisioning\scriptlaunch.ps1
ApplyCurrentRegionAndLanguage.ps1
```

13. Restart the system.

Your desired language is now applied to the Microsoft Teams Rooms console.

Initial set up of the console

After Windows is installed, the Microsoft Teams Rooms console app will go into its initial Setup process when it is started next or if the /reboot option was chosen.

1. The User Account screen appears. Enter the Skype sign-in address (in user@domain format) of the room account to be used with the console.
2. Enter the password for the room account, and re-enter it to verify.
3. Under "Configure Domain," set the FQDN for the Skype for Business Server. If the Skype for Business SIP domain is different from the Exchange domain of the user, enter the Exchange domain in this field.
4. Click **Next**.

5. Select the indicated devices on the Features screen and click **Next**. The default is to have Auto Screen sharing set to On and Hide meeting names set to Off. The devices to select are:

   - Microphone for Conferencing: the default microphone for this conference room.
   - Speaker for Conferencing: the default speaker for conferencing.
   - Default Speaker: the speaker used for audio from the HDMI ingest.

     Each item has a drop-down menu of options to select from. You must make a selection for each device.

6. Click **Finish**.

The Microsoft Teams Rooms console app should immediately start signing in to Skype for Business Server with the credentials entered above, and should also begin syncing its calendar with Exchange using those same credentials. For details on using the console app, refer to the Microsoft Teams Rooms help.

> **IMPORTANT**
> Microsoft Teams Rooms relies on the presence of certified console hardware. Even a correctly created image containing the Microsoft Teams Rooms console app will not boot past the initial setup procedure unless the console hardware is detected. For Surface Pro based solutions, the Surface Pro must be connected to its accompanying dock hardware to pass this check.

> **NOTE**
> Some non-English language users may need a physical keyboard connected to the console during initial setup in the event that symbols are not supported on the touch keyboard.

Install a private CA certificate on the console

The Microsoft Teams Rooms console needs to trust the certificates used by the servers it connects to. For O365 this is done automatically, since these servers are using public Certificate Authorities and these are automatically trusted by Windows 10. In a case where the Certificate Authority is private, for instance an on-premises deployment with Active Directory and the Windows Certificate Authority, you can add the certificate to the Microsoft Teams Rooms console in a couple of ways:

- You can join the console to Active Directory and that will automatically add the required certificates given the Certificate Authority is published to Active Directory (normal deployment option).
- You can install the certificate manually after the imaging process. Before you do this, you must complete Initial set up of the console.

To manually install the certificate

1. Download the CA certificate to your computer and save it to "C:\Skype Room Systems\x64\Scripts\Provisioning\CAcertificate.cer".
2. Place the console in admin mode (see Admin mode and device management).
3. Run the following command:

```
certutil -addstore -f -enterprise root "C:\Skype Room
Systems\x64\Scripts\Provisioning\CAcertificate.cer"
```

Join an Active Directory domain (Optional)

You can join Microsoft Teams Rooms consoles to your domain. Microsoft Teams Rooms consoles should be placed in a separate OU from your PC workstations because many workstation policies are not compatible with Microsoft Teams Rooms. A common example are password enforcement policies that will prevent Microsoft Teams Rooms from starting up automatically. For information about the management of GPO settings, please refer to Manage Microsoft Teams Rooms.

To join Microsoft Teams Rooms to a domain

1. Sign into the console from the admin account (see Admin mode and device management).
2. Launch elevated Powershell command prompt.
3. Enter the following command in Powershell:

```
Add-Computer -DomainName <Fully qualified domain> -OUPath "OU=<Child OU>, … ,OU=<Top level OU>,DC=
<child domain>,…,DC=<top level domain>"
```

For example, if your fully qualified domain is redmond.corp.microsoft.com and you want your Microsoft Teams Rooms consoles to be in a "Microsoft Teams Rooms" OU that is a child of a "Resources" OU, the command will be:

```
Add-Computer -DomainName redmond.corp.microsoft.com -OUPath
"OU=Microsoft_Teams_Rooms,OU=Resources,DC=redmond,DC=corp,DC=microsoft,DC=com"
```

If you would like to rename the computer when joining it to a domain, use the -NewName flag followed by the computer's new name.

Microsoft Teams Rooms deployment checklist

Use the following checklist while doing a final verification that the console and all its peripherals are fully configured:

Application settings

☐	Room account name and phone # (if PSTN enabled) are correctly displayed in top right of console screen
☐	Windows computer name is set correctly (useful for remote administration)
☐	Administrator account password set and verified
☐	All firmware updates have been applied

Audio/video peripherals

☐	Camera peripheral firmware version is correct (if applicable)
☐	Camera functional and positioned optimally
☐	Settings for Playback Default Device and Playback Default Communications Device set to intended audio peripheral

☐	Settings for Recording Default Communication Device set to the intended audio peripheral
☐	Audio peripheral firmware version is correct (if applicable)
☐	Audio input device functional and optimally positioned
☐	Audio output device functional and optimally positioned

Dock

☐	Cables are secure and not pinched
☐	Audio ingest over HDMI is functional
☐	Video ingest over HDMI is functional
☐	Dock can swivel freely
☐	Display brightness is acceptable for environment

See also

Plan for Microsoft Teams Rooms

Deploy Microsoft Teams Rooms

Configure a Microsoft Teams Rooms console

Manage Microsoft Teams Rooms

Authentication in Microsoft Teams Rooms

9/29/2020 • 5 minutes to read • Edit Online

Account management for Microsoft Teams Rooms devices is handled at the application level. The application connects to Microsoft Teams, Skype for Business, and Exchange to get resources for the room account to enable calling and meeting experiences. The device is kept account agnostic to allow for always-on capabilities, calling scenarios (for devices configured with a Calling Plan), and custom lockdown mechanisms implemented on these devices. This means that authentication for these devices happen in a different way than for end-user devices.

Modern authentication is recommended for all customers using Microsoft Teams Rooms devices with Microsoft 365 or Office 365. If you have an on-premises deployment of Exchange server or Skype for Business server, configure hybrid modern authentication with Azure Active Directory (Azure AD) to enable using modern authentication.

Modern authentication is supported on Microsoft Teams Rooms version 4.4.25.0 and later.

Modern authentication

When you use modern authentication with the Microsoft Teams Rooms application, Active Directory Authentication Library (ADAL) is used to connect to Microsoft Teams, Exchange, and Skype for Business. A Microsoft Teams Rooms device is a shared device and performs a nightly reboot to ensure smooth functioning and to get critical operating system, driver, firmware, or application updates. The modern authentication mechanism uses the resource owner password credentials authorization grant type in OAuth 2.0, which doesn't require any user intervention. This is one of the key differences between how modern authentication works for user accounts versus resource accounts that are used by the Microsoft Teams Rooms application. Because of this, Microsoft Teams Rooms resource accounts shouldn't be configured to use multi-factor authentication (MFA), smart card authentication, or client certificate-based authentication (which are all available for end users).

The other key difference between how modern authentication works on Microsoft Teams Rooms devices and end-user devices is that you can't use a resource account to apply device-level conditional access policies in Azure Active Directory and Endpoint Manager as device info is not passed when using this grant type. Instead, you can enroll a device in Microsoft Endpoint Manager and apply compliance policies by using the guidance provided in Managing Teams Meeting Rooms with Intune.

Enable modern authentication on a Microsoft Teams Rooms device

For Microsoft Teams Rooms to use modern authentication with Skype for Business and Exchange, enable the client-side setting for modern authentication on the Microsoft Teams Rooms device. You can do this in the device settings or in the XML config file.

> **NOTE**
> Before you enable the client-side setting for modern authentication, make sure that your environment is set up correctly to use modern authentication.

Using device settings

1. On the Microsoft Team Rooms device, go to **More** (...).
2. Select **Settings**, and then enter the device administrator username and password.
3. Go to the **Account** tab, turn on **Modern Authentication**, and then select **Save and exit**.

Using the XML config file

In your SkypeSettings.xml file, set the modern authentication XML element to **True**, as follows.

```
<ModernAuthEnabled>True</ModernAuthEnabled>
```

To apply the setting, see Manage a Microsoft Teams Rooms console settings remotely with an XML configuration file.

Prepare your environment for modern authentication

Before you begin, make sure you understand the identity models to use with Office 365 and Azure AD. You can find more information at Office 365 identity models and Azure Active Directory and at Hybrid identity and directory synchronization for Microsoft 365 or Office 365.

Enable modern authentication in Microsoft 365 or Office 365

To turn on modern authentication for Exchange Online, see Enable modern authentication in Exchange Online. If you use Skype for Business Online, you should also make sure that modern authentication is turned on for Skype for Business Online. To learn more, see Skype for Business Online: Enable your tenant for modern authentication.

We recommended that you do not remove basic authentication policies for Exchange Online or disable basic authentication for your tenant until you have validated that Microsoft Teams Rooms devices can successfully sign in with Exchange Online, Teams, and Skype for Business Online.

For more information about disabling basic authentication in Exchange Online, see Disable Basic authentication in Exchange Online.

Hybrid modern authentication

To ensure successful authentication to your on-premises Exchange server and/or Skype for Business server, you must make sure the resource account that's used with Microsoft Teams Rooms is configured to get authorization from Azure AD.

Teams Rooms authentication flows vary depending on your authentication configuration. For customers using a managed domain, Teams Rooms uses OAuth 2.0 Resource Owner Password Credentials with Azure Active Directory. However, for customers using a federated domain, OAuth 2.0 SAML Bearer Assertion Flow is used.

> **NOTE**
>
> Your identity provider may need specific configurations or settings for integration with Azure Active Directory or Office 365. Contact your identity provider if you need help with configuring authentication with Teams Rooms.

Prerequisites specific to Microsoft Teams Rooms

The prerequisites to enable modern authentication in your hybrid topology are covered in Hybrid modern authentication overview and prerequisites for using it with on-premises Skype for Business and Exchange servers. All the prerequisites discussed in the article apply.

However, because Microsoft Teams Rooms uses resource owner password credentials authorization and the underlying REST APIs for modern authentication, the following are important differences to be aware of that are specific to Microsoft Teams Rooms.

- You must have Exchange Server 2016 CU8 or later, or Exchange Server 2019 CU1 or later.
- You must have Skype for Business Server 2015 CU5 or later, or Skype for Business Server 2019 or later.
- MFA isn't supported regardless of the topology you have.
- Microsoft Teams Rooms does not support SIP and UPN mismatch. You must create a Microsoft Teams Rooms

account with the same UPN and SIP for it to work.

- If you use a third-party authentication provider that's supported by Azure AD, it must support an active authentication flow through WS-Trust.
- Do not use device-level conditional access policies for a resource account configured with the application. Doing so will result in sign-in failures. Instead, enroll a device in Microsoft Intune and apply compliance policies by using the guidance published in Managing Teams Meeting Rooms with Intune.

Configure Exchange Server

To enable hybrid modern authentication in Exchange Server, see How to configure Exchange Server on-premises to use hybrid modern authentication.

Configure Skype for Business Server

To enable hybrid modern authentication with Skype for Business Server, see How to configure Skype for Business on-premises to use hybrid modern authentication.

Remove or disable Skype for Business and Exchange

If your setup doesn't allow for hybrid modern authentication or you need to remove or disable hybrid modern authentication for Exchange or Skype for Business, see Removing or disabling hybrid modern authentication from Skype for Business and Exchange.

Azure AD conditional access

You can configure a resource account used with Microsoft Teams Rooms for IP/location-based access. To learn more, see Conditional Access: Block access by location.

No other conditional access policies are supported. For more information about device compliance, see Managing Teams Meeting Rooms with Intune.

Enable Teams Room devices to join third-party meetings

7/22/2020 • 4 minutes to read • Edit Online

Microsoft Teams Rooms devices support a one-touch experience for joining third-party online meetings. When enabled, you can use a Teams Rooms device to join meetings hosted on Cisco WebEx and Zoom[1] just as easily as you can join meetings hosted in Microsoft Teams.

Before you can join third-party meetings from a Teams Rooms device, you need to do the following:

1. Configure the Teams Rooms device's Exchange Online room mailbox to process invites for third-party meetings
2. Make sure your organization doesn't have any policies that would prevent you from connecting to third-party meeting services
3. Configure your Teams Rooms devices to allow third-party meetings

The following sections show you how to do each of these steps.

Step 1: Allow calendar invite processing for third-party meetings

The first thing you need to do to enable a one-touch join experience from a Team Rooms device is set the calendar processing rules for the device's Exchange Online room mailbox. The room mailbox needs to allow external meetings and keep the message body and subject so it can see the URL needed to join the third-party meeting. To set these room mailbox options using the Set-CalendarProcessing cmdlet, do the following:

1. Connect to Exchange Online PowerShell. For more information, see Connect to Exchange Online Powershell with Basic authentication or Connect to Exchange Online PowerShell using multi-factor authentication, depending on your authentication method.

2. Get the User Principal Name (UPN) of the room mailbox if you don't know it by running the following command:

   ```
   Get-Mailbox | Where {$_.RoomMailboxAccountEnabled -eq $True} | Format-Table Name, UserPrincipalName
   ```

3. Find the name of the room mailbox associated with your Teams Rooms device and make note of its UPN

4. After you find the room mailbox's UPN, run the following command. Replace `<UserPrincipalName>` with the room mailbox's UPN:

   ```
   Set-CalendarProcessing <UserPrincipalName> -ProcessExternalMeetingMessages $True -DeleteComments $False
   -DeleteSubject $False
   ```

Learn more about Exchange Online PowerShell.

Step 2: Configure Office 365 Threat Protection and link rewrite

To enable the one-touch join experience, meeting join link information from the third-party meeting needs to be present and readable in the meeting invite. If your organization uses the Office 365 Advanced Threat Protection Safe Links feature, or if you use a third-party solution that scans all incoming and outgoing URLs for threats, it may change the meeting join URLs and make the meeting unrecognizable by the Teams Rooms device. To make sure this doesn't happen, you need to add the third-party meeting service's URLs to the ATP Safe Links "do not rewrite" list

or the third-party URL rewrite exception list.

To add third-party meeting service URLs to the ATP Safe Links "do not rewrite" list, follow the steps in Set up a custom do-not-rewrite URLs list using ATP Safe Links. If you use a third-party solution, refer to the instructions for that solution to add URLs to its URL rewrite exception list.

Here are some example entries that you may need to add to your ATP Safe Links "do not rewrite" list or third-party URL rewrite exception list:

- **Cisco WebEx** `*.webex.com*`
- **Zoom** `*zoom.us*`, `*zoom.com*`, `*zoomgov.com*`

For a complete list of URLs to add to your ATP Safe Links "do not rewrite" list or third-party URL rewrite exception list, contact the third-party meeting service provider you want to accept meeting invites from.

Caution

Only add URLs that you trust to your ATP Safe Links "do not rewrite" list or third-party URL rewrite exception list.

Step 3: Enable third-party meetings on device

The last step you need to do is allow each Teams Rooms device to join third-party meetings. Third-party meetings require a username and email address to join them. If the username and email address that you need to use is different than the device's room mailbox, you need to add them to your device. You can do this in the device settings or in the XML config file.

Use device settings

To configure the Teams Rooms device using its touchscreen, do the following:

1. On the Microsoft Teams Rooms device, select **More ...**
2. Select **Settings**, and then enter the device administrator username and password
3. Go to the **Meetings** tab and select **Cisco WebEx**, **Zoom**[1], or both
4. If you want to join meetings with the username and email address associated with the room mailbox, select **Join with room info**
5. If you want to join meetings with an alternate username and email address, select **Join with custom info** and enter username and email address you'd like to use
6. Select **Save and exit**. Your device will restart.

Use the SkypeSettings.xml configuration file

The following settings can be added to the `SkypeSettings.xml` file located in `C:\Users\Skype\AppData\Local\Packages\Microsoft.SkypeRoomSystem_8wekyb3d8bbwe\LocalState`. For more information about the `SkypeSettings.xml` file, see Manage a Microsoft Teams Rooms console settings remotely with an XML configuration file.

To enable Cisco WebEx meetings, set the `WebExMeetingsEnabled` XML element to **True**, as follows.

```
<WebExMeetingsEnabled>True</WebExMeetingsEnabled>
```

To enable Zoom[1] meetings, set the `ZoomMeetingsEnabled` XML element to **True**, as follows.

```
<ZoomMeetingsEnabled>True</ZoomMeetingsEnabled>
```

You can optionally specify a custom username and email address to join third-party meetings using the following XML elements. If the values you provide aren't valid, the Teams Rooms device will default to use room mailbox username and email address.

```
<UseCustomInfoForThirdPartyMeetings>true</UseCustomInfoForThirdPartyMeetings>

<CustomDisplayNameForThirdPartyMeetings>guestname</CustomDisplayNameForThirdPartyMeetings>

<CustomDisplayEmailForThirdPartyMeetings>guest@contoso.com</CustomDisplayEmailForThirdPartyMeetings>
```

NOTE

To join Cisco WebEx meeting from a Teams Rooms device, the Cisco meeting needs to be hosted using Cisco WebEx web application version WBS 40.7 or later.

[1] Zoom meetings join is currently only available to select Microsoft Teams Rooms customers through Technology Access Program (TAP).

Deploy Microsoft Teams Rooms by using Microsoft Endpoint Configuration Manager

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This article gives you all the necessary information to create your Microsoft Teams Rooms deployments by using Microsoft Endpoint Configuration Manager.

With the easy-to-use methods provided by Configuration Manager, you can deploy the operating system and other applications to multiple target devices.

Use the approach illustrated below to guide you through your Configuration Manager configuration, and customize the sample packages and scripts provided throughout this guidance as needed for your organization.



IMPORTANT

This solution has only been tested with Surface Pro–based deployments. Follow the manufacturer's guidelines for configurations that aren't based on Surface Pro.

Validate prerequisites

To deploy Microsoft Teams Rooms with Configuration Manager, ensure that you meet the following prerequisites and requirements.

Microsoft Endpoint Configuration Manager requirements

- Microsoft Endpoint Configuration Manager version must be at least 1706 or above. We recommend using 1710 or later. Check out Support for Windows 10 in Configuration Manager to learn about the Windows 10 versions that Configuration Manager supports.
- A supported version of Windows Assessment and Deployment Kit (ADK) for Windows 10 must be installed. See the versions of the Windows 10 ADK that you can use with different versions of Configuration Manager, and ensure that your deployment includes the correct version.
- The site system servers must have been assigned the distribution point role, and the boot images should be enabled for preboot execution environment (PXE) support to enable network-initiated deployments. If PXE support isn't enabled, you can use bootable media for your deployments.
- A network access account must be configured to support new computer (bare metal) deployment scenarios. To learn more about the configuration of a network access account, see Accounts used in Configuration Manager.
- We recommend that you enable multicast support, if you're likely to deploy the same Microsoft Teams Rooms image to multiple units at the same time.

Networking requirements

- Your network should have a Dynamic Host Configuration Protocol (DHCP) server, configured for automatic IP address distribution to the subnets where Microsoft Teams Rooms units will be deployed.

  > **NOTE**
  > DHCP lease duration must be set to a value longer than the image deployment duration. Otherwise, the deployment might fail.

- Your network, including switches and virtual LANs (VLANs), should be configured to support PXE. Refer to your network vendor for more information about IP Helper and PXE configuration. Alternatively, you can use bootable media for your deployments, if PXE support isn't enabled.

  > **NOTE**
  > For Surface Pro devices, booting from the network (PXE boot) is only supported when you use an Ethernet adapter or docking station from Microsoft. Third-party Ethernet adapters don't support PXE boot with Surface Pro. See Ethernet adapters and Surface deployment for more information.

Configure Microsoft Endpoint Configuration Manager for operating system deployment

This article assumes you already have a healthy Configuration Manager deployment, and doesn't detail all the steps required to deploy and configure Configuration Manager from scratch. The documentation and the configuration guidance on the Microsoft Endpoint Configuration Manager is a great resource; we recommend you start with these resources if you haven't yet deployed Configuration Manager.

Use the following instructions to verify that the operating system deployment (OSD) features are configured properly.

Validate and upgrade Configuration Manager

1. In the Configuration Manager console, go to **Administration** > **Updates and Servicing**.
2. Check the installed build and applicable updates that haven't been installed yet.
3. Review Support for Windows 10 in Configuration Manager; if you need to upgrade your deployment, select the update you want to install, and then select **Download**.
4. After the download is complete, select the update, and then select **Install Update Pack**.

Configure distribution points to support PXE and multicast

1. In the Configuration Manager console, go to **Administration** > **Distribution Points**.
2. Select the distribution point server that will serve the Microsoft Teams Rooms deployment, and then select **Properties**.
3. Select the **PXE** tab, and ensure that the following settings are enabled:
   - Enable PXE support for clients
   - Allow this distribution point to respond to incoming PXE requests
   - Enable unknown computer support
4. *Optional:* To enable multicast support, select the **Multicast** tab, and ensure that the following settings are enabled:
   - Enable multicast to simultaneously send data to multiple clients

- Configure the UDP port range as per your network team's recommendation

Configure the Network Access Account

1. In the Configuration Manager console, go to **Administration** > **Site Configuration** > **Sites**, and then select the site.
2. In the **Settings** group, select **Configure Site Components** > **Software Distribution**.
3. Select the **Network Access Account** tab. Set up one or more accounts, and then select **OK**.

> **NOTE**
> The accounts don't need any special rights, except for the **Access this computer from the network** right on the distribution point server. A generic domain user account will be appropriate. For more information, see Accounts used in Configuration Manager.

Configure a boot image

1. In the Configuration Manager console, go to **Software Library** > **Operating System** > **Boot Images**.
2. Select **Boot image (x64)**, and then select **Properties**.
3. Select the **Data Source** tab, and enable **Deploy this boot image from the PXE-enabled distribution point**.
4. Select the **Optional Components** tab to install required components:
   a. Select the star icon, and search for **HTML (WinPE-HTA)**
   b. Select **OK** to add HTML application support in to the boot image.
5. *Optional:* To customize the deployment experience, select the **Customization** tab.
   - Enable **command support (testing only)** if you want to have access to a command prompt during the deployment. When this is enabled, you can start a command prompt by selecting **F8** at any time during the deployment.
   - You can also specify a custom background image to be displayed during the deployment. To set an image, enable **Specify the custom background image file (UNC path** and select your background.
6. When asked, select **Yes** and distribute the updated boot image to your distribution points.

For more information, see Manage boot images with Configuration Manager.

> **NOTE**
> You can create a bootable USB media to initiate Configuration Manager task sequence–based deployments for environments that have no PXE support. The bootable media contains only the boot image, optional prestart commands and their required files, and Configuration Manager binaries to support booting into Windows PE and connecting to Configuration Manager for the rest of the deployment process. For more information, see Create bootable media.

Create Configuration Manager packages

> **IMPORTANT**
> The required operating system version for each SRS installer version changes with every MSI release. To determine the best operating system version for a given MSI, run the console setup script once. To learn more, see Deploy Microsoft Teams Rooms by using Microsoft Endpoint Configuration Manager.

Configuration Manager requires a number of packages to deploy and configure the Microsoft Teams Rooms units.

You need to create and configure the following packages, and then distribute them to the Configuration Manager site systems that have been assigned the distribution point server role.

PACKAGE NAME	TYPE	DESCRIPTION
SRS v2 - SRS Application Package	Software package	Package for the Microsoft Teams Rooms deployment kit
SRS v2 - Sysprep Package	Software package	Package for the custom Unattended.xml to configure Microsoft Teams Rooms units
SRS v2 - Set-SRSComputerName Package	Software package	Package for the HTML application (HTA) to assign a computer name during the deployment
SRS v2 - Configure SRS Setup	Software package	Package to configure deployment of the Microsoft Teams Rooms app
SRS v2 - OS Updates Package	Software package	Package to deploy mandatory operating system updates
SRS v2 - Root Certificate Package	Software package	Optional - Package to deploy the root certificate (not required for domain-joined units)
SRS v2 - Microsoft Monitoring Agent Package	Software package	Optional - Package to deploy and configure the Microsoft Operations Management Suite agent
SRS v2 - WinPE Background Package	Software package	Package for the custom background image to use with boot images
Windows 10 Enterprise	Operating system image	Package for the operating system installation file (install.wim)
Surface Pro	Driver package	Package for the device drivers and firmware for Microsoft Surface Pro
Surface Pro 4	Driver package	Package for the device drivers and firmware for Microsoft Surface Pro 4

For more information, see Packages and programs in Configuration Manager.

Create folders for the package source files

Configuration Manager requires package source files to be organized in a specific folder structure when they're first created and when they're updated.

Create the following folder structure on the Microsoft Endpoint Configuration Manager central administration site or primary site, or on a server share you're using to host package source files:

- SRS v2 - Microsoft Monitoring Agent Package
- SRS v2 - OS Updates Package
- SRS v2 - Root Certificate Package
- SRS v2 - Set-SRSComputerName Package

- SRS v2 - SRS Application Package
- SRS v2 - Configure SRS Setup
- SRS v2 - Sysprep Package
- Drivers
  - Surface Pro
  - Surface Pro 4
- Operating Systems
  - Windows 10 Enterprise

> **TIP**
> You may also download and use the zip file that includes the folder structure for the packages, the scripts that you need to use, and the task sequence template, that you need to import.

Create the Monitoring agent package

1. Download the Monitoring agent from https://go.microsoft.com/fwlink/?LinkId=828603.
2. Extract the package into the **SRS v2 - Microsoft Monitoring Agent Package** folder by opening a Command Prompt window and entering **MMASetup-AMD64.exe /C:** at the command prompt.
3. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.
4. Enter the following information to create the package:
   - Name: **SRS v2 - Microsoft Monitoring Agent Package**
   - Manufacturer: **Microsoft Corporation**
   - Version: **8.1.11081.0** (enter the version of the downloaded installation file)
   - Select the **This package contains source files** check box, enter the path to the **SRS v2 - Microsoft Monitoring Agent Package** folder, and then select **Next**.
5. Select **Do not create a program**, and then select **Next**.
6. Review the **Confirm the settings** page, and then select **Next**.
7. Select **Close**.

Create the operating system updates package

1. In the **SRS v2 - OS Updates Package** folder, create a new PowerShell script named **Install-SRSv2-OS-Updates.ps1**.
2. Copy the script below into the **Install-SRSv2-OS-Updates.ps1** script. Alternatively, you can download the Install-SRSv2-OS-Updates.ps1 script from here.

```
# Install-SRSv2-OS-Updates.ps1
$strPath = split-path -parent $MyInvocation.MyCommand.Definition
$total = gci $strPath *.msu | measure | Select-Object -expand Count
$i = 0
gci $strPath *.msu | ForEach-Object {
  $i++
  WUSA ""$_.FullName /quiet /norestart""
  Write-Progress -activity "Applying Mandatory Updates" -status "Installing
  $_ .. $i of $total" -percentComplete (($i / $total) * 100)
  Wait-Process -name wusa
}
```

3. Download the mandatory Windows Update packages into the same folder.

> **NOTE**
> At the time this article was published, only KB4056892 was required. Check Configure a Microsoft Teams Rooms console, to see whether any other updates are required.

4. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.
5. Enter the following information to create the package:
   - Name: **SRS v2 – OS Updates Package**
   - Manufacturer: **Microsoft Corporation**
   - Version: **1.0.0**
   - Select the **This package contains source files** check box, enter the path to the **SRS v2 - OS Updates Package** folder, and then select **Next**.
6. Select **Do not create a program**, and then select **Next**.
7. Review the **Confirm the settings** page, and then select **Next**.
8. Select **Close**.

Create the root certificate package (optional)

You create this package to distribute the root certificate for devices that won't be joined to an Active Directory domain. Create this package only if both the following conditions apply:

- Your deployment includes on-premises Lync or Skype for Business Server.
- Microsoft Teams Rooms units are configured to work in a workgroup instead of a domain member.

1. Copy the root certificate into the **SRS v2 – Root Certificate Package** folder.
2. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.
3. Enter the following information to create the package:
   - Name: **SRS v2 – Root Certificate Package**
   - Manufacturer: *Your organization's name*
   - Version: **1.0.0**
   - Select the **This package contains source files** check box, enter the path to the **SRS v2 – Root Certificate Package** folder, and then select **Next**.
4. Select **Do not create a program**, and then select **Next**.
5. Review the **Confirm the settings** page, and then select **Next**.

6. Select **Close**.

Create the Microsoft Teams Rooms deployment kit package

1. Download the latest version of the **Microsoft Teams Rooms deployment kit** from https://go.microsoft.com/fwlink/?linkid=851168, and install it to a workstation.
2. Copy the content from **C:\Program Files (x86)\Skype Room System Deployment Kit** to the **SRS v2 - SRS Application Package** folder.
3. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.
4. Enter the following information to create the package:
   - Name: **SRS v2 – SRS Application Package**
   - Manufacturer: **Microsoft Corporation**
   - Version: **3.1.104.0** (enter the version of the downloaded installation file)
   - Select the **This package contains source files** check box, enter the path to the **SRS v2 – SRS Application Package** folder, and then select **Next**.
5. Select **Do not create a program**, and then select **Next**.
6. Review the **Confirm the settings** page, and then select **Next**.
7. Select **Close**.

Create the computer name assignment package

1. In the **SRS v2 - Set-SRSComputerName Package** folder, create a new HTML application named **Set-SRSComputerName.hta** .
2. Copy the following script into the **Set-SRSComputerName.hta** file. Alternatively, you can download the Set-SRSComputerName.hta file from here.

```
<!DOCTYPE HTML>
<html>
<head>
<title>Set SRS Computer Name</title>
<HTA:APPLICATION
  APPLICATIONNAME="Set SRS Computer Name"
  ID="SetSRSComputerName"
  VERSION="1.0"
  SCROLL="no"
  SINGLEINSTANCE="yes"
  WINDOWSTATE="maximize"
  MaximizeButton="no"
  MinimizeButton="no"
  SysMenu="no"
  ShowInTaskbar="no"
  Caption="no"
  />
<style type="text/css">
body {
    background-color: #fdfeff;
    color: darkblue;
    font-family: Calibri;
    font-size: 12pt;
    margin: 4em 3em;
}
</style>
</head>
<script language="VBScript">
Public strNewComputerName
Sub GenerateComputerName()
```

```
    strComputer = "."
    Set objWMIService = GetObject("winmgmts:\\" & strComputer & "\root\cimv2")
    Set colItems = objWMIService.ExecQuery("Select * from Win32_BIOS",,48)
    For Each objItem in colItems
        strSerialNumber = objItem.SerialNumber
    Next
    strNewComputerName = "SRS-"  & right(replace(strSerialNumber, "-","") ,10)
    TextArea1.innerHTML = "The serial number of the device: " & strSerialNumber
    strHTMLText = strHTMLText & "<br> Computer name to be assigned: <font color = red>" &
strNewComputerName & "</font>"
    strHTMLText = strHTMLText & "<br><br> Click Accept to use this as the computer name and continue
deployment, or Change to set a new name."
    strHTMLText = strHTMLText & "<p><input type=""button"" value=""Accept"" name = ""Accept_Button""
onclick=""SetComputerName"" />"
    strHTMLText = strHTMLText & " <input type=""button"" value=""Change"" name = ""Change_Button""
onclick=""ChangeComputerName"" />"
    TextArea2.innerHTML = strHTMLText
End Sub

Sub SetComputerName()
    dim result
    result = MsgBox("Computer Name to be assigned: " & strNewComputerName &vbcrlf & "Are you sure you
want to continue?", 36)
    If (result = vbYes) then
        SET env = CreateObject("Microsoft.SMS.TSEnvironment")
        env("OSDComputerName") = strNewComputerName
        self.close
    elseif (result = vbNo) then
        Window_OnLoad
    End If
End Sub

Sub UpdateComputerName()
    strNewComputerName = newcomputername.value
    if len(trim(strNewComputerName)) = 0 then
        MsgBox "Computer name cannot be empty." &vbcrlf & "Update and try again.",16
        exit sub
    end if
    SetComputerName
End Sub

Sub ChangeComputerName()
    TextArea2.innerHTML = "<p>Type the new computer name and click Accept:  <input type=""text""
name=""newcomputername"" value =" & strNewComputerName & " />"
    TextArea2.innerHTML = TextArea2.innerHTML & "<br><input type=""button"" value=""Update"" name =
""Update_Button"" onclick=""UpdateComputerName"" />"
End Sub

Sub Window_OnLoad
    Set oTSProgressUI = CreateObject("Microsoft.SMS.TsProgressUI")
    oTSProgressUI.CloseProgressDialog
    GenerateComputerName
End Sub
</script>

<body>
<span id = "TextArea1"></span>
<span id = "TextArea2">
</span>
</body>
</html>
```

3. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.

4. Enter the following information to create the package:

- Name: **SRS v2 - Set-SRSComputerName Package**
- Manufacturer: **Microsoft Corporation**
- Version: **1.0.0**
- Select the **This package contains source files** check box, enter the path to the **SRS v2 - Set-SRSComputerName Package** folder, and then select **Next**.

5. Select **Do not create a program**, and then select **Next**.
6. Review the **Confirm the settings** page, and then select **Next**.
7. Select **Close**.

Create the Sysprep package

1. In the **SRS v2 – Sysprep Package** folder, create a new XML file named **Unattend.xml** .
2. Copy the following text into the **Unattend.xml** file. Alternatively, you can download the Unattend.xml file from here.

```
<?xml version="1.0" encoding="utf-8"?>
<unattend xmlns="urn:schemas-microsoft-com:unattend">
<settings pass="specialize">
    <component name="Microsoft-Windows-Embedded-BootExp" processorArchitecture="amd64"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="NonSxS"
xmlns:wcm="https://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <DisableBootMenu>1</DisableBootMenu>
        <DisplayDisabled>1</DisplayDisabled>
    </component>
    <component name="Microsoft-Windows-powercpl" processorArchitecture="amd64"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
xmlns:wcm="https://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <PreferredPlan>8c5e7fda-e8bf-4a96-9a85-a6e23a8c635c</PreferredPlan>
    </component>
</settings>
<settings pass="oobeSystem">
    <component name="Microsoft-Windows-Shell-Setup" processorArchitecture="amd64"
publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
xmlns:wcm="https://schemas.microsoft.com/WMIConfig/2002/State"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <OOBE>
            <HideEULAPage>true</HideEULAPage>
            <HideLocalAccountScreen>true</HideLocalAccountScreen>
            <HideOEMRegistrationScreen>true</HideOEMRegistrationScreen>
            <HideOnlineAccountScreens>true</HideOnlineAccountScreens>
            <HideWirelessSetupInOOBE>true</HideWirelessSetupInOOBE>
            <SkipMachineOOBE>true</SkipMachineOOBE>
            <SkipUserOOBE>true</SkipUserOOBE>
            <ProtectYourPC>1</ProtectYourPC>
        </OOBE>
        <AutoLogon>
            <Enabled>true</Enabled>
            <Username>Skype</Username>
            <Password>
                <Value>UABhAHMAcwB3AG8AcgBkAA==</Value>
                <PlainText>false</PlainText>
            </Password>
        </AutoLogon>
        <UserAccounts>
            <LocalAccounts>
                <LocalAccount wcm:action="add">
                    <Password>
                        <Value>cwBmAGIAUABhAHMAcwB3AG8AcgBkAA==</Value>
                        <PlainText>false</PlainText>
                    </Password>
                    <Name>Admin</Name>
                    <Group>Administrators</Group>
                    <DisplayName>Administrator</DisplayName>
                    <Description>Administrator</Description>
                </LocalAccount>
            </LocalAccounts>
        </UserAccounts>
    </component>
</settings>
<cpi:offlineImage cpi:source="wim:h:/install.wim#Windows 10 Enterprise" xmlns:cpi="urn:schemas-
microsoft-com:cpi" />
</unattend>
```

3. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.

4. Enter the following information to create the package:

   - Name: **SRS v2 - Sysprep Package**

- Manufacturer: **Microsoft Corporation**
- Version: **1.0.0**
- Select the **This package contains source files** check box, enter the path to the **SRS v2 – Sysprep Package** folder, and then select **Next**.

5. Select **Do not create a program**, and then select **Next**.
6. Review the **Confirm the settings** page, and then select **Next**.
7. Select **Close**.

Create the Windows 10 Enterprise package

1. Obtain a Windows 10 Enterprise x64 media, and copy the **install.wim** file to the **Operating Systems\Windows 10 Enterprise** folder.
2. In the Configuration Manager console, go to **Software Library** > **Operating Systems** > **Operating System Images**, and then select **Add Operating System Image**.
3. Specify the path to the **install.wim** file you just copied, and then select **Next**.
4. Update the **Version** field to match the build number of the Windows 10 Enterprise image, and then select **Next**.
5. Review the **Details** page, and then select **Next**.
6. Select **Close**.

For more information, see Manage OS images with Configuration Manager.

Create Surface Pro device driver packages

Microsoft Teams Rooms is supported for both Surface Pro and Surface Pro 4. You need to create a driver package for each Surface Pro model you have in your environment.

> **IMPORTANT**
> The drivers must be compatible with the Windows 10 Enterprise build and the Microsoft Teams Rooms deployment kit version. For more information, see Download the latest firmware and drivers for Surface devices and Configure a console.

1. Download the latest drivers and firmware.
   - For Surface Pro: https://www.microsoft.com/download/details.aspx?id=55484
   - For Surface Pro 4: https://www.microsoft.com/download/details.aspx?id=49498
2. Extract the downloaded driver and firmware. Open a Command Prompt window and at the command prompt, enter one of the following commands:
   - `msiexec /a C:\SurfacePro_Win10.msi /passive TARGETDIR="C:\_Sources\\Drivers\Surface Pro"`
   - `msiexec /a C:\SurfacePro4_Win10.msi /passive TARGETDIR="C:\_Sources\\Drivers\Surface Pro 4"`
3. In the Configuration Manager console, go to **Software Library** > **Operating Systems** > **Drivers**, and then select **Import Driver**.
4. Select **Import all drivers in the following network path (UNC)**, select the source folder (for example, C:_Sources\Drivers\Surface Pro), and then select **Next**.
5. On the **Specify the details for the imported drivers** page, select all the listed drivers, and then select **Enable these drivers and allow computers to install them**.
6. Select **Categories**, create a new category that matches the Surface model, select **OK**, and then select **Next**.

7. Select **New Package**.
8. Specify the package name that matches the Surface Pro model, enter a folder path to store the driver package files in, select **OK**, and then select **Next**.
9. On the **boot images** page, ensure that no boot images are selected, and then select **Next**.
10. Select **Close**.
11. Go to **Software Library** > **Operating Systems** > **Drivers**, select **Folder** > **Create Folder**, and enter a folder name that matches the Surface Pro model that you just imported the drivers for.
12. Move all the imported drivers to the newly created folder for easier navigation and operation.

> **NOTE**
> Repeat the same steps for other Surface Pro models you might have. For more information, see Manage drivers in Configuration Manager.

Create Microsoft Teams Rooms Configuration Package

1. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**, and then select **Create Package**.
2. Enter the following information to create the package:
   - Name: **SRS v2 - Configure SRS Setup Package**
   - Manufacturer: **Microsoft Corporation**
   - Version: **1.0.0**
   - Select the **This package contains source files** check box, enter the path to the **SRS v2 - Configure SRS Setup** folder, and then select **Next**.
3. Select **Do not create a program**, and then select **Next**.
4. Review the **Confirm the settings** page, and then select **Next**.
5. Select **Close**.

Distribute Configuration Manager packages

All the packages must be distributed to the servers that have been assigned the distribution point role in the Configuration Manager hierarchy. Follow the instructions below to initiate package distribution.

1. Distribute software packages.
   a. In the Configuration Manager console, go to **Software Library** > **Application Management** > **Packages**. Select all the software packages you want to distribute, and then select **Distribute Content**.
   b. Review the list of packages, and then select **Next**.
   c. Add all the distribution point servers (or distribution point groups, depending on your Configuration Manager hierarchy) to the list, and then select **Next**.
   d. Select **Next**, and then select **Close**.
2. Distribute driver packages.
   a. In the Configuration Manager console, go to **Software Library** > **Operating Systems** > **Driver**

Packages. Select all the driver packages you want to distribute, and then select **Distribute Content**.

b. Review the list of packages, and then select **Next**.

c. Add all the distribution point servers (or distribution point groups, depending on your Configuration Manager hierarchy) to the list, and then select **Next**.

d. Select **Next**, and then select **Close**.

3. Distribute operating system packages.

a. In the Configuration Manager console, go to **Software Library** > **Operating Systems** > **Operating System Images**. Select all the operating system images you want to distribute, and then select **Distribute Content**.

b. Review the list of packages, and then select **Next**.

c. Add all the distribution point servers (or distribution point groups, depending on your Configuration Manager hierarchy) to the list, and then select **Next**.

d. Select **Next**, and then select **Close**.

> **NOTE**
>
> Package distribution might take some time, depending on the package size, Configuration Manager hierarchy, number of distribution point servers, and the bandwidth available in your network.
>
> All the packages must be distributed before you can start deploying a Microsoft Teams Rooms unit.
>
> You can review the status of your package distribution in the Configuration Manager console by going to **Monitoring** > **Distribution Status** > **Content Status**.

Configuration Manager task sequences

You use task sequences with Configuration Manager to automate the steps for deploying an operating system image to a destination computer. To deploy a Microsoft Teams Rooms unit in an automated fashion, you create a task sequence that references the boot image used to start the destination Microsoft Teams Rooms computer, the Windows 10 Enterprise operating system image that you want to install, and any other additional content, such as other applications or software updates.

Import the sample task sequence

You can download and easily import a sample task sequence and customize it to meet your needs.

1. Download the sample task sequence, and copy the downloaded zip file to a shared location.
2. In the Configuration Manager console, go to **Software Library** > **Operating Systems** > **Task Sequences**, and then select **Import Task Sequence**.
3. Select **Browse**, go to the shared folder location you used in step 1, select the **Microsoft Teams Rooms Deployment (EN-US).zip** file, and then select **Next**.
4. Set **Action** to **Create New**, and then select **Next**.
5. Confirm the settings, and then select **Next**.
6. Select **Close**.

Validate that the reference packages are correctly linked to each task sequence step.

1. Select the imported task sequence, and then select **Edit**.

The Task Sequence Editor opens and displays each sequential step that you need to deploy and configure a Microsoft Teams Rooms unit.

2. Walk through each step and complete the recommended updates:

   a. **Restart in Windows PE**: This step restarts and then boots the computer into Windows PXE. No changes are required for this step.

   b. **Partition Disk 0 – UEFI**: This step wipes the disk configuration and creates partitions based on the configured settings. We recommend that you not make any changes to this step.

   c. **Set SRS Computer Name**: This step includes an HTML application to provide a UI to set a computer name for the Microsoft Teams Rooms unit during the deployment.

      - This is an optional step, but it can only be disabled if you want to manage computer naming through an alternate process.
      - Verify that the **SRS v2 - Set-SRSComputerName** package is selected. If it isn't, browse to the package and select it.

   d. **Apply Operating System**: This step specifies the operating system image to be deployed and the unattended Sysprep answer file to use.

      - Verify that the correct Windows 10 Enterprise operating system image file is selected.
      - Verify that **Use an unattended or Sysprep answer file for a custom installation** is enabled, and the **SRS v2 - Sysprep Package** is selected. Also ensure that **File Name** is set to **unattend.xml**.

   e. **Apply Windows Settings**: This step gathers information about the Windows installation.

      - Provide licensing and registration information including the product key, local administrator account password, and time zone (depending on your needs).

   f. **Apply Network Settings**: This step allows you to specify a workgroup or Active Directory domain name and organizational unit.

      > **NOTE**
      > See Skype Room System domain joining considerations for recommended actions you need to take in deploying Microsoft Teams Rooms units as members of an Actve Directory domain.

   g. **Apply Drivers:** This step and its sub-steps are used to deploy applicable device drivers and firmware based on the Surface Pro model you have. Update each step to specify the relevant driver package associated with this deployment.

      - Each driver package is configured to leverage Windows Management Instrumentation (WMI) filters to deploy relevant drivers and firmware based on the Surface Pro make and model.
      - We highly recommend that you not alter the configuration of these drivers, otherwise deployment might fail.

   h. **Set up Windows and Configuration Manager**: This step deploys and configures the Configuration Manager client. Update this step to specify the built-in Configuration Manager Client Package.

   i. **Install Root Certificate**: This step distributes the root certificate for non–domain-joined devices, and therefore is optional and disabled by default.

      - Enable this step if you need to deploy a root certificate to the Microsoft Teams Rooms units.
      - If you do need to perform this step, verify that the **SRS v2 – Root Certificate Package** and **Disable 64-bit file system redirection** are selected.

j. **Install and Configure Monitoring Agent**: This step installs the 64-bit version of the Microsoft Azure Monitor agent and configures the agent to connect to your Log Analytics workspace.

   - This step is disabled by default. Enable this step only if you're going to use the Monitoring Agent to monitor the health of your Microsoft Teams Rooms units.
   - Edit this step and update the command-line parameters to specify your **Workspace ID** and **Workspace Key**.
   - See Configure test devices for Azure Monitoring for more information about obtaining the Operations Management Suite Workspace ID and the primary key.
   - Verify that the **SRS v2 – Microsoft Monitoring Agent Package** and **Disable 64-bit file system redirection** are selected.
   - For more information about monitoring the health of your Microsoft Teams Rooms deployment, see Plan Microsoft Teams Rooms management with Azure Monitor, Deploy Microsoft Teams Rooms management with Azure Monitor and Manage Microsoft Teams Rooms devices with Azure Monitor.

k. **Copy SRS v2 Configuration Files**: This step copies the required setup and configuration files from the Microsoft Teams Rooms deployment kit to the local hard drive. No customization is required for this step.

   - Verify that the **SRS v2 – SRS Application Package** and **Disable 64-bit file system redirection** are selected.

l. **Install-SRSv2-OS-Updates**: This step deploys any mandatory operating system updates required with the Microsoft Teams Rooms deployment. Do the following:

   - Check Configure a Microsoft Teams Rooms console to see which updates are required.
   - Verify that your **SRS v2 – OS Updates Package** includes all the required updates.
   - Verify that the **SRS v2 – OS Updates Package** is selected.
   - Verify that the PowerShell execution policy is set to **Bypass**.

m. **Restart Computer**: This step reboots the computer after the mandatory operating system updates are installed. No customization is required for this step.

n. **Configure Windows Components**: This step configures the required Windows features. No customization is required for this step.

o. **Restart Computer**: This step reboots the computer after the Windows features are configured. No customization is required for this step.

p. **Add Local Skype User**: This step creates the local Skype account used to automatically sign in to Windows and start the Microsoft Teams Rooms application. This step doesn't have any software package associated with it, and no customization is required for it.

q. **Set up and configure SRS application**: This step configures the Microsoft Teams Rooms application installation for the next boot of the operating system.

   - Verify that the **SRS v2 – Configure SRS Setup Package** and **Disable 64-bit file system redirection** are selected.

> **IMPORTANT**
>
> It is very important that the task sequence steps must be in the provided order. Modifying the order of steps, or configuring additional steps might break the deployment.
>
> **Set up and configure SRS application** step must be the last step in the task sequence, otherwise the deployment might fail.

Create deployment for the task sequence

1. Select the task sequence, and then select **Deploy**.
2. Select **Browse** to select target collection for deployment.
3. Select **All Unknown Computers** and then select **OK**.
4. Select **Next**.
5. Select **Available** on the **Purpose** drop down list.
6. Select **Only Media and PXE** in the **Make available to the following** list, and then select **Next**.

   > **WARNING**
   >
   > It is very important that **Purpose** is set to **Available**. Make sure that the **Purpose** is **NOT** set to **Required**. Also make sure that you select **Only Media and PXE** in the **Make available to the following**.
   >
   > Setting these values to something else might cause all computers to get the Microsoft Teams Rooms deployment image when booted.

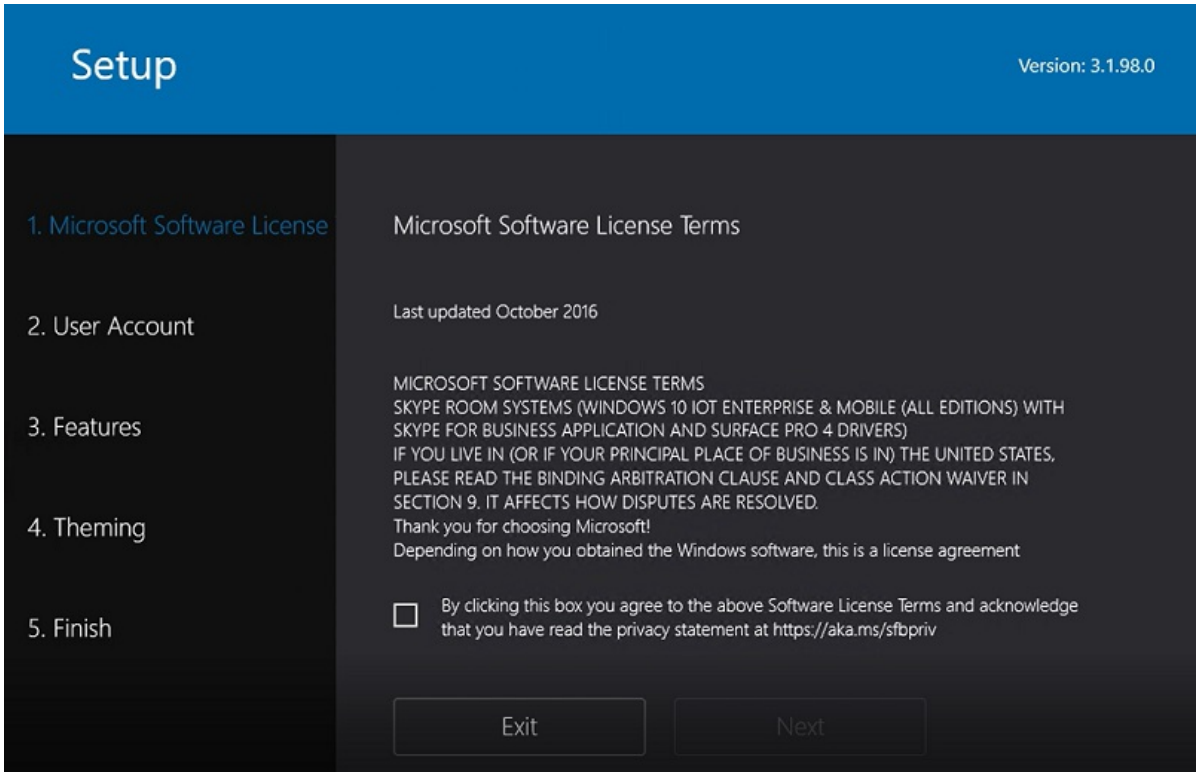
7. Do not specify any schedule and select **Next**.
8. Do not change anything within the **User Experience** section and select **Next**.
9. Do not change anything within the **Alerts** section and select **Next**.
10. Do not change anything within the **Distribution Points** section and select **Next**.
11. Confirm the settings and then select **Next**.
12. Select **Close**.

Validate and troubleshoot the solution

After you've completed the Microsoft Endpoint Configuration Manager task sequences, you'll need to perform a test run to validate that the task sequence can deploy and configure Microsoft Teams Rooms units.

1. Connect the test device to the wired network by using one of the supported Ethernet adapters or using the Surface dock. If PXE boot functionality hasn't been configured for your environment, you can use the boot image on the USB flash drive that you created earlier to boot from USB and connect to Configuration Manager.
2. Access the firmware and initiate PXE boot:
   a. Ensure the Surface device is powered off.
   b. Press and hold the **Volume Up** button.
   c. Press and release the **Power** button.
   d. After the device begins to boot, release the **Volume Up** button.
   e. Select **Boot configuration**.
   f. Do one of the following:
      - Select **PXE boot**, and drag it to the top of the list. Alternatively, you can swipe left on the network adapter to boot to the device immediately. This won't affect the boot order.
      - Select the USB flash drive that holds the boot media.
3. Select **Exit**, and then select **Restart Now**.

4. When prompted, select **Enter** for network boot service.
5. Windows PE will load into memory, and the Task Sequence Wizard will start. Select **Next** to continue.
6. Select the task sequence that you imported earlier, and then select **Next**.
7. After the disk configuration is applied, you'll be prompted to specify a computer name for the device. The user interface will display a recommended computer name based on the serial number of the Surface Pro device. You can either accept the proposed name or specify a new one. Follow the instructions on the computer name assignment screen. When you select **Accept**, the deployment begins.
8. The rest of the deployment process is automatic and doesn't ask for any more user input.
9. After the deployment task sequence finishes configuring the device, you'll see the following configuration screen that asks you to configure the Microsoft Teams Rooms application settings.



10. Plug the Surface Pro into the Microsoft Teams Rooms console, and configure the application settings.
11. Validate that the capabilities listed in Microsoft Teams Rooms help are working on the deployed device.

To troubleshoot a failed installation, check the **SMSTS.log** file, which logs all the steps executed in a Configuration Manager task sequence.

The SMSTS.log file is stored on one of a number of paths, depending on the stage of the build process. Check the following table to identify the path to the SMSTS.log file.

DEPLOYMENT PHASE	TASK SEQUENCE LOG PATH
WinPE, before HDD format	X:\Windows\Temp\smstslog\smsts.log
WinPE, after HDD format	C:_SMSTaskSequence\Logs\Smstslog\smsts.log
Operating system deployed, before the Configuration Manager agent was installed	c:_SMSTaskSequence\Logs\Smstslog\smsts.log

DEPLOYMENT PHASE	TASK SEQUENCE LOG PATH
Operating system and the Configuration Manager agent deployed	%windir%\System32\ccm\logs\Smstslog\smsts.log
Task sequence execution complete	%windir%\System32\ccm\logs\smsts.log

> **TIP**
> You can select **F8** at any time during the task sequence to open a command console, and then get access to the SMSTS.log file.

To troubleshoot PXE boot issues, check the two log files on the Configuration Manager server that are specific to PXE actions:

- **Pxecontrol.log**, located in the Configuration Manager installation logs directory
- **Smspxe.log**, located in Configuration Manager Management Point (MP) logs directory

For a complete list of the log files that you can use to further troubleshoot your Configuration Manager installation, see the Microsoft Endpoint Configuration Manager Log file reference.

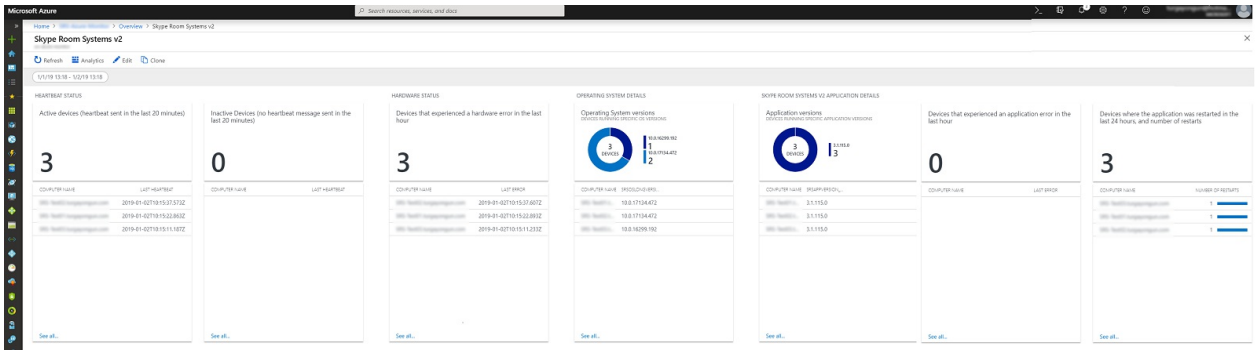
Deploy Microsoft Teams Rooms management with Azure Monitor

9/14/2020 • 20 minutes to read • Edit Online

This article discusses how to set up and deploy integrated, end-to-end management of Microsoft Teams Rooms devices by using Azure Monitor.

You can configure Log Analytics within Azure Monitor to provide basic telemetry and alerts that will help you manage Microsoft Teams Rooms meeting room devices. As your management solution matures, you might decide to deploy additional data and management capabilities to create a more detailed view of device availability and performance.

By following this guide, you can use a dashboard like the following example to get detailed status reporting for device availability, application and hardware health, and Microsoft Teams Rooms application and operating system version distribution.



At a high level, you need to perform the following tasks:

1. Validate Log Analytics configuration
2. Configure test devices for Log Analytics management setup
3. Map custom fields
4. Define the Microsoft Teams Rooms views in Log Analytics
5. Define alerts
6. Configure all devices for Monitoring
7. Configure additional Azure Monitor solutions

> **IMPORTANT**
> Although with minimal configuration, Azure Monitor Log Analytics can monitor a computer running a Windows operating system, there are still some Microsoft Teams Rooms–specific steps that you need to take before you start deploying agents to all Microsoft Teams Rooms devices. Therefore, we highly recommend you perform all configuration steps in the right order for a controlled setup and configuration. The quality of the end result very much depends on the quality of the initial configuration.

Validate Log Analytics configuration

You need to have a Log Analytics workspace to start collecting logs from Microsoft Teams Rooms devices. A workspace is a unique Log Analytics environment with its own data repository, data sources, and solutions. If you already have an existing Log Analytics workspace, you might use it to monitor your Microsoft Teams Rooms

deployment or alternatively, you can create a dedicated Log Analytics workspace specific to your Microsoft Teams Rooms monitoring needs.

If you need to create a new Log Analytics workspace, follow the instructions in the article Create a Log Analytics workspace in the Azure portal

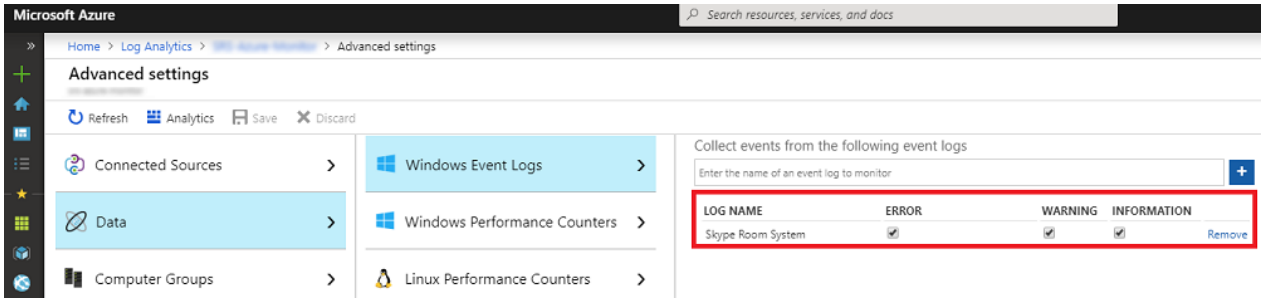
> **NOTE**
>
> To use Log Analytics with Azure Monitor, you need to have an active Azure subscription. If you don't have an Azure subscription, you can create a free trial subscription as a starting point.

Configure Log Analytics to collect Microsoft Teams Rooms event logs

Log Analytics only collects events from the Windows event logs that are specified in the settings. For each log, only the events with the selected severities are collected.

You need to configure Log Analytics to collect the logs required to monitor Microsoft Teams Rooms device and application status. Microsoft Teams Rooms devices use the **Skype Room System** event log.

To configure Log Analytics to collect the Microsoft Teams Rooms events, see Windows event log data sources in Azure Monitor



> **IMPORTANT**
>
> Configure Windows Event Log settings and enter **Skype Room System** as event log name, and then select the **Error**, **Warning**, and **Information** check boxes.

Configure test devices for Azure Monitoring

You need to prepare Log Analytics to be able to monitor Microsoft Teams Rooms–related events. To start with, you need to deploy Microsoft Monitoring agents to just one or two Microsoft Teams Rooms devices that you have physical access to, and get those test devices generate some data and push it to the Log Analytics workspace.

Install Microsoft Monitoring agents to test devices

Deploy the Microsoft Monitoring agent to the test devices by using the instructions provided in Connect Windows computers to the Log Analytics service in Azure. This article provides detailed information about the steps for deploying Microsoft Monitoring Agent for Windows, instructions for obtaining the Log Analytics ***Workspace ID*** and the ***primary key*** to get Microsoft Teams Rooms devices connected to your Azure Monitor deployment, and steps to verify agent connectivity to Log Analytics instance.

Generate sample Microsoft Teams Rooms events

After the Microsoft Monitoring agent is deployed onto the test devices, verify that the required event log data is collected by Azure Monitor.

> **NOTE**
> Reboot the device after the installation of the Microsoft Monitoring agent, and make sure that Microsoft Teams Rooms Meeting app is started, so that it can generate new events into the Event Log.

1. Sign in to the Microsoft Azure portal and go to Log Analytics and select your workspace.
2. List the heartbeat events generated by a Microsoft Teams Rooms device:
   a. Select your workspace and go to **Logs** and use a query to retrieve the heartbeat records that will have the custom fields for Microsoft Teams Rooms.
   b. Sample query: `Event | where Source == "SRS-App" and EventID == 2000`
3. Make sure that the query returns log records that include events generated by the Microsoft Teams Rooms meetings app.
4. Generate a hardware issue, and validate that the required events are logged in Azure Log Analytics.
   a. Unplug one of the peripheral devices on the test Microsoft Teams Rooms system. This could be the camera, speakerphone, microphone, or Front Room Display
   b. Wait 10 minutes for the event log to be populated in Azure Log Analytics.
   c. Use a query to list hardware error events: `Event | where Source == "SRS-App" and EventID == 3001`
5. Generate an application issue, and validate that the required events are logged.
   a. Modify Microsoft Teams Rooms application configuration, and type an incorrect Session Initiation Protocol (SIP) address/password pair.
   b. Wait 10 minutes for the event log to be populated in Azure Log Analytics.
   c. Use a query to list application error events:
   `Event | where Source == "SRS-App" and EventID == 2001 and EventLevel == 1`

> **IMPORTANT**
> These sample event logs are required before custom fields can be configured. Don't proceed to the next step until you have collected the required event logs.

Map custom fields

You use custom fields to extract specific data from the event logs. You need to define custom fields that will be used later with your tiles, dashboard views, and alerts. See Custom fields in Log Analytics and become familiar with the concepts before you start creating your custom fields.

To extract your custom fields out of the captured event logs, follow these steps:

1. Sign in to the Microsoft Azure portal and go to Log Analytics and select your workspace.
2. List the events generated by a Microsoft Teams Rooms device:
   a. Go to **Logs** and use a query to retrieve the records that will have the custom field.
   b. Sample query: `Event | where Source == "SRS-App" and EventID == 2000`
3. Select one of the records, select the button to the left, and start the field extraction wizard.
4. Highlight the data you'd like to extract from the RenderedDescription and provide a Field Title. The field names that you should use are provided in Table 1.
5. Use the mappings shown in *Table 1*. Log Analytics will automatically append the **_CF** string when you define the new field.

IMPORTANT

Remember that all JSON and Log Analytics fields are case-sensitive.

Pay attention to the queries required for each custom field in the table below. You need to use the correct queries for Log Analytics to successfully extract custom field values.

Table 1

JSON FIELD	LOG ANALYTICS CUSTOM FIELD	EVENT ID	QUERY TO USE WITH THE EXTRACTION
Description	SRSEventDescription	**2000**	Event | where Source == "SRS-App" and EventID == 2000
ResourceState	SRSResourceState	**2000**	Event | where Source == "SRS-App" and EventID == 2000
OperationName	SRSOperationName	**2000**	Event | where Source == "SRS-App" and EventID == 2000
OperationResult	SRSOperationResult	**2000**	Event | where Source == "SRS-App" and EventID == 2000
OS	SRSOSVersion	**2000**	Event | where Source == "SRS-App" and EventID == 2000
OSVersion	SRSOSLongVersion	**2000**	Event | where Source == "SRS-App" and EventID == 2000
Alias	SRSAlias	**2000**	Event | where Source == "SRS-App" and EventID == 2000
DisplayName	SRSDisplayName	**2000**	Event | where Source == "SRS-App" and EventID == 2000
AppVersion	SRSAppVersion	**2000**	Event | where Source == "SRS-App" and EventID == 2000
IPv4Address	SRSIPv4Address	**2000**	Event | where Source == "SRS-App" and EventID == 2000
IPv6Address	SRSIPv6Address	**2000**	Event | where Source == "SRS-App" and EventID == 2000

JSON FIELD	LOG ANALYTICS CUSTOM FIELD	EVENT ID	QUERY TO USE WITH THE EXTRACTION
Conference Microphone status	SRSConfMicrophoneStatus	3001	Event | where Source == "SRS-App" and EventID == 3001
Conference Speaker status	SRSConfSpeakerStatus	3001	Event | where Source == "SRS-App" and EventID == 3001
Default Speaker status	SRSDefaultSpeakerStatus	3001	Event | where Source == "SRS-App" and EventID == 3001
Camera status	SRSCameraStatus	3001	Event | where Source == "SRS-App" and EventID == 3001
Front of Room Display status	SRSFORDStatus	3001	Event | where Source == "SRS-App" and EventID == 3001
Motion Sensor status	SRSMotionSensorStatus	3001	Event | where Source == "SRS-App" and EventID == 3001
HDMI Ingest status	SRSHDMIIngestStatus	3001	Event | where Source == "SRS-App" and EventID == 3001

Define the Microsoft Teams Rooms views in Log Analytics

After data is collected and custom fields are mapped, you can use View Designer to develop a dashboard containing various tiles to monitor Microsoft Teams Rooms events. Use View Designer to create the following tiles. For more information, see Create custom views by using View Designer in Log Analytics

> **NOTE**
> Previous steps in this guide should have been completed for the dashboard tiles to work properly.

Create a Microsoft Teams Rooms dashboard by using the import method

You can import an Microsoft Teams Rooms dashboard and start monitoring your devices quickly. Take the following steps to import the dashboard:

1. Get the SkypeRoomSystems_v2.omsview dashboard file.
2. Sign in to the Microsoft Azure portal and go to Log Analytics and select your workspace.
3. Open **View Designer**.
4. Select **Import**, and then select the **SkypeRoomSystems_v2.omsview** file.
5. Select **Save**.

Create a Microsoft Teams Rooms dashboard manually

Alternatively, you can create your own dashboard and add only the tiles that you wish to monitor.

Configure the Overview Tile

1. Open **View Designer**.
2. Select **Overview Tile**, and then select **Two numbers** from the gallery.
3. Name the tile **Microsoft Teams Rooms**.
4. Define the **First Tile**:
   Legend: Devices that sent a heartbeat at least once within the last month
   Query:
   ```
   Event | where EventLog == "Skype Room System" and TimeGenerated > ago(30d) | summarize TotalSRSDevices = dcount(Computer)
   ```
5. Define the **Second Tile**:
   Legend: Active devices that sent a heartbeat within the last hour
   Query:
   ```
   Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" and TimeGenerated > ago(1h) | summarize TotalSRSDevices = dcount(Computer)
   ```
6. Select **Apply**.

Create a tile that displays active devices

1. Select **View Dashboard** to start adding your tiles.
2. Select **Number & list** from the gallery
3. Define the **General** properties:
   Group Title: Heartbeat Status
   New Group: Selected
4. Define the **Tile** properties:
   Legend: Active devices (heartbeat sent in the last 20 minutes)
   Tile Query:
   ```
   Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" and TimeGenerated > ago(20m) | summarize AggregatedValue = count() by Computer | count
   ```
5. Define the **List** properties:
   List Query:
   ```
   Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" and TimeGenerated > ago(20m) | summarize TimeGenerated = max(TimeGenerated) by Computer | order by TimeGenerated
   ```
6. Define **Column Titles**:
   Name: Computer Name
   Value: Last Heartbeat
7. Define **Navigation Query**.
   ```
   search {selected item} | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize arg_max(TimeGenerated, *) by Computer | project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF, SRSEventDescription_CF
   ```
8. Select **Apply**, and then **Close**.

Create a tile that displays devices that have connectivity issues

1. Select **Number & list** from the gallery, and then add a new tile.
2. Define the **General** properties:
   Group Title: Leave empty
   New Group: Not Selected
3. Define the **Tile** properties:
   Legend: Inactive Devices (no heartbeat message sent in the last 20 minutes)
   Tile Query:
   ```
   Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize LastHB = max(TimeGenerated) by Computer | where LastHB < ago(20m) | count
   ```
4. Define the **List** properties:
   List Query:
   ```
   Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize TimeGenerated = max(TimeGenerated) by Computer | where TimeGenerated < ago(20m) | order by TimeGenerated
   ```

5. Define **Column Titles**:

   Name: Computer Name

   Value: Last Heartbeat

6. Define **Navigation Query**:

```
search {selected item} | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize arg_max(TimeGenerated, *) by Computer | project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF, SRSEventDescription_CF
```

7. Select **Apply**, and then **Close**.

Create a tile that displays devices that have a hardware error

1. Select **Number & list** from the gallery, and then add a new tile.
2. Define the **General** properties:

   Group Title: Hardware Status

   New Group: Selected

3. Define the **Tile** properties:

   Legend: Devices that experienced a hardware error in the last hour

   Tile Query:

```
Event | where EventLog == "Skype Room System" and EventLevelName == "Error" and EventID == "3001" and TimeGenerated > ago(1h) | summarize AggregatedValue = count() by Computer | count
```

4. Define the **List** properties:

   List Query:

```
Event | where EventLog == "Skype Room System" and EventLevelName == "Error" and EventID == "3001" and TimeGenerated > ago(1h) | summarize TimeGenerated = max(TimeGenerated) by Computer | order by TimeGenerated
```

5. Define **Column Titles**:

   Name: Computer Name

   Value: Last Error

6. Define **Navigation Query**:

```
search {selected item} | where EventLog == "Skype Room System" and EventID == 3001 and EventLevelName == "Error" | summarize arg_max(TimeGenerated, *) by Computer | project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF, SRSConfMicrophoneStatus_CF, SRSConfSpeakerStatus_CF, SRSDefaultSpeakerStatus_CF, SRSCameraStatus_CF, SRSFORDStatus_CF, SRSMotionSensorStatus_CF, SRSHDMIIngestStatus_CF, SRSEventDescription_CF | sort by TimeGenerated desc
```

7. Select **Apply**, and then **Close**.

Create a tile that displays Microsoft Teams Rooms Operating System versions

1. Select **Donut & list** from the gallery, and then add a new tile.
2. Define the **General** properties:

   Group Title: Operating System details

   New Group: Selected

3. Define the **Header** properties:

   Title: Operating System versions

   Subtitle: Devices running specific OS versions

4. Define the **Donut** properties:

   Query:

```
Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize OS_Version = max(SRSOSLongVersion_CF) by Computer | summarize AggregatedValue = count() by OS_Version | sort by OS_Version asc
```

   Center Text: Devices

   Operation: Sum

5. Define the **List** properties.

   List Query:

```
Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize SRSOSLongVersion_CF = max(SRSOSLongVersion_CF) by Computer | sort by Computer asc
```

   Hide Graph: Selected

Enable Sparklines: Not selected

6. Define **Column Titles**.
   Name: Computer Name
   Value: Leave Empty
7. Define **Navigation Query**.

```
search {selected item} | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize arg_max(TimeGenerated, *) by Computer | project TimeGenerated, Computer, SRSDisplayName_CF, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF, SRSEventDescription_CF
```

8. Select **Apply** and then **Close**.

Create a tile that displays Microsoft Teams Rooms application versions

1. Select **Donut & list** from the gallery, and then add a new tile.
2. Define the **General** properties:
   Group Title: Microsoft Teams Rooms application details
   New Group: Selected
3. Define the **Header** properties:
   Title: Application versions
   Subtitle: Devices running specific application versions
4. Define the **Donut** properties:
   Query:

```
Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize App_Version = max(SRSAppVersion_CF) by Computer | summarize AggregatedValue = count() by App_Version | sort by App_Version asc
```

   Center Text: Devices
   Operation: Sum
5. Define the **List** properties.
   List Query:

```
Event | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize SRSAppVersion_CF = max(SRSAppVersion_CF) by Computer | sort by Computer asc
```

   Hide Graph: Selected
   Enable Sparklines: Not selected
6. Define **Column Titles**.
   Name: Computer Name
   Value: Leave Empty
7. Define **Navigation Query**.

```
search {selected item} | where EventLog == "Skype Room System" and SRSOperationName_CF == "Heartbeat" | summarize arg_max(TimeGenerated, *) by Computer | project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF, SRSEventDescription_CF
```

8. Select **Apply** and then **Close**.

Create a tile that displays devices that have an application error

1. Select **Number & list** from the gallery, and then add a new tile.
2. Define the **General** properties.
   Group Title: Leave empty
   New Group: Not Selected
3. Define the **Tile** properties.
   Legend: Devices that experienced an application error in the last hour
   Tile Query:

```
Event | where EventLog == "Skype Room System" and EventLevelName == "Error" and EventID == "2001" and TimeGenerated > ago(1h) | summarize AggregatedValue = count() by Computer | count
```

4. Define the **List** properties.
   List Query:

```
Event | where EventLog == "Skype Room System" and EventLevelName == "Error" and EventID == "2001" and
TimeGenerated > ago(1h) | summarize TimeGenerated = max(TimeGenerated) by Computer | order by TimeGenerated
```

5. Define **Column Titles**.
   Name: Computer Name
   Value: Last Error
6. Define **Navigation Query**.

```
search {selected item} | where EventLog == "Skype Room System" and EventID == 2001 and EventLevelName ==
"Error" | summarize arg_max(TimeGenerated, *) by Computer | project TimeGenerated, Computer, SRSAlias_CF,
SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF,
SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF, SRSEventDescription_CF | sort by
TimeGenerated desc
```

7. Select **Apply** and then **Close**.

Create a tile that displays devices that have been restarted

1. Select **Number & list** from the gallery, and then add a new tile.
2. Define the **General** properties.
   Group Title: Leave empty
   New Group: Not Selected
3. Define the **Tile** properties.
   Legend: Devices where the application was restarted in the last 24 hours, and number of restarts
   Tile Query:

```
Event | where EventLog == "Skype Room System" and EventID == "4000" and TimeGenerated > ago(24h) |
summarize AggregatedValue = count() by Computer | count
```

4. Define the **List** properties.
   List Query:

```
Event | where EventLog == "Skype Room System" and EventID == "4000" and TimeGenerated > ago(24h) | order by
TimeGenerated | summarize AggregatedValue = count(EventID) by Computer
```

5. Define **Column Titles**.
   Name: Computer Name
   Value: Number of Restarts
6. Define **Navigation Query**.

```
search {selected item} | where EventLog == "Skype Room System" and EventID == "4000" and TimeGenerated >
ago(24h) | project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF,
SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF,
SRSResourceState_CF, SRSEventDescription_CF
```

7. Select **Apply** and then **Close**.
8. Select **Save** to save your dashboard.

Now you've completed creating your views.

Configure Alerts in Azure Monitor

Azure Monitor can raise alerts to notify the administrators, when a Microsoft Teams Rooms console encounters an issue.

Azure Monitor includes a built-in alerting mechanism that runs through scheduled log searches at regular intervals. If the results of the log search match some particular criteria, an alert record is created.

The rule can then automatically run one or more actions to proactively notify you of the alert or invoke another process. The possible options with alerts are:

- Sending an email
- Invoking an external process through an HTTP POST request
- Starting a runbook in Azure Automation service

See Log alerts in Azure Monitor to learn more about the alerts in Azure Monitor.

> **NOTE**
> The following examples send email alerts when a Microsoft Teams Rooms device generates a hardware or an application error.

Configure an email alert for Microsoft Teams Rooms hardware issues

Configure an alert rule that checks for Microsoft Teams Rooms devices that have encountered hardware issues within the last hour.

1. Sign in to the Microsoft Azure portal and go to Log Analytics and select your workspace.
2. Navigate to your Log Analytics workspace and select **Alerts** and then select **New alert rule**
3. Select **Add condition** and then **Custom log search**
4. Enter the following query to the Search query text box.

```
Event
| where EventLog == "Skype Room System" and EventLevelName == "Error" and EventID == "3001" and
TimeGenerated > ago(1h)
| summarize arg_max(TimeGenerated, *) by Computer
| project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF,
SRSOSLongVersion_CF, SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF,
SRSResourceState_CF, SRSConfMicrophoneStatus_CF, SRSConfSpeakerStatus_CF, SRSDefaultSpeakerStatus_CF,
SRSCameraStatus_CF, SRSFORDStatus_CF, SRSMotionSensorStatus_CF, SRSHDMIIngestStatus_CF,
SRSEventDescription_CF
|sort by TimeGenerated desc
```

5. Configure the Alert logic settings:
   Based on: Number of results
   Condition: Greater then
   Threshold: 0
6. Configure Evaluation settings and select **Done**:
   Period (in minutes): 60
   Frequency (in minutes): 60
7. Configure action groups:
   a. Select **Create New**
   b. Provide suitable names for the *Action group name* and *Short Name* fields.
   c. Specify a unique *Action Name* and select **Email/SMS/Push/Voice**, and then select **Edit details**.
   d. Select the **Email** checkbox and provide the email address of the person or group that will receive the alerts.
   e. You may also provide your phone number to get notified with SMS, a voice call or both.
   f. Select **OK**.
8. **Customize Actions** if you like to override the subject line of the alert emails.
9. Specify a rule name and description.
   Rule Name: Microsoft Teams Rooms Hardware Failure Alert
   Description: List of devices that encountered a hardware issue within the last hour
10. Select the intended severity and make sure the rule is enabled.
11. Select **Create alert rule**.

Configure an email alert for Microsoft Teams Rooms application issues

Repeat the same procedure but use the following query to list devices that have encountered application issues within the last hour.

```
Event
| where EventLog == "Skype Room System" and EventLevelName == "Error" and EventID == "2001" and TimeGenerated
> ago(1h)
| summarize arg_max(TimeGenerated, *) by Computer
| project TimeGenerated, Computer, SRSAlias_CF, SRSAppVersion_CF, SRSOSVersion_CF, SRSOSLongVersion_CF,
SRSIPv4Address_CF, SRSIPv6Address_CF, SRSOperationName_CF, SRSOperationResult_CF, SRSResourceState_CF,
SRSEventDescription_CF
| sort by TimeGenerated desc
```

Now you've completed defining alerts. You can define additional alerts by using the examples above.

When an alert is generated, you'll get an email that lists the devices that encountered an issue within the last hour.

![Sample Azure Monitor alert email](../media/Deploy-Azure-Monitor-6.png "Sample Azure Monitor alert email")

Configure all devices for Azure Monitoring

After the dashboards and alerts are configured, you can set up and configure Microsoft Monitoring agent on all Microsoft Teams Rooms devices to complete your monitoring deployment.

Although you can install and configure the Microsoft Monitoring agent manually on each device, we highly recommend you leverage existing software deployment tools and methods.

If you're building your Microsoft Teams Rooms devices for the first time, you might want to include the Microsoft Monitoring agent setup and configuration steps as part of your build process. For more information, see Install the agent using the command line.

Deploying Microsoft Monitoring agent by using a Group Policy Object (GPO)

If you already deployed your Microsoft Teams Rooms devices before you implement Azure Monitoring, you can use the provided script to set up and configure the agents by using Active Directory group policy objects.

1. Create a shared network path and grant read access to **Domain Computers** group.
2. Download the 64-bit version of the Microsoft Monitoring Agent for Windows from https://go.microsoft.com/fwlink/?LinkID=517476
3. Extract the contents of the setup package into the network share.
   a. Open a Command Prompt window, and then execute **MMASetup-AMD64.exe /c**
   b. Specify the share you just created, and extract the content.
4. Create a new Group Policy Object and assign it to the organizational unit where Microsoft Teams Rooms machine accounts are located.
5. Configure PowerShell execution policy:
   a. Edit the newly created Group Policy Object and navigate to Computer Configuration \ Policies \ Administrative Templates \ Windows Components \ Windows PowerShell
   b. Enable the **Turn on Script Execution** and set **Execution Policy** to **Allow Local Scripts**.
6. Configure the startup script:
   a. Copy the following script and save it as Install-MMAgent.ps1.
   b. Modify WorkspaceId, WorkspaceKey, and SetupPath parameters to match your configuration.
   c. Edit the same Group Policy Object and navigate to Computer Configuration \ Policies \ Windows

Settings \ Scripts (Startup/Shutdown)

d. Double-click to select **Startup**, and then select **PowerShell Scripts**.

e. Select **Show Files**, and then copy the **Install-MMAgent.ps1** file to that folder.

f. Select **Add**, and then **Browse**.

g. Select the ps1 script you just copied.

7. Microsoft Teams Rooms devices should install and configure the Microsoft Monitoring agent with the second reboot.

```
# Install-MMAgent.ps1
<#
Date:        04/20/2018
Script:      Install-MMAgent.ps1
Version:     1.0
#>

# Set the parameters
$WorkspaceId = "<your workspace id>"
$WorkspaceKey = "<your workspace key>"
$SetupPath = "\\Server\Share"

$SetupParameters = "/qn NOAPM=1 ADD_OPINSIGHTS_WORKSPACE=1 OPINSIGHTS_WORKSPACE_AZURE_CLOUD_TYPE=0
OPINSIGHTS_WORKSPACE_ID=$WorkspaceId OPINSIGHTS_WORKSPACE_KEY=$WorkspaceKey AcceptEndUserLicenseAgreement=1"

# $SetupParameters = $SetupParameters + " OPINSIGHTS_PROXY_URL=<Proxy server URL> OPINSIGHTS_PROXY_USERNAME=
<Proxy server username> OPINSIGHTS_PROXY_PASSWORD=<Proxy server password>"

# Start PowerShell logging
Start-Transcript -Path C:\Temp\MMA-Install.Log

# Check if the Microsoft Monitoring Agent is installed
$mma = New-Object -ComObject 'AgentConfigManager.MgmtSvcCfg'

# Check if the Microsoft Monitoring agent is installed
if (!$mma)
{
    #Install agent
    Start-Process -FilePath "$SetupPath\Setup.exe" -ArgumentList $SetupParameters -ErrorAction Stop -Wait
}

# Check if the agent has a valid configuration
$CheckMMA = $mma.GetCloudWorkspace($WorkspaceId).AgentId
if (!$CheckMMA)
{
    # Apply new configuration
    $mma.AddCloudWorkspace($WorkspaceId, $WorkspaceKey)
    $mma.ReloadConfiguration()
}

Stop-Transcript
```

NOTE

You can refer to the article Managing and maintaining the Log Analytics agent when you need to reconfigure an agent, move it to a different workspace, or modify proxy settings after the initial installation.

Additional Solutions

Azure Monitor provides built-in management solutions through its solution gallery to further help you monitor your environment. We highly recommend that you add Alert Management and Azure Log Analytics Agent Health solutions to your workspace as well.

NOTE

The Agent Health solution can help you identify outdated or broken Microsoft Monitoring agents within your environment, and the Alert Management solution provides details about the alerts that have been raised within a given period.

See also

Plan Microsoft Teams Rooms management with Azure Monitor

Manage Microsoft Teams Rooms devices with Azure Monitor

Migrate Lync Room System (LRS) devices to Microsoft Teams Rooms

4/3/2020 • 2 minutes to read • Edit Online

Lync Room System (LRS) devices with Skype Room System Version 1 (SRS v1) software has reached end of support on October 9, 2018. This means Skype Room Systems v1 software will no longer get any product updates or fixes anymore. Customers with Lync Room System devices using Skype Room System v1 software are advised to upgrade their devices to Microsoft Teams Rooms.

Microsoft Teams Rooms software works with Microsoft Teams in addition to Skype for Business Server and Online services for meetings and calling on all Microsoft Teams Rooms supported devices.

Your existing devices **may** continue to work after the end of Skype Room System v1 software support. However, if this software hits a software bug that needs Microsoft to release a fix, it will not be supported. SRS v1 uses TLS 1.0/1.1 which will be deprecated by Microsoft in the future. You can learn more about preparing for TLS 1.0/1.1 deprecation.

Which devices are affected?

Here is the list of the devices that are affected by this change:

- Crestron RL
- Crestron RL2
- SMART Room systems
- Polycom CX8000

Upgrade options

There are multiple options for upgrading Lync Room Systems to the next generation of Microsoft Teams Rooms.

Crestron hardware Trade-in program

Crestron will provide an upgrade to the Crestron SR system or equivalent for all Non-Crestron Lync Room System customers (e.g Smart or Polycom LRS). See details of this program here or email Crestron LRS support.

Crestron RL2 upgrade to Microsoft Teams Rooms

Existing Crestron RL2 (also referred to as Crestron RL200) customers can acquire an upgrade kit to upgrade current RL2 to RL3 using a for a minimal cost per device. See details of this program here.

SMART Room Systems upgrade

For SMART LRS customers, apart from Crestron hardware trade-in program, SMART is also working on providing a solution to upgrade to Microsoft Teams Rooms. This upgrade will be provided by SMART Technologies Inc. to customer under product support. Please see more about this here.

What should you do?

We recommend you plan to update Lync Room System devices to Microsoft Teams Rooms before TLS 1.0/1.1 deprecation using upgrade options mentioned above. Additionally, you may also consider replacing existing devices with new devices certified for Microsoft Teams Rooms. See Room devices for details and also take a look at Microsoft Teams Rooms requirements.

NOTE

Microsoft Teams Rooms software supports the TLS 1.2 protocol as of December 14, 2018 with app version 4.0.64.0. For on-premises customers, enabling communication over TLS 1.2 for Microsoft Teams Rooms requires Skype for Business Server 2015 Cumulative Update 9 (CU9) or Skype for Business Server 2019 Cumulative Update 1 (CU1). The change should not affect Skype for Business Online customers as client changes are forward and backward compliant.

Content cameras

11/2/2020 • 4 minutes to read • Edit Online

You can now use a content camera with a Microsoft Teams Room system. A content camera interacts with special image-processing software and a whiteboard to allow a presenter to draw on an analog whiteboard and share the content with remote participants.

See the following video for examples of content camera functionality.

Set up a content camera

> **NOTE**
> Always adhere to your country or area's building code, which may define a minimum distance from the floor or a requirement that ceiling-mounted equipment be secured to a rafter or other structure. Follow the mounting instruction for the hardware provided with the camera you've selected. OEM camera mounting kits include a camera, USB 2.0 extenders and required cabling.

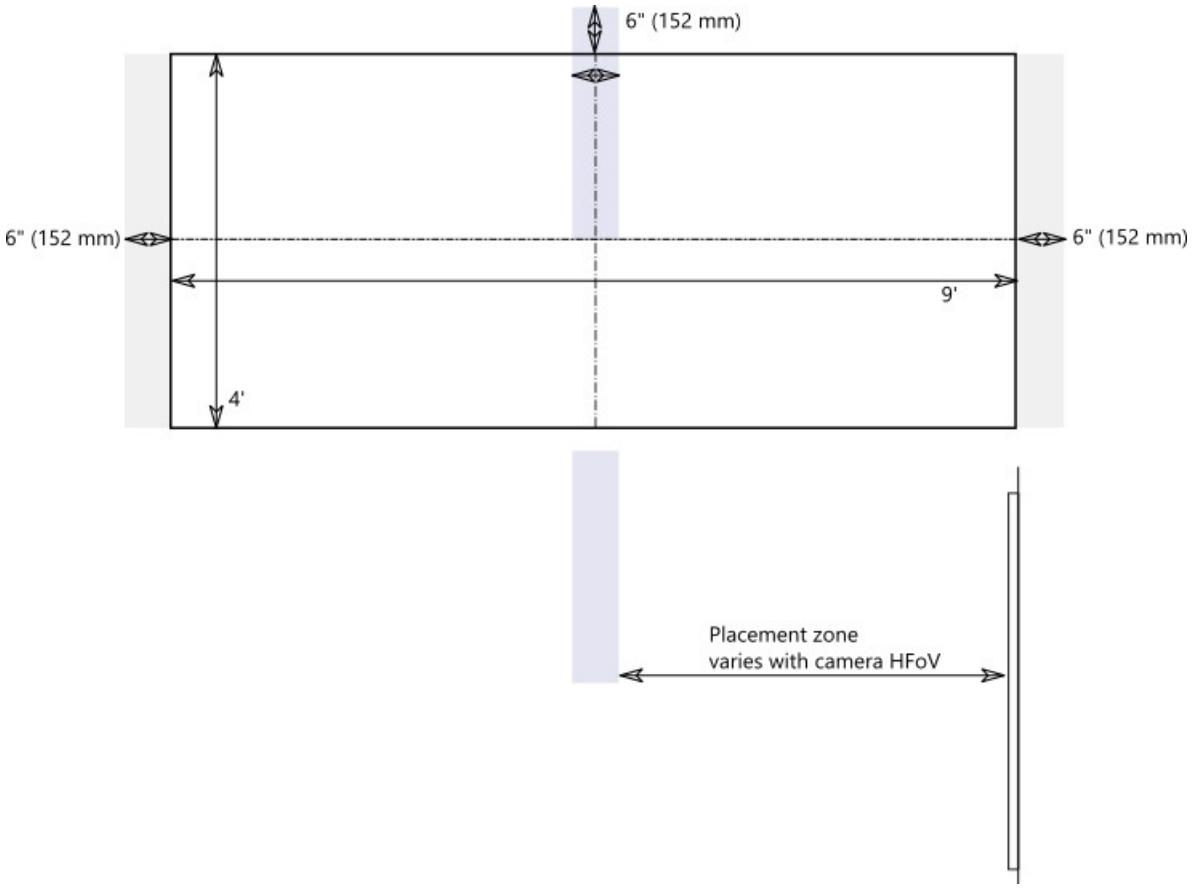
The size of the whiteboard used for sharing affects the placement of the camera. Board size recommendations are:

- 3–6 ft. (0.9–1.8 m) wide — Supported
- 6–9 ft. (1.8–2.7 m) wide — Recommended
- 9–12 ft. (2.7–3.6 m) wide — Supported
- Above 12 ft. (3.6 m) wide — camera covers 9–12 ft. (2.7–3.6 m) and crops the rest.

Camera location

Ideal placement of a content camera is centered vertically and horizontally on the whiteboard. Local building codes may have height restrictions that require the camera be elevated higher than the top of the white board.

You can install the camera up to 6 in. (152 mm) higher than the top of the whiteboard, and centered on the white board as shown. Make sure that the camera image includes at least a 6 in. (152 mm) border on both sides horizontally. You can use the camera preview in the Microsoft Teams Rooms app to determine final placement of the camera.



Camera distances

Using typical whiteboard markers, the optimal remote user experience is to share ink strokes in the 1–2 mm per pixel range in the content camera image, and the best results use 1.5 mm per pixel. All supported cameras provide 1920 x 1080 resolution, and some can exceed that resolution.

The distance of the camera from the whiteboard combines with the camera resolution and HFoV to determine the distance from the whiteboard. The following table shows examples of distances for various whiteboard sizes. You can use these values as starting points to determine final placement of the content camera.

Camera distance from whiteboard

CAMERA HFOV	3 FT. (0.91 M)	6 FT. (1.8 M)	9 FT. (2.74 M)	12 FT. (3.65 M)	MAX DISTANCE FROM WHITEBOARD	
80°	1.79 ft. (0.54 m)	3.58 ft. (1.09 m)	5.36 ft. (1.6 m)	7.15 ft. (2.17 m)	7.51 ft. (2.28 m)	
90°	1.5 ft. (0.45 m)	3.00 ft. (0.91 m)	4.5 ft. (1.37 m)	6.0 ft. (1.82 m)	6.3 ft. (1.92 m)	
100°	1.26 ft. (0.38 m)	2.52 ft. (0.77 m)	3.78 ft. (1.15 m)	5.03 ft. (1.53 m)	5.29 ft. (1.61 m)	
110°	1.05 ft. (0.32 m)	2.10 ft. (0.64 m)	3.15 ft. (0.96 m)	4.2 ft. (1.28 m)	4.41 ft. (1.31 m)	
120°	0.87 ft. (0.26 m)	1.73 ft. (0.52 m)	2.60 ft. (0.79 m)	3.46 ft. (1.05 m)	3.64 ft. (1.10 m)	

The distance between the content camera and the wall the whiteboard is mounted on depends on the HFoV for that model of camera, which varies. Install cameras with a larger HFoV (120 degrees for example) closer to the wall, and cameras with a narrower HFoV farther away from the wall. Check the HFoV before you start to install the chosen camera.

If you have whiteboards larger than 12 ft. (3.65 m) or with no corners (like full wall whiteboards), you can place the camera anywhere in the middle. The enhancement software selects an area in the middle if it fails to find whiteboard corners.

> **NOTE**
>
> You can use dark-colored tape or other items to create a defined content camera area on a full-wall white board.
>
> You can choose to have the camera mounted on a moveable tripod instead of a permanent mount. Place the tripod centered on the whiteboard. This setup may be temporary or used where there is little chance of knocking over the equipment. If you use a temporary mount, remember that content enhancement will be impacted if you move the camera after the initial share and you will need to re-share to correct for movement.
>
> A writing board that isn't white is not supported.

Supported cameras

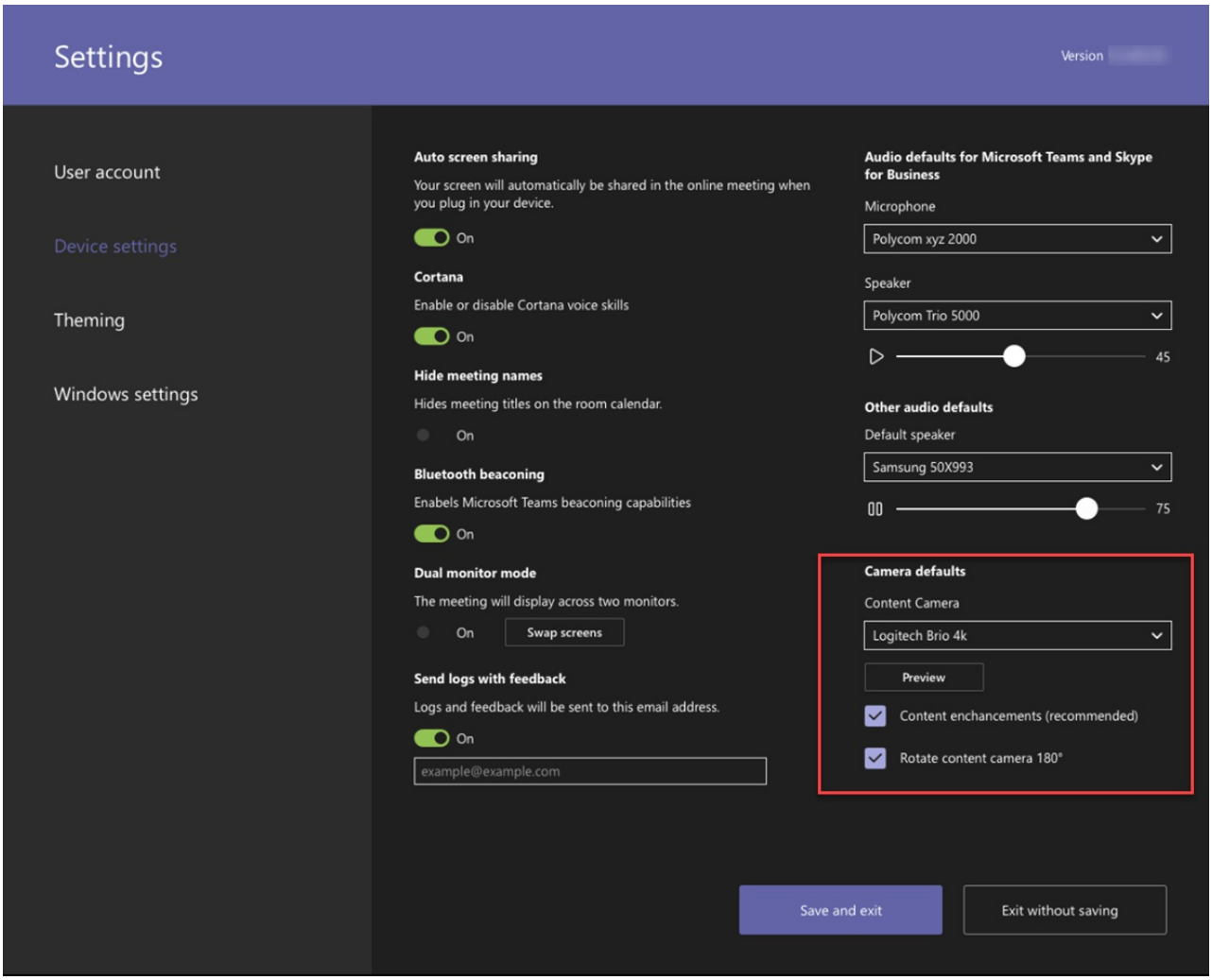
To determine whether you can use a camera as a content camera, refer to Certified firmware versions for USB audio and video peripherals.

Or, refer to the Microsoft Teams devices marketplace for supported Content Camera Kits at aka.ms/teamsdevices.

Camera settings

Once the camera is installed in the room, set it up on that room's Microsoft Teams Rooms console:

1. Select **Settings** ⚙, log in as Admin, and select **Device Settings**.
2. In the **Camera Defaults** section, select the content camera and make sure that the **Content enhancements** option is selected.
3. (Optional) If the camera was installed upside down because the camera was mounted from the ceiling, check the **Rotate content camera 180°** option.
4. Select **Save and exit**.



You can also adjust these settings remotely using an XML configuration file.

See also

Manage a Microsoft Teams Rooms console settings remotely with an XML configuration file

Microsoft Teams Rooms requirements

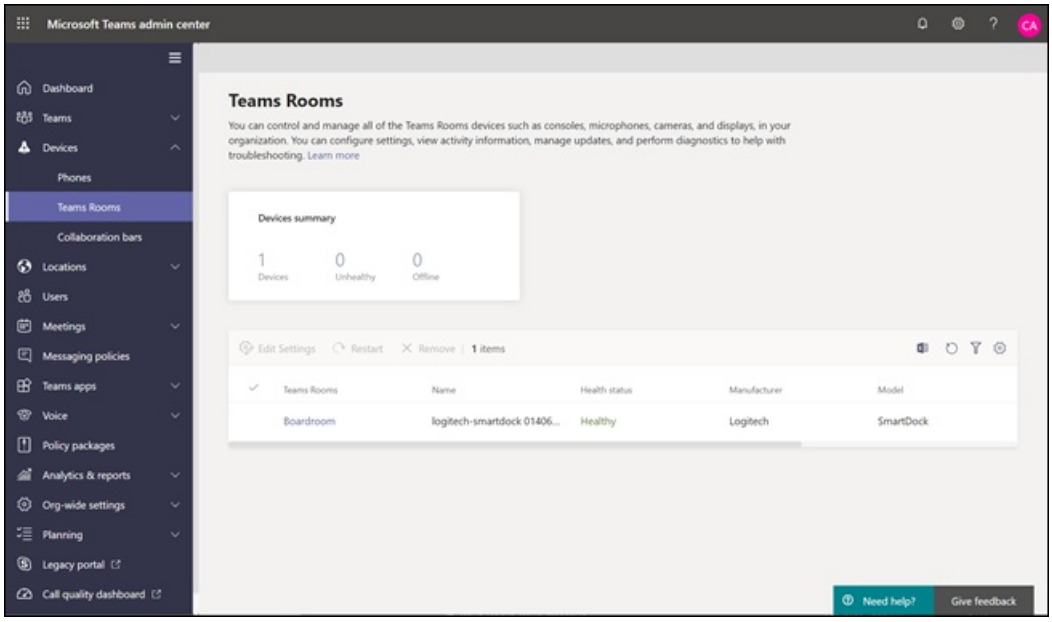
Manage Microsoft Teams Rooms

7/21/2020 • 7 minutes to read • Edit Online

If you have Microsoft Teams Rooms-certified devices in your organization, you can manage them from a central location using the Microsoft Teams admin center. You can:

- Perform device management like restarting or blocking devices, and downloading device logs
- Apply Teams-specific settings
- Check the health status of Microsoft Teams Room devices and their peripherals, including cameras, displays, microphones, and so on
- Review current and past meeting activity (such as details about call quality, network health and connectivity, and number of participants)
- See peripherals (such as cameras and projectors) connected to a Microsoft Teams Room device

To manage Teams Rooms devices, open the Microsoft Teams admin center and go to **Devices** > **Teams Rooms**.



> **IMPORTANT**
>
> To manage devices using the Teams admin center, you need to be assigned the Teams Service Administrator or Global Administrator roles.

Make changes to Teams Rooms devices

If you have more than one Teams Rooms device, you can do most actions on multiple devices at the same time. For example, you can set Teams app settings on all of your devices at the same time.

Device settings

You can change settings on one or more devices in your organization. To change settings, select the device or devices you want to manage and then select **Edit Settings**. A new pane will open with all of the settings you can change on your devices. The following table lists the settings you can change using the Teams admin center. Some settings are only available when you select a single device.

If you select more than one device, settings that support bulk editing show the two following options.

- **Keep existing value** If you choose this option, no changes will be made to the setting on the devices you selected.
- **Replace existing value with** If you choose this option, you can update the setting on the devices you selected with the value you provide.

  Caution

  Existing values on the settings you choose to update will be replaced with the value you provide. If you want to add to a list of existing values, you need to include the existing values with the value you want to add. For example, if a setting has an existing domain list of `contoso.com, fabrikam.com`, and you want to add `northwindtraders.com`, the value you need to provide would be `contoso.com, fabrikam.com, northwindtraders.com`.

  If you select multiple devices, the setting on all of the devices you select will be changed to the value you provide. If devices have different values for a setting, they'll all be updated to the same value.

SETTING	ACCEPTED VALUES	SUPPORTS BULK EDIT
Account		
Email	Email address	No
Supported meeting mode	Skype for Business (default) and Microsoft Teams Skype for Business and Microsoft Teams (default) Skype for Business Only	Yes
Modern authentication	On Off	Yes
Exchange address	Email address	No
Domain\username (optional)	Account domain and user name	No
Configure domain	Comma-separated list	Yes
Meetings		
Automatic screen sharing	On Off	Yes
Show meeting names	On Off	Yes
Auto-leave if everyone else left meeting	On Off	Yes
Device		
Dual monitor mode	On Off	Yes
Bluetooth beaconing	On Off	Yes

SETTING	ACCEPTED VALUES	SUPPORTS BULK EDIT
Automatically accept proximity-based meeting invitations	Selected Unselected	Yes
Send logs with feedback	On Off	Yes
Email address for logs and feedback	Email address	Yes
Peripherals		
Conferencing microphone	List of available microphones	No
Conferencing speaker	List of available speakers	No
Default volume	0-100	No
Default speaker	List of available speakers	No
Default volume	0-100	No
Content camera	List of available cameras	No
Content Camera Enhancements	On Off	No
Rotate Content Camera 180 degrees	On Off	No
Theming		
	Default No theme Custom List of built-in themes	Yes

Device restart options

Changes to device settings will only take effect after the devices have been restarted. When you make changes that need a restart, you can choose whether to restart the devices immediately or schedule a restart. Here are the available restart options:

- **Immediate restart** If you choose this option, all of the devices you're making changes to will restart as soon as you select this option.
- **Scheduled restart** If you choose this option, you can restart the devices you're making changes to at a time that's less disruptive to your organization.
  - **Select date and time** - Choose the specific date and time to restart the device. The date and time you choose is local to the device being restarted.
  - **Leave update for nightly reboot** Devices are restarted nightly to perform maintenance. Changes you make to devices will be applied during this restart.

Caution

Devices in use at the time of a restart will become unavailable for the duration of the restart process. They'll be

disconnected from in-progress meetings and won't be available to join new meetings.

Remove or block a device

When you **remove** a device, the device is removed from your organization and no longer appears in your list of Teams Rooms devices in the Teams admin center.

When you **block** a device, Teams no longer communicates with the device. Blocked devices won't be sent commands even if they're included in a group of devices that are being bulk-edited. It's still listed in your list of Teams Rooms devices with a status of **Blocked**.

Regardless of whether a device is blocked or removed, if it's still configured with a valid username and password, it will be automatically re-added to your Teams Rooms devices list if it connects to Microsoft 365.

To remove one or more devices, do the following:

1. Go to **Devices** > **Teams Rooms** and select the devices you want to remove.
2. Select **Remove**.

To block a device, do the following:

1. Go to **Devices** > **Teams Rooms** and select the name of the device you want to block.
2. On the device details page, select **Actions** in the top-right corner of the page.
3. Select **Block**.

To unblock a device, do the following:

1. Go to **Devices** > **Teams Rooms** and select the name of the device you want to block.
2. On the device details page, select **Actions** in the top-right corner of the page.
3. Select **Unblock**.

Download device logs

You can download a copy of a device's diagnostic log files if requested to do so by Microsoft support. Log files are compressed into a zip file that can be downloaded from the Teams admin center.

To download logs from a Teams Rooms device to your computer, do the following:

1. Go to **Devices** > **Teams Rooms** and select the name of the device you want to download logs from.
2. Select **Download device logs**. It can take several minutes for device logs to become available.
3. Select the **History** tab and then select log file link under **Diagnostics file**. A zip file containing your device's diagnostic log files will be downloaded to your browser's default Downloads folder.

View device information

From the Teams admin center, you an view the overall status of all devices in your organization and view details of each device individually.

Teams Rooms system dashboard

The Teams Rooms system dashboard shows you the status and health of all of your devices at a glance.

Device details view

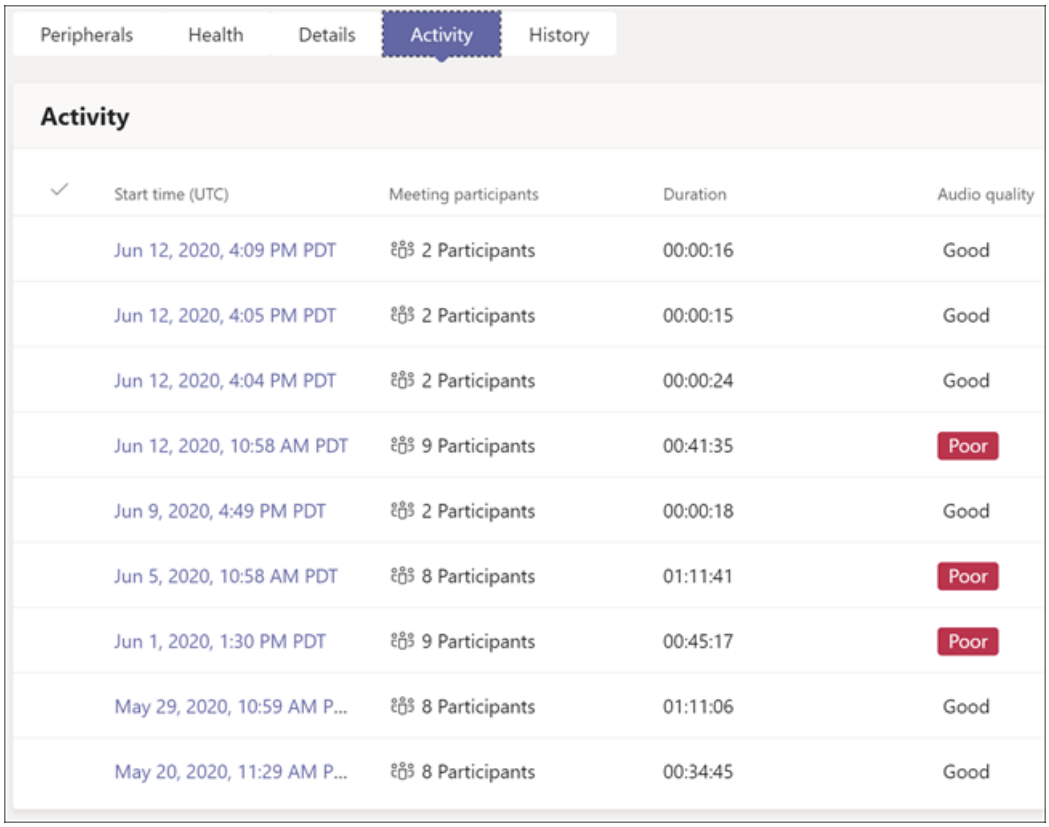
To view detailed information about a device, select its name from the device list. When in details view, you can see the following information about your device:

- **Health status** Shows the overall health of the Teams Room device. Health status can be either **Healthy** or **Unhealthy**.
- **Offline since** Shows the last time Microsoft 365 was able to communicate with the device.

- **Device status** Shows the current state of the device: **Idle**, **Teams meeting**, **Skype meeting**, or **Ingest**.
- **Peripherals** Shows the peripherals connected to your Teams Room device and their health status. Health status can be either **Connected** or **Disconnected**.
- **Health** Shows detailed information about the peripherals connected to your Teams Room device, network connectivity, sign in status to required services, and software version information.
- **Details** Shows manufacturer information, network IP address, and Teams Room device serial/MAC address.
- **Activity** Shows past meeting details including date and time of the meeting, number of participants, duration, and audio quality. For more information about meeting details, see the Meeting activity details section later in this article.
- **History** Shows a history of management activity on the Teams Room device, including configuration updates, device restarts, and device log download links.

Meeting activity details

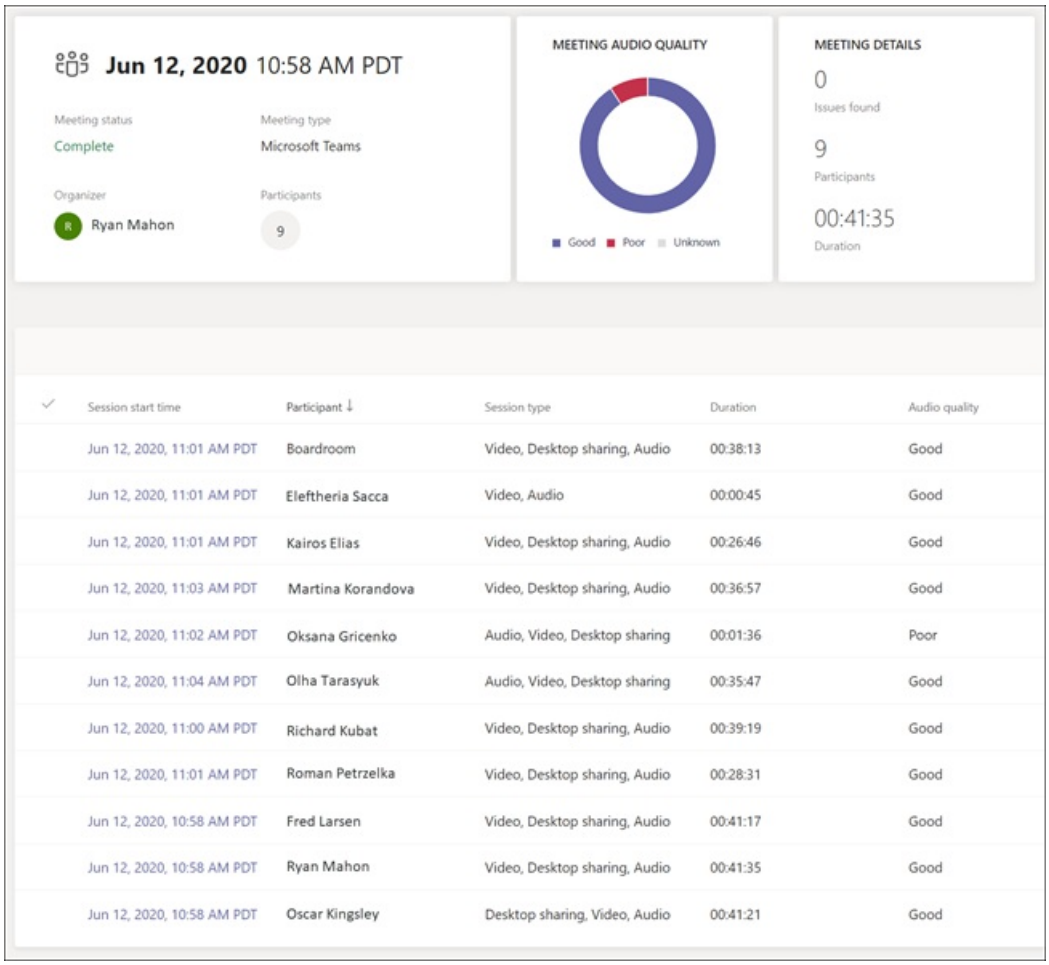
The **Activity** tab in Teams Room device details shows high-level and detailed information about all of the meetings the device has participated in over time. In the **Activity** tab, you can see when a meeting was held, how many participants attended the meeting, and the quality of audio during the meeting.



To see the detail information about a specific meeting, select the date and time of the meeting you want more information about. If a meeting has only two participants, you'll see the participant details page, otherwise you'll see a participant summary page.

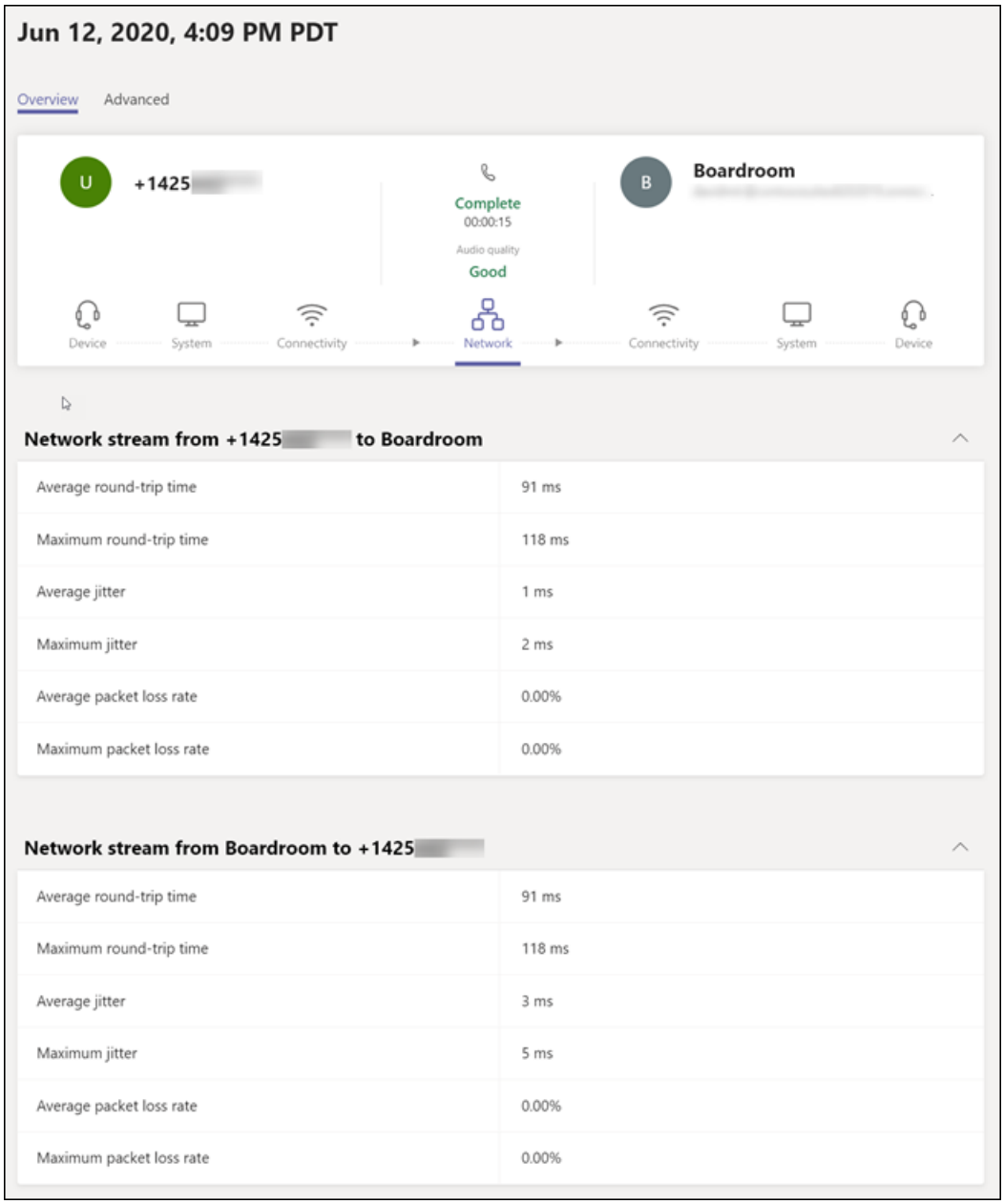
Participant summary

The participant summary page shows all of the participants that attended the meeting. You can see when each participant joined the meeting, their name, audio quality, and what features were used during their session. To view the details of a participant's session, select the session start time for that participant.



Participant details

The participant details page shows end-to-end diagnostic information for that participant's session. As shown in the following graphic, **Device**, **System**, and **Connectivity** information is provided for the participant and for the Teams Rooms device. **Network** diagnostic information between the participant and the Teams Rooms device is also provided. Select the icon for the context you want more information about. For additional diagnostic information, select the **Advanced** tab.


Jun 12, 2020, 4:09 PM PDT
Overview
Advanced
U
+1425
Complete
00:00:15
Audio quality
Good
B
Boardroom
Device
System
Connectivity
Network
Connectivity
System
Device
Network stream from +1425 to Boardroom
Average round-trip time
91 ms
Maximum round-trip time
118 ms
Average jitter
1 ms
Maximum jitter
2 ms
Average packet loss rate
0.00%
Maximum packet loss rate
0.00%
Network stream from Boardroom to +1425
Average round-trip time
91 ms
Maximum round-trip time
118 ms
Average jitter
3 ms
Maximum jitter
5 ms
Average packet loss rate
0.00%
Maximum packet loss rate
0.00%

Microsoft Teams Rooms maintenance and operations

8/3/2020 • 9 minutes to read • Edit Online

Read this topic to learn about management of Microsoft Teams Rooms, the next generation of Skype Room Systems.

Microsoft Teams Rooms is Microsoft's latest conferencing solution designed to transform your meeting room into a rich, collaborative experience. Users will enjoy its familiar Microsoft Teams or Skype for Business interface and IT administrators will appreciate an easily deployed and managed Windows 10 Skype Meeting app. Microsoft Teams Rooms is designed to leverage existing equipment like LCD panels for ease of installation to bring Microsoft Teams or Skype for Business into your meeting room.

With additional configuration, remote management is possible using Microsoft Azure Monitor as described in Plan Microsoft Teams Rooms management with Azure Monitor, Deploy Microsoft Teams Rooms management with Azure Monitor, Manage Microsoft Teams Rooms devices with Azure Monitor. You may also Manage Microsoft Teams Rooms console settings remotely with an XML configuration file, which includes applying a Custom display theme.

Collecting logs on Microsoft Teams Rooms

To collect logs, you must invoke the log collection script that ships with the Microsoft Teams Rooms app. In Admin mode, start an elevated command prompt, and issue the following command:

```
powershell -ExecutionPolicy unrestricted c:\rigel\x64\scripts\provisioning\ScriptLaunch.ps1
CollectSrsV2Logs.ps1
```

The logs will be output as a ZIP file in c:\rigel.

Front of Room Display Settings

Configure the Front of Room display to Extended mode. Doing so will ensure that the console UI is not duplicated on that display when you cycle power on the display.

> **NOTE**
> If you desire a front of room display to automatically switch to an active video source (such as an MTR console) when the source wakes from standby mode, certain conditions must be met. This feature is optional but supported by Microsoft Teams Rooms software, provided underlying hardware supports the feature. A consumer TV used as a front of room display needs to support the Consumer Electronics Control (CEC) feature of HDMI. Depending on the dock or console selected (which might not support CEC, refer to manufacturer support documentation), a controller such as an HD-RX-201-C-E from Crestron or Extron HD CTL 100 from Extron may be needed to enable the desired behavior.

Microsoft Teams Rooms Reset (Factory Restore)

If Microsoft Teams Rooms isn't running well, performing a factory reset might help. To do this, use the Microsoft Teams Room recovery tool and follow the factory restore instructions.

> **NOTE**
>
> There is a known issue where the Microsoft Teams Rooms can become unusable if the **Keep my files - Removes Apps and settings, but keeps your personal files** option is selected during the Windows Reset process. Do *not* use this option.

Supported Remote Options

The following table summarizes the possible remote operations and the methods you can use to accomplish them.

WORKGROUP	NOT DOMAIN JOINED	DOMAIN JOINED
Restart	Remote desktop Remote Powershell	Remote desktop (requires further configuration) Remote Powershell (requires further configuration) Configuration Manager
Update OS	Windows Update	Windows Update WSUS
App update	Windows Store	Windows Store Configuration Manager
Skype Account Config	Not currently supported	Not currently supported
Access logs	Not currently supported	Not currently supported

Configuring Group Policy for Microsoft Teams Rooms

This section covers system settings that Microsoft Teams Rooms depends on to function properly. When joining Microsoft Teams Rooms to a domain, ensure that your group policy doesn't override the settings in the following table.

SETTING	ALLOWS
HKLM\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon AutoAdminLogon = (REG_SZ) 1	Enables Microsoft Teams Rooms to boot up
Power Management -> On AC, turn screen off after 10 minutes Power Management -> On AC, never put system to sleep	Enables Microsoft Teams Rooms to turn off attached displays and wake up automatically
net accounts /maxpwage:unlimited Or equivalent means of disabling password expiration on the local account. Failure to do this will eventually cause the Skype account to fail logon complaining about an expired password. Note that this impacts all local accounts on the machine, and thus failure to set this will also cause the administrative account on the box to eventually expire as well.	Enables Skype account to always log in

Transferring files using Group Policies is discussed in Configure a File Item.

> **NOTE**
>
> When Microsoft Teams Rooms device is compatible with the next version of Windows 10 OS, the device automatically updates to the next version through Windows Update. Microsoft Teams Rooms device should not be upgraded to next release of Windows 10 manually or via enabling Windows Update for Business (WUFB) group policies “Select the Windows readiness level for the updates you want to receive” and "Select when Preview Builds and Feature Updates are received" through GPO. A device with these group policies enabled is known to run into issues with Windows 10 OS update by Microsoft Teams Rooms app.

Remote Management using PowerShell

You can perform the following management operations remotely by using PowerShell (see the table below for script samples):

- Get attached devices
- Get app status
- Get system info
- Reboot system
- Retrieve logs
- Transfer files (requires a domain-joined Microsoft Teams Rooms)

> **NOTE**
>
> This functionality is off by default. You need to enable remote PowerShell for your environment on the Microsoft Teams Rooms system to perform the operations below. Refer to the documentation on **Enable-PSRemoting** for information about how to enable remote PowerShell.

For example, you can enable Remote PowerShell as follows:

1. Sign in as Admin on a Microsoft Teams Rooms device.
2. Open an elevated PowerShell command prompt.
3. Enter the following command: `Enable-PSRemoting -SkipNetworkProfileCheck -Force`
4. Open the Local Security Policy and add the *Administrators* security group to **Security Settings** > **Local Policies** > **User Rights Assignment** > **Access this computer from the network**.

To perform a management operation:

1. Sign in to a PC with account credentials that have permission to run PowerShell commands on a Microsoft Teams Rooms device.
2. Open a regular PowerShell command prompt on the PC.
3. Copy the command text from the table below and paste it at the prompt.
4. Replace `<Device fqdn>` fields with FQDN values appropriate to your environment.
5. Replace *<path>* with the file name and local path of the master SkypeSettings.xml configuration file (or Theme image).

To Get Attached Devices

```
invoke-command {Write-Host "VIDEO DEVICES:"
gwmi -Class Win32_PnPEntity | where {$_.PNPClass -eq "Image"} | Format-Table Name,Status,Present; Write-Host
"AUDIO DEVICES:"
gwmi -Class Win32_PnPEntity | where {$_.PNPClass -eq "Media"} | Format-Table Name,Status,Present; Write-Host
"DISPLAY DEVICES:"
gwmi -Class Win32_PnPEntity | where {$_.PNPClass -eq "Monitor"} | Format-Table Name,Status,Present} -
ComputerName <Device fqdn>
```

Get App Status

```
invoke-command { $package = get-appxpackage -User Skype -Name Microsoft.SkypeRoomSystem; if ($package -eq
$null) {Write-host "SkypeRoomSystems not installed."} else {write-host "SkypeRoomSystem Version : "
$package.Version}; $process = Get-Process -Name "Microsoft.SkypeRoomSystem" -ErrorAction SilentlyContinue; if
($process -eq $null) {write-host "App not running."} else {$process | format-list StartTime,Responding}}  -
ComputerName <Device fqdn>
```

Get System Info

```
invoke-command {gwmi -Class Win32_ComputerSystem | Format-List
PartOfDomain,Domain,Workgroup,Manufacturer,Model
gwmi -Class Win32_Bios | Format-List SerialNumber,SMBIOSBIOSVersion} -ComputerName <Device fqdn>
```

Reboot System

```
invoke-command { Shutdown /r /t 0 } -ComputerName <Device fqdn>
```

Retrieve Logs

```
$targetDevice = "<Device fqdn> "
$logFile = invoke-command {$output = Powershell.exe -ExecutionPolicy Bypass -File
C:\Rigel\x64\Scripts\Provisioning\ScriptLaunch.ps1 CollectSrsV2Logs.ps1
Get-ChildItem -Path C:\Rigel\*.zip | Sort-Object -Descending -Property LastWriteTime | Select-Object -First 1}
-ComputerName $targetDevice
$session = new-pssession -ComputerName $targetDevice
Copy-Item -Path $logFile.FullName -Destination .\ -FromSession $session; invoke-command {remove-item -force
C:\Rigel\*.zip} -ComputerName $targetDevice
```

Push an XML configuration file (or theme graphic)

```
$movefile = "<path>";
$targetDevice = "\\<Device fqdn>
\Users\Skype\AppData\Local\Packages\Microsoft.SkypeRoomSystem_8wekyb3d8bbwe\LocalState\SkypeSettings.xml";
Copy-Item $movefile $targetDevice
```

Software updates

By default, Microsoft Teams Rooms attempts to connect to the Windows Store to get the latest version of Microsoft Teams Rooms software, so the device will require regular internet access. Before contacting Microsoft with support issues, be sure the Microsoft Teams Rooms device is loaded with the latest version of the app.

By default, Microsoft Teams Rooms connects to Windows Update to retrieve operating system and USB peripheral device firmware updates, and installs them outside of configured business hours. You can configure business hours by signing into the administrator account and running the Settings app.

If you want to manage updates manually, and are unable to follow the normal procedure for Microsoft Store for

Business to Distribute offline apps, you can acquire the appropriate APPX file and dependencies from the deployment kit (from the instructions to Configure a Microsoft Teams Rooms console) that can be used with Configuration Manager. The deployment kit release lags behind the store release, so it might not always match the latest available build.

To update using Powershell

1. Extract the package from the installation MSI to a share the device can access.
2. Run the following script targeting the Microsoft Teams Rooms devices, changing <share> to the device share as appropriate:

```
Add-AppxPackage -Update -ForceApplicationShutdown -Path '\\
<share>\$oem$\$1\Rigel\x64\Ship\AppPackages\*\*.appx' -DependencyPath (Get-ChildItem '\\
<share>\$oem$\$1\Rigel\x64\Ship\AppPackages\*\Dependencies\x64\*.appx' | Foreach-Object {$_.FullName})
```

Admin mode and device management

Some management functions, like manually installing a private CA certificate, require placing the Surface Pro device in Admin mode.

Switching to Admin Mode and back when the Microsoft Teams Rooms app is running

1. Hang up any ongoing calls, and return to the home screen.
2. Select the Gear icon and bring up the menu (options are **Settings**, **Accessibility**, and **Restart Device**).
3. Select **Settings**.
4. Enter the Administrator Password. The Setup screen will appear. If the device isn't domain-joined, the local administrative account (username "Admin") will be used by default. The default password for this account is 'sfb', change the password as soon as possible. If the machine is domain-joined, you can sign in with an appropriately privileged domain account.
5. Select **Windows Settings** in the left column.
6. Choose **Go to Admin Sign-in**.
7. Enter the Administrator Password. This will gracefully log off the app and take you to the Windows login screen.
8. Log in to the desktop with your administrative credentials. You'll have the necessary privileges to manage the device.
9. Perform the necessary administrative tasks.
10. Sign out from the Admin account.
11. Return to Microsoft Teams Rooms by selecting the user account icon on the far left side of the screen and then selecting **Skype**.

    If the **Skype** user is not listed, you might have to select **other user** and enter **.\skype** as the user name, and sign in.

The console is now back in its normal operation mode.The following procedure requires you to attach a keyboard to the device if one is not already attached.

Switching to Admin Mode and back when the Microsoft Teams Rooms app crashes

1. Press the Windows key five times in rapid succession. This will bring you to the Windows logon screen.

2. Log in to the desktop with your administrative credentials.
3. Perform the necessary administrative tasks.
4. Restart the machine when you're finished.

> **NOTE**
> This method doesn't log the Skype user off or gracefully terminate the app, but you'd use it if the app wasn't responding and the other method wasn't available.

The console restarts into its normal operation mode, running the Microsoft Teams Rooms app. You can remove the keyboard, if it was attached to allow you to perform this procedure.

Troubleshooting tips

- Meeting invitations might not appear when sent across domain boundaries (for example, between two companies). In such cases, IT admins should decide whether to allow external users to schedule a meeting.
- Microsoft Teams Rooms doesn't support Exchange AutoDiscover redirects via Exchange 2010.
- In general, it's a good practice for IT admins to disable any audio endpoints they don't intend to use.
- In the event that a mirror image is displayed in room preview, the IT admin can correct by cycling camera power or flipping the image orientation using the camera remote control.
- Loss of console touchscreen access has been known to occur. In such cases, the issue is sometimes resolved by restarting the Microsoft Teams Rooms system.
- Loss of local audio when connecting a PC to console via wired ingest has been known to occur. In such cases, restarting the PC can resolve the local audio playback issue.

Known issues

9/21/2020 • 3 minutes to read • Edit Online

This article lists the known issues for Microsoft Teams Rooms, by feature area.

Update

ISSUE TITLE	BEHAVIOR / SYMPTOM	KNOWN WORKAROUND	KB ARTICLE
Application not launching	After updating to application version 4.4.41.0, the system boots to black screen, or go to the logon screen after few minutes.	Follow the steps in Microsoft Teams Rooms application does not start after update to version 4.4.41.0 to fix this issue.	None
SfB meetings content sharing does not show full screen	In Skype for Business meetings, rooms with front of room displays using high DPI settings may experience issues where content shared into a meeting doesn't show the full screen on the front of room display. This is caused by an underlying issue in the Windows 10 Remote Desktop Protocol (RDP) API.	Use the `<WinRTRdpEnabled>` XML setting to disable the Windows 10 RDP API to resolve this issue. To disable, you need to specify the value as `false`. For more information, see Managing console settings with an XML configuration file.	None
App out of date	The Microsoft Teams Rooms console shows a "system config out of date" error.	Use the Microsoft Teams Rooms recovery tool	None

ISSUE TITLE	BEHAVIOR / SYMPTOM	KNOWN WORKAROUND	KB ARTICLE
Device updated to unsupported version of Windows 10	Windows 10 device updated from version 1803 to version 1809, which is not supported. The supported version is 1903.	This can happen if the Group Policy or MDM setting for DeferFeatureUpdatesPeriodinDays setting, which lets you defer feature updates for a specified number of days, is set to the maximum of 365 days. Windows 10 version 1809 isn't supported with Microsoft Teams Rooms, while version 1903 is supported. However, as of March 27, 2020, version 1809 is over 365 days old. If this setting isn't changed, Windows attempts to install version 1809, which may cause issues with Microsoft Teams Rooms. To avoid this situation, **remove** any Group Policy or MDM setting for deferring updates. This allows Windows to update to the latest, supported OS version. **IMPORTANT** The Group Policy or MDM setting must be **removed** (left unconfigured) and **not set to 0**. If the policy is set to 0, Windows takes the latest available version which may not be supported.	None

User interface

ISSUE TITLE	BEHAVIOR / SYMPTOM	KNOWN WORKAROUND	KB ARTICLE
Virtual keyboard missing	The virtual keyboard doesn't appear when you need to enter information in Microsoft Teams Rooms. This issue occurs in Windows 10, version 1903.	Install 2020-04 Cumulative Update for Windows 10, version 1903 for x64-based Systems through Windows Updates.	None

Hardware

ISSUE TITLE	BEHAVIOR / SYMPTOM	KNOWN WORKAROUND	KB ARTICLE

ISSUE TITLE	BEHAVIOR / SYMPTOM	KNOWN WORKAROUND	KB ARTICLE
Monitors not detected	When you run Microsoft Teams Rooms on a Surface Pro (Model 2017) device, monitors are not detected.	Hold down the Surface Pro power button for 20 or more seconds. When you do this, the device restarts and clears the graphics cache.	KB4055681

Limitations and expected behaviors

Microsoft Teams Rooms does not support HDCP input, which has been observed to cause issues with HDMI ingest functionality (video, audio). Take care to ensure that switches connected to Microsoft Teams Rooms have HDCP options turned off.

If you desire a front of room display to automatically switch to an active video source (such as an MTR console) when the source wakes from standby mode, certain conditions must be met. This feature is optional but supported by Microsoft Teams Rooms software, provided underlying hardware supports the feature. A consumer TV used as a front of room display needs to support the Consumer Electronics Control (CEC) feature of HDMI. Depending on the dock or console selected (which might not support CEC, refer to manufacturer support documentation), a controller such as an HD-RX-201-C-E from Crestron or Extron HD CTL 100 from Extron may be needed to enable the desired behavior.

Always use a wired 1-Gbps network connection to assure you have the needed bandwidth.

If your Microsoft Teams Rooms device loses trust with the domain, you won't be able to authenticate into the device and open up Settings. For example, if you remove the Microsoft Teams Rooms from the domain after it is domain joined, trust is lost. The workaround is to log in with the local Admin account.

Microsoft Teams Rooms is a multi-window application and requires a front of room display to be connected to the HDMI port of the device, for the app to function correctly. Make sure that you either have an HDMI display connected or use a dummy HDMI plug if you are testing and do not have a display purchased yet.

See also

Microsoft Teams Rooms help

Manage Microsoft Teams Rooms

Manage Microsoft Teams Rooms devices with Azure Monitor

4/27/2020 • 4 minutes to read • Edit Online

This article discusses how to manage Microsoft Teams Rooms devices in an integrated manner using Azure Monitor.

You can configure Azure Monitor to provide basic telemetry to help you manage Skype meeting room devices. See Plan Microsoft Teams Rooms management with Azure Monitor and Deploy Microsoft Teams Rooms management with Azure Monitor for details. As your management solution matures, you can use additional data and management capabilities to create a more detailed view of device performance.

Understand the log entries

The following event descriptions are inserted into the event log description field every five minutes, when the Microsoft Teams Rooms app records the corresponding information in the Windows event log. The Microsoft Monitoring Agent passes these records to Log Analytics in Azure Monitor, which parses them into the dashboard you created in Deploy Microsoft Teams Rooms management with Azure Monitor. With the dashboard, you can look at individual log entries to determine courses of action if needed.

Event IDs 2000 and 3000 indicate that the device in question is working as expected. Event IDs 2001 and 3001 indicate that an issue was found. Event ID 4000 may require action if seen more often than you expect, compared to a baseline you set or to other deployed devices in your organization.

Understanding these event descriptions alerts you to problems quickly, and provides a starting point for further troubleshooting.

EVENT ID LEVEL	EVENT BEHAVIOR	EVENT DESCRIPTION
2000 Information	This is a healthy heartbeat event. Every 5 minutes, Microsoft Teams Rooms checks that it is signed in to Microsoft Teams or Skype for Business and has network and Exchange connectivity. If all 3 factors are true, it writes Event ID 2000 into the event log every 5 minutes until the device is offline or one or more of the conditions is no longer met.	{"Description":"Heartbeat is healthy.", "ResourceState":"Healthy", "OperationName":"Heartbeat", "OperationResult":"Pass", "OS":"Windows 10", "OSVersion":"10.0.14393.693", "Alias":"alias@contoso.com", "DisplayName":"Display name", "AppVersion":"1.0.38.0", "IPv4Address":"10.10.10.10", "IPv6Address":"IP v6 address"} In this example, all heartbeat conditions were met and the Microsoft Teams Rooms device was marked as healthy. If there were errors, the app would record Event ID 2001 instead.

EVENT ID LEVEL	EVENT BEHAVIOR	EVENT DESCRIPTION
2001 Error	This is an app error event. Every 5 minutes, Microsoft Teams Rooms checks that it is signed in to Microsoft Teams or Skype for Business with network and Exchange connectivity. If one or more factors are not true, it writes EventID 2001 into the event log every 5 minutes until the device is offline or all conditions are met once again.	{"Description":"Network status : Healthy. Exchange status : Connected. **Signin status: Unhealthy.** ", "ResourceState":"Unhealthy", "OperationName":"Heartbeat", "OperationResult":"Fail", "OS":"Windows 10", "OSVersion":"10.0.14393.693", "Alias":"", "DisplayName":"Display Name", "AppVersion":"1.0.38.0", "IPv4Address":"10.10.10.10", "IPv6Address":"ip v6 address"} In this example, Microsoft Teams Rooms determined that the network connection was healthy and the app was connected to Exchange, but the bolded portion indicates that the app is not connected. This could be a configuration issue on the device or host. The Network status shows as either Healthy or Unhealthy. If the status is unhealthy, you may have a network issue or the device may have been unplugged (but then you would probably also have Exchange and Microsoft Teams or Skype for Business errors). The Exchange Status shows as either Connected or one of the following: Disconnected, Connecting, AutodiscoveryError (the most commonly seen error), GeneralError, or ServerVersionNotSupported. If the status is Connecting, wait until the next health message is sent, for other errors refer the issue to an admin with experience in solving Exchange issues. The Signin status (indicating the app is signed in) shows as either Healthy or Unhealthy. If the status is unhealthy, send a technician to investigate further.

EVENT ID LEVEL	EVENT BEHAVIOR	EVENT DESCRIPTION
3000 Information	This event verifies that a hardware check was run and found to be healthy. Every 5 minutes Microsoft Teams Rooms checks that configured hardware components such as front of room display, microphone, speaker, and camera are connected and functioning. If all components are healthy, it writes EventID 3000 into the event log. This event is written every 5 minutes unless there is an issue with a connected device.	{"Description":"HardwareCheckEngine is healthy.", "ResourceState":"Healthy", "OperationName":"HardwareCheckEngine", "OperationResult":"Pass", "OS":"Windows 10", "OSVersion":"10.0.14393.693", "Alias":"alias@contoso.com", "DisplayName":"Display Name", "AppVersion":"1.0.38.0", "IPv4Address":"10.10.10.10", "IPv6Address":"ip v6 address"} In this example, all hardware checks were passed. If there were errors, the app would record Event ID 3001 instead.
3001 Error Event	This is a hardware error event. The Microsoft Teams Rooms app has a process that checks the health of connected hardware components (front of room, microphone, speaker, camera) every 5 minutes. If one or more of the components are unhealthy, it writes EventID 3001 into the event log. This event is written every 5 minutes until the issue with the device is fixed.	{"Description":" **Front of Room Display status : Unhealthy.** Configured display count is 2. Real display count is 0. **Conference Microphone status : Unhealthy.** Conference Speaker status : Healthy. Default Speaker status : Healthy. Camera status : Healthy.", "ResourceState":"Unhealthy", "OperationName":"HardwareCheckEngine", "OperationResult":"Fail", "OS":"Windows 10", "OSVersion":"10.0.14393.1198", "Alias":"alias@contoso.com", "DisplayName":"Yosemite conference room", "AppVersion":"2.0.58.0", "IPv4Address":"10.10.10.10", "IPv6Address":"IPv6Address", "IPv4Address2":"10.10.10.10"} Hardware peripherals are shown as either Healthy or Unhealthy. In this example, there are two front of room displays configured, and currently neither of them is available. The Conference Microphone status is unhealthy, which could have several possible causes. Since at least one resource did not pass the check, the ResourceState is listed as Unhealthy. Send a technician to investigate further.

EVENT ID LEVEL	EVENT BEHAVIOR	EVENT DESCRIPTION
4000 Information	This is an App Restart event. Every time the app is restarted, it will log this event into the Windows event log.	{"Description":"App restarts.", "ResourceState":"Healthy", "OperationName":"Restart", "OperationResult":"Pass", "OS":"Windows 10", "OSVersion":"10.0.14393.693", "Alias":"alias@domain.com", "DisplayName":"Display Name", "AppVersion":"1.0.38.0", "IPv4Address":"10.10.10.10", "IPv6Address":"ip v6 address"} The app may restart for various reasons. Compare the restart frequency of devices in the same building and in different buildings. Keep in mind known issues like power fluctuations and failures, as this may provide clues to infrastructure problems.

Related topics

Plan Microsoft Teams Rooms management with Azure Monitor

Deploy Microsoft Teams Rooms management with Azure Monitor

Manage a Microsoft Teams Rooms console settings remotely with an XML configuration file

11/2/2020 • 10 minutes to read • Edit Online

This article discusses remote management of the default settings used by a Microsoft Teams Rooms device, including applying a custom theme. It discusses how to create a master settings file, and links to discussions of how to place them as needed on the remotely managed devices.

It is possible for you to change default settings of remotely managed devices by updating a master XML file and sending copies to the managed consoles. You can also implement Custom Themes on your Microsoft Teams Rooms consoles with XML configuration files.

Create an XML configuration file

Any text editor can be used to create a settings file. The **XML Elements** table explains the elements shown in this sample SkypeSettings.xml (required file name) configuration file.

```
<SkypeSettings>
    <AutoScreenShare>true</AutoScreenShare>
    <HideMeetingName>true</HideMeetingName>
    <UserAccount>
        <SkypeSignInAddress>RanierConf@contoso.com</SkypeSignInAddress>
        <ExchangeAddress>RanierConf@contoso.com</ExchangeAddress>
        <ModernAuthEnabled>false</ModernAuthEnabled>
        <DomainUsername>Seattle\RanierConf</DomainUsername>
        <Password>password</Password>
        <ConfigureDomain>domain1, domain2</ConfigureDomain>
    </UserAccount>
    <IsTeamsDefaultClient>false</IsTeamsDefaultClient>
    <BluetoothAdvertisementEnabled>true</BluetoothAdvertisementEnabled>
    <AutoAcceptProximateMeetingInvitations>false</AutoAcceptProximateMeetingInvitations>
    <SkypeMeetingsEnabled>false</SkypeMeetingsEnabled>
    <TeamsMeetingsEnabled>true</TeamsMeetingsEnabled>
    <WebExMeetingsEnabled>true</WebExMeetingsEnabled>
    <UseCustomInfoForThirdPartyMeetings>true</UseCustomInfoForThirdPartyMeetings>
    <CustomDisplayNameForThirdPartyMeetings>Rainier Conference Room</CustomDisplayNameForThirdPartyMeetings>
    <CustomDisplayEmailForThirdPartyMeetings>RanierConf@contoso.com</CustomDisplayEmailForThirdPartyMeetings>
    <DualScreenMode>true</DualScreenMode>
    <DuplicateIngestDefault>false</DuplicateIngestDefault>
    <SendLogs>
        <EmailAddressForLogsAndFeedback>RanierConf@contoso.com</EmailAddressForLogsAndFeedback>
        <SendLogsAndFeedback>true</SendLogsAndFeedback>
    </SendLogs>
    <Devices>
        <MicrophoneForCommunication>Microsoft LifeChat LX-6000</MicrophoneForCommunication>
        <SpeakerForCommunication>Realtek High Definition Audio</SpeakerForCommunication>
        <DefaultSpeaker>Polycom CX5100</DefaultSpeaker>
        <ContentCameraId>USB\VID_046D&amp;PID_0843&amp;MI_00\7&amp;17446CF2&amp;0&amp;0000</ContentCameraId>
        <ContentCameraInverted>false</ContentCameraInverted>
        <ContentCameraEnhancement>true</ContentCameraEnhancement>
    </Devices>
    <Theming>
        <ThemeName>Custom</ThemeName>
        <CustomThemeImageUrl>file name</CustomThemeImageUrl>
        <CustomThemeColor>
            <RedComponent>100</RedComponent>
            <GreenComponent>100</GreenComponent>
            <BlueComponent>100</BlueComponent>
        </CustomThemeColor>
    </Theming>
    <CoordinatedMeetings enabled="true">
        <TrustedAccounts>room@contoso.com</TrustedAccounts>
        <Settings>
            <Audio default="false" enabled="false" />
            <Video default="false" enabled="true" />
            <Whiteboard default="false" enabled="false"/>
        </Settings>
    </CoordinatedMeetings>
</SkypeSettings>
```

If a variable value is of the wrong type, elements are out of order, elements are unclosed, or another error is found, the XML file is *badly formed*. While processing a badly formed XML file, settings found up to the point where the error occurs are applied, then the rest of the file is ignored. Any unknown elements in the XML are ignored. If a parameter is omitted, it remains unchanged on the device. If a parameter value is invalid, its prior value remains unchanged.

XML elements

ELEMENT	TYPE	LEVEL	USAGE
<SkypeSettings>	Container for all elements.		Required.
<AutoScreenShare>	Boolean ❷	First ❶	If true, auto screen share is enabled.
<HideMeetingName>	Boolean ❷	First ❶	If true, meeting names are hidden.
<UserAccount>	Container	First ❶	Container for credentials parameters. The sign-in address, Exchange address, or email address are usually the same, such as RainierConf@contoso.com.
<SkypeMeetingsEnabled>	Boolean ❷	First ❶	Enabled by default.
<SkypeSignInAddress>	String ❸		The sign-in name for the console's SfB or Teams device account.
<ExchangeAddress>	String ❸		The sign-in name for the console's Exchange device account. If the ExchangeAddress is omitted, the SkypeSignInAddress will not be reused automatically.
<ModernAuthEnabled>	Boolean ❷		Disabled by default. When set to true, the Microsoft Teams Rooms application only uses modern authentication to connect to resources and doesn't fall back to basic authentication.
<DomainUsername>	String ❸		The domain and user name of the console device, for example Seattle\RanierConf.
<Password>	String 3		The password parameter is the same password used for the Skype for Business device account sign-in.
<ConfigureDomain>	String ❸		You can list several domains, separated by commas.

ELEMENT	TYPE	LEVEL	USAGE
<TeamsMeetingsEnabled>	Boolean ❷	First ❶	Disabled by default. The XML file is considered badly formed if both <SkypeMeetingsEnabled> and<TeamsMeetingsEnabled > are disabled, but it's acceptable to have both settings enabled at the same time.
<IsTeamsDefaultClient>	Boolean ❷	First ❶	Disabled by default.
<WebExMeetingsEnabled>	Boolean ❷	First ❶	Disabled by default. If true, enables direct guest join experience for Cisco Webex meetings.
<UseCustomInfoForThirdPartyMeetings>	Boolean ❷	First ❶	Disabled by default and uses conference room account info to join third party meetings. If this value is set to true, you must specify both <CustomDisplayNameForThirdPartyMeetings>, <CustomDisplayEmailForThirdPartyMeetings> must be specified.
<CustomDisplayNameForThirdPartyMeetings>	String ❸	First ❶	Specify guest name used to join third party meetings. Third party service will display this data in their experience and may store in their service.
<CustomDisplayEmailForThirdPartyMeetings>	String ❸	First ❶	Specify guest email used to join third party meetings. Third party service will display this data in their experience and may store in their service.
<BluetoothAdvertisementEnabled>	Boolean ❷	First ❶	Enabled by default.
<AutoAcceptProximateMeetingInvitations>	Boolean ❷	First ❶	If true, proximity based meetings are automatically accepted. Disabled by default.
<DualScreenMode>	Boolean ❷	First ❶	If true, dual screen mode is enabled. Otherwise the device uses single screen mode.

ELEMENT	TYPE	LEVEL	USAGE
<DuplicateIngestDefault>	Boolean ❷	First ❶	If true, content is shown on both screens in dual screen mode, when out of meeting.
<DisableTacCommunication>	Boolean ❷	First ❶	If true, all communication with Teams Admin Center device management will be disabled.
<SendLogs>	Container	First ❶	
<EmailAddressForLogsAndFeedback>	String ❸		Sets an optional email address that logs can be sent to when the "Give Feedback" window appears.
<SendLogsAndFeedback>	Boolean ❷		If true, logs are sent to the admin. If false, only feedback is sent to the admin (and not logs).
<Devices>	Container	First ❶	The connected audio device names in the child elements are the same values listed in the Device Manager app. The configuration can contain a device that does not presently exist on the system, such as an A/V device not currently connected to the console. The configuration would be retained for the respective device.
<MicrophoneForCommunication>	String ❸		Sets the microphone used as the recording device in a conference.
<SpeakerForCommunication>	String ❸		Device to be used as speaker for the conference. This setting is used to set the speaker device used in a call.
<DefaultSpeaker>	String ❸		Device to be used to play the audio from an HDMI ingest source.
<ContentCameraId>	String ❸		Define the instance path for the camera configured in room to share analog whiteboard content in a meeting. See Locate the Content camera USB instance path.

ELEMENT	TYPE	LEVEL	USAGE
<ContentCameraInverted>	Boolean ❷		Specify if the content camera is physically installed upside down. For content cameras that support automatic rotation, specify false.
<ContentCameraEnhancement>	Boolean ❷		When set to true (the default), the content camera image is digitally enhanced: the whiteboard edge is detected and an appropriate zoom is selected, ink lines are enhanced, and the person writing on the whiteboard is made transparent. Set to false if you intend to send a raw video feed to meeting participants for spaces where a whiteboard is not drawn on with a pen and instead the camera is used to show sticky notes, posters, or other media.
<Theming>	Container	First ❶	One of the features that can be applied with an XML file is a Custom Theme for your organization. You are able to specify a theme name, background image, and color.
<ThemeName>	String ❸		Used to identify the theme on the client. The Theme Name options are Default, one of the provided preset themes, or Custom. Custom theme names always use the name *Custom*. The client UI can be set at the console to the Default or one of the presets, but use of a custom theme must be set remotely by an Administrator. Preset themes include: Default Blue Wave Digital Forest Dreamcatcher Limeade Pixel Perfect Roadmap Sunset To disable the current theme, use "No Theme" for the ThemeName.

ELEMENT	TYPE	LEVEL	USAGE
<CustomThemeImageUrl>	String ❸		Required for a custom theme, otherwise optional. Input the file name only. For more information on the custom theme image, see the Custom Theme Images section.
<CustomThemeColor>	Container		Container for the <RedComponent>, <GreenComponent>, and <BlueComponent> values. These values are required for a custom theme.
<RedComponent>	Byte (0-255)		Represents the red color component.
<GreenComponent>	Byte (0-255)		Represents the green color component.
<BlueComponent>	Byte (0-255)		Represents the blue color component.
<CoordinatedMeetings>	Boolean ❷	First ❶	Container for the configuration elements for Coordinated Meetings. This element has one attribute: • **enabled** Determines whether Teams is configured to participate in Coordinated Meetings with other devices.
<TrustedAccounts>	String		This is a comma-separated list of UPNs for each Teams Room device or Surface Hub that the device should accept meeting join requests from, or to which meeting join requests should be sent.
<Settings>	Container		Container for the configuration audio and video configuration elements for Coordinated Meetings.

ELEMENT	TYPE	LEVEL	USAGE
<Audio>	Boolean ❷		Controls audio configuration on a Teams Rooms device. This element has two attributes: • **default** Determines on which device the microphone will be active when a meeting starts. Only one device (typically a Teams Rooms device) can have this field set to `true` while the rest of the devices must have this field set to `false` to avoid audio echo and feedback. • **enabled** Determines whether participants in a meeting can toggle the microphone on or off. Devices on which **Audio default** is set to `false` should have this setting set to `false` so that participants can't accidentally turn on a microphone and cause audio echo or feedback. If **Audio default** is set to `true`, the **Audio enabled** setting is ignored and participants can mute or unmute the microphone.

ELEMENT	TYPE	LEVEL	USAGE
<Video>	Boolean ❷		Controls video configuration on a Teams Rooms device. This element has two attributes: • **default** Determines on which device the camera will be active when a meeting starts. For the best experience, we recommend that only the Teams Rooms device be set to `true` while all other devices are set to `false`. • **enabled** Determines whether participants in a meeting can toggle the camera on or off. You can set this to `true` on any other devices in the event participants want to share different video perspectives (such as if a participant is using the Surface Hub whiteboard). If you don't want participants to turn a camera on or off on a device, set this to `false`. If **Video default** is set to `true`, the **Video enabled** setting is ignored and participants can turn the camera on or off.

ELEMENT	TYPE	LEVEL	USAGE
<Whiteboard>	Boolean ❷		Controls whiteboard configuration on a Teams Rooms device. This element has two attributes: • **default** Determines on which device the whiteboard will be active when a meeting starts. For the best experience, we recommend that the Teams Rooms device be set to `false` and that you use the whiteboard on a Surface Hub. • **enabled** Determines whether participants in a meeting can toggle the whiteboard on or off. If you don't want participants to turn the whiteboard on or off on a device, set this to `false`. If **Whiteboard default** is set to `true`, the **Whiteboard enabled** setting is ignored and participants can turn the whiteboard on or off.

❶ All of the first-level elements are optional. If a first-level element is omitted, all of its child parameters remain unchanged on the device.

❷ A boolean flag can be: true, false, 0, or 1. Leaving boolean or numeric values empty can render the XML malformed and prevent changes to the settings.

❸ If a string parameter is present and empty, and empty is a valid value, the parameter is cleared on the device.

Manage console settings with an XML configuration file

At startup, if a Microsoft Teams Rooms console finds an XML file named SkypeSettings.xml located at `C:\Users\Skype\AppData\Local\Packages\Microsoft.SkypeRoomSystem_8wekyb3d8bbwe\LocalState`, it applies the configuration settings indicated by the XML file then deletes the XML file.

Depending on how many Microsoft Teams Rooms devices your enterprise has and how you choose to manage to configure them, there are several ways to place the XML configuration file. Once the file is pushed to the console, restart it to process the configuration changes. The XML configuration file is deleted after it is successfully processed. The management methods suggested for Microsoft Teams Rooms devices are discussed in:

- Configuring Group Policy for Microsoft Teams Rooms

- Remote Management using PowerShell and Configure a File Item

You are free to use any method you like so long as you can use it to transfer files and trigger a restart on the console device. The file must be readable, writable, and delete-able by the device's local user account. Preferably it is owned by and has full privileges granted to that user. If the file permissions are not set correctly, the software can fail to apply the settings, can fail to delete the file upon successful processing, and can even potentially crash.

Custom Theme Images

The custom theme image file must be placed in the `C:\Users\Skype\AppData\Local\Packages\Microsoft.SkypeRoomSystem_8wekyb3d8bbwe\LocalState` folder. Enter the file name and extension in the <CustomThemeImageUrl> variable.

The image file should be exactly 3840X1080 pixels and must be one of the following file formats: jpg, jpeg, png, and bmp. If your organization wants a custom image, a graphic designer can use the Custom Theme Photoshop Template. It contains further detail on where various user interface elements are relative to the rest of a theme image and what areas appear on consoles and displays.

The XML configuration file must be updated at device startup to recognize the theme image. Once the new XML file is processed and deleted, the theme graphic file is deleted from the directory.

Locate the Content camera USB instance path

To locate the instance path:

1. Go into Windows settings on the Microsoft Teams Rooms console.
2. Enter the admin password.
3. From a Command Prompt, type `devmgmt.msc` to bring up Device Manager.
4. In **Device Manager**, look in the **Imaging devices** node and locate the content camera.
5. Right-click the camera, and open **Properties**.
6. Select the **Details** tab, and locate the **Device instance path** property in the drop-down.
7. The value shown is the device instance path to set in the XML configuration file. When specifying the path in XML, replace the ampersand (&) with `&`.

See also

Content cameras

Manage Microsoft Teams Rooms

Configure a File Item

Use the Microsoft Teams Rooms recovery tool

7/2/2020 • 2 minutes to read • Edit Online

This article discusses how to use the recovery tool for Microsoft Teams Rooms, which you would use to bring an out of date system into a supported state. This tool should be applied when either the Microsoft Teams Rooms console shows a "system config out of date" error, or prior to performing a push button reset factory restore.

Prerequisites

Download the latest Microsoft Teams Rooms installation package and extract it to a USB memory stick or network share accessible to the Microsoft Teams Rooms device.

> **NOTE**
>
> Extracting the files from the MSI can be accomplished by many means. Any mechanism that extracts all the files and preserves their directory structure is acceptable. One such way is to use the command `msiexec /a PathToMsi /qb TARGETDIR=PathToTarget` where `PathToMsi` represents the full path to the Microsoft Teams Room installation package, and `PathToTarget` represents the full path to the folder you would like the files extracted to.

Running the tool

1. Sign in to the admin account on your Microsoft Teams Rooms device, and launch an elevated command prompt.
2. Verify from the Microsoft Teams Rooms device that you are able to access the `RecoveryTool.ps1 file`, which is included in the files extracted from the Microsoft Teams Rooms installation package. The kit can be found on the network share or USB drive used when preparing prerequisites.
3. Run `powershell.exe -ExecutionPolicy Unrestricted -File "<path to RecoveryTool.ps1>"`.
4. To perform a factory restore:
   a. When prompted by the script select option 2: **Reset**.
   b. If BitLocker is on, follow the instructions provided at the end of the script output to disable it.
   c. Perform the factory restore.
      a. Open the **Settings** app, and select **Update & Security**
      b. Navigate to the **Recovery** tab.
      c. Beneath **Reset this PC**, select **Get started**
      d. Select **Remove everything**, then **Next** and **Reset**

      > **WARNING**
      >
      > The Microsoft Teams Rooms device can become unusable if the **Keep my files - Removes Apps and settings, but keeps your personal files** option is selected during the Windows Reset process. Do not select this option. 5. The system will reboot multiple times. When the reset is complete, the system will be at the Windows "out of box experience" (OOBE) screen.

See also

Microsoft Teams Rooms help

Manage Microsoft Teams Rooms

Manage meeting policies in Teams

12/5/2020 • 26 minutes to read • Edit Online

Meeting policies are used to control the features that are available to meeting participants for meetings that are scheduled by users in your organization. You can use the global (Org-wide default) policy that's automatically created or create and assign custom policies. You manage meeting policies in the Microsoft Teams admin center or by using PowerShell.

> **NOTE**
> For information about using roles to manage the permissions of meeting presenters and attendees, see Roles in a Teams meeting.

You can implement policies in the following ways, which affect the meeting experience for users before a meeting starts, during a meeting, or after a meeting.

IMPLEMENTATION TYPE	DESCRIPTION
Per-organizer	When you implement a per-organizer policy, all meeting participants inherit the policy of the organizer. For example, **Automatically admit people** is a per-organizer policy and controls whether users join the meeting directly or wait in the lobby for meetings scheduled by the user who is assigned the policy.
Per-user	When you implement a per-user policy, only the per-user policy applies to restrict certain features for the organizer and/or meeting participants. For example, **Allow Meet now in channels** is a per-user policy.
Per-organizer and per-user	When you implement a combination of a per-organizer and per-user policy, certain features are restricted for meeting participants based on their policy and the organizer's policy. For example, **Allow cloud recording** is a per-organizer and per-user policy. Turn on this setting to allow the meeting organizer and participants to start and stop a recording.

You can edit the settings in the global policy or create and assign one or more custom policies. Users will get the global policy unless you create and assign a custom policy.

> **NOTE**
> Meeting details button will be available if a user has the audio conference licenses enabled or the user is allow for audio conferencing, if not, the meeting details will not be available.

Create a custom meeting policy

1. In the left navigation of the Microsoft Teams admin center, go to **Meetings** > **Meeting policies**.
2. Select **Add**.
3. Enter a name and description for the policy. The name can't contain special characters or be longer than 64 characters.

4. Choose the settings that you want.
5. Select **Save**.

For example, say you have a bunch of users and you want to limit the amount of bandwidth that their meeting would require. You would create a new custom policy named "Limited bandwidth" and disable the following settings:

Under **Audio & video**:

- Turn off Allow cloud recording.
- Turn off Allow IP video.

Under **Content sharing**:

- Disable screen sharing mode.
- Turn off Allow whiteboard.
- Turn off Allow shared notes.

Then assign the policy to the users.

Edit a meeting policy

You can edit the global policy and any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Meetings** > **Meeting policies**.
2. Select the policy by clicking to the left of the policy name, and then select **Edit**.
3. From here, make the changes that you want.
4. Select **Save**.

> **NOTE**
> A user can be assigned only one meeting policy at a time.

Assign a meeting policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

> **NOTE**
> You can't delete a policy if users are assigned to it. You must first assign a different policy to all affected users, and then you can delete the original policy.

Meeting policy settings

When you select an existing policy on the **Meeting policies** page or select **Add** to add a new policy, you can configure settings for the following.

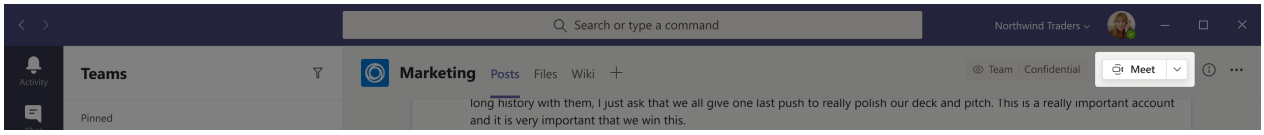
- General
- Audio & video
- Content sharing
- Participants & guests

Meeting policy settings - General

- Allow Meet now in channels
- Allow the Outlook add-in
- Allow channel meeting scheduling
- Allow scheduling private meetings
- Allow Meet now in private meetings

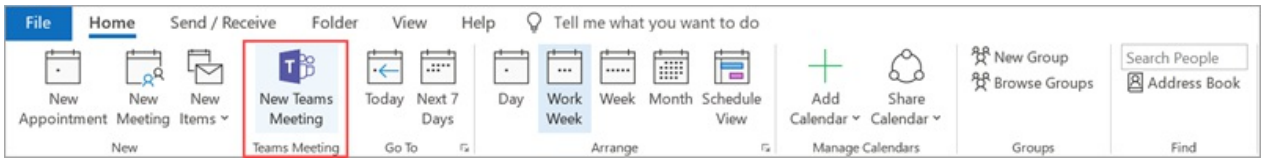
Allow Meet now in channels

Allow **Meet now** is a per-user policy and applies before a meeting starts. This setting controls whether a user can start an unplanned meeting in a Teams channel. If you turn this setting on, users can select the **Meet** button to start an unplanned meeting or schedule a meeting in the channel. The default value is True.



Allow the Outlook add-in

This is a per-user policy and applies before a meeting starts. This setting controls whether Teams meetings can be scheduled from within Outlook (Windows, Mac, web, and mobile).



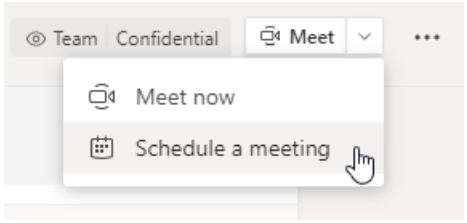
If you turn this off, users are unable to schedule. Teams meetings when they create a new meeting in Outlook. For example, in Outlook on Windows, the **New Teams Meeting** option won't show up in the ribbon.

Allow channel meeting scheduling

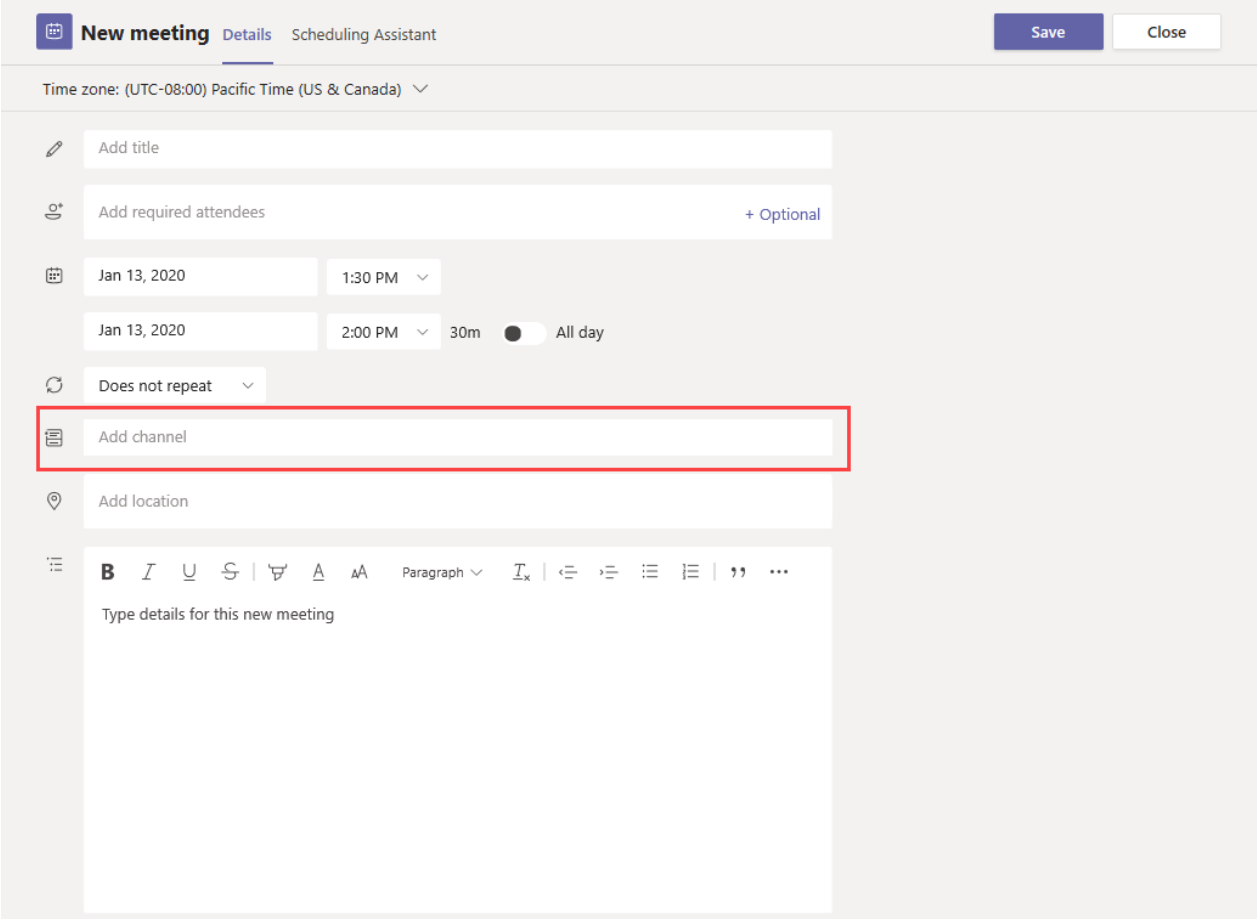
Use the existing AllowChannelMeetingScheduling policy to control the types of events that can be created on the team channel calendars. This is a per-user policy and applies before a meeting starts. This setting controls whether users can schedule a meeting in a Teams channel. By default, this setting is turned on.

If this policy is turned off, users won't be able to create new channel meetings. However, existing channel meetings can be edited by the organizer of the event.

Schedule a meeting will be disabled.

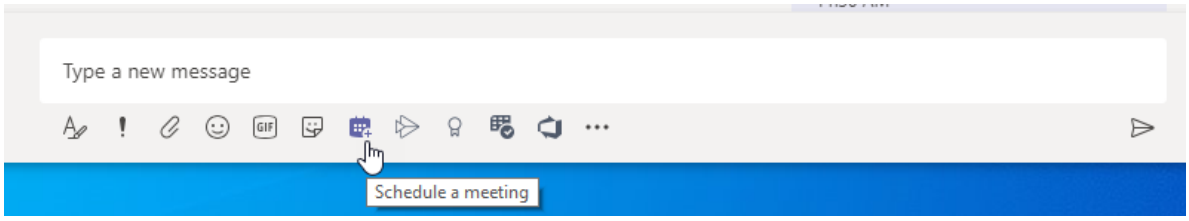


Channel selection is disabled.

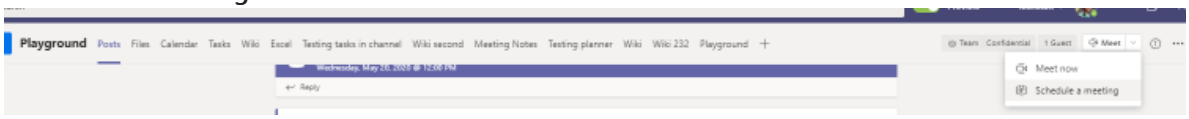


In the channel posts page, the following features will be disabled:

- **Schedule a meeting** button on the channel reply compose box.

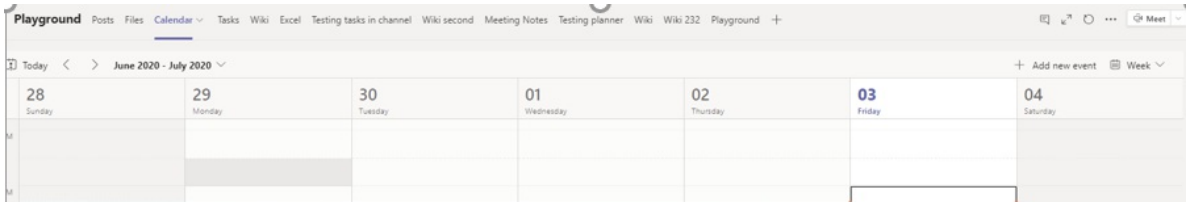


- **Schedule a meeting** button on the channel header.



In the channel calendar:

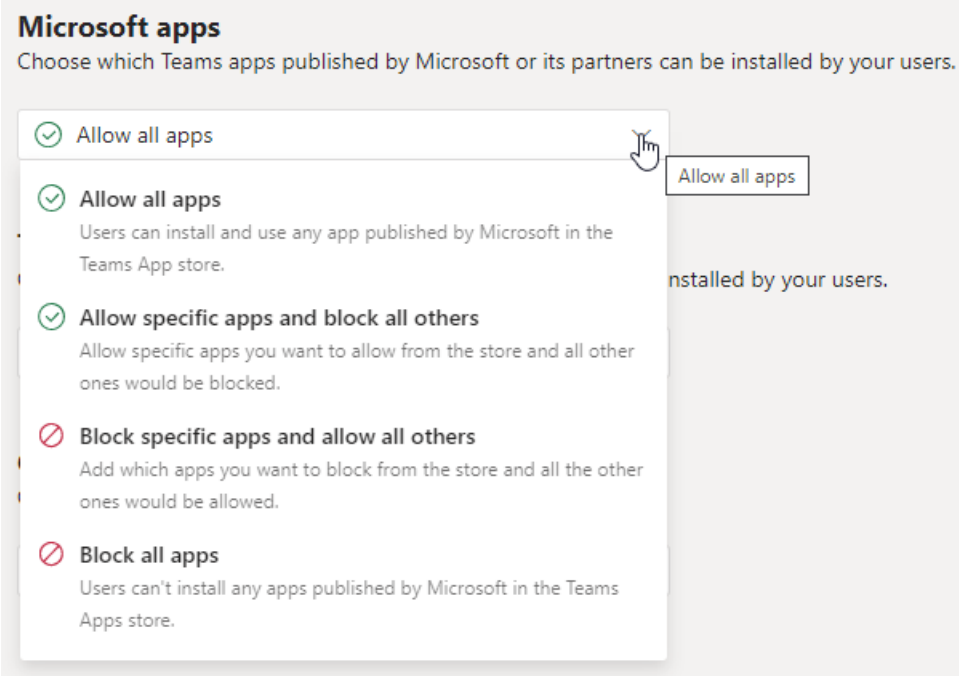
- **Add new event** button on channel calendar header will be disabled.



- Users won't be able to drag and select a time block on the channel calendar to create a channel meeting.
- Users can't use Keyboard shortcuts to create a meeting on the channel calendar.

In the admin center:

The channel calendar app will show up in the **Microsoft apps** section on the app permission policies page.



Allow scheduling private meetings

This is a per-user policy and applies before a meeting starts. This setting controls whether users can schedule private meetings in Teams. A meeting is private when it's not published to a channel in a team.

Note that if you turn off **Allow scheduling private meetings** and **Allow channel meeting scheduling**, the **Add required attendees** and **Add channel** options are disabled for users in Teams. By default, this setting is turned on.

Allow Meet now in private meetings

This is a per-user policy and applies before a meeting starts. This setting controls whether a user can start an unplanned private meeting. By default, this setting is turned on.

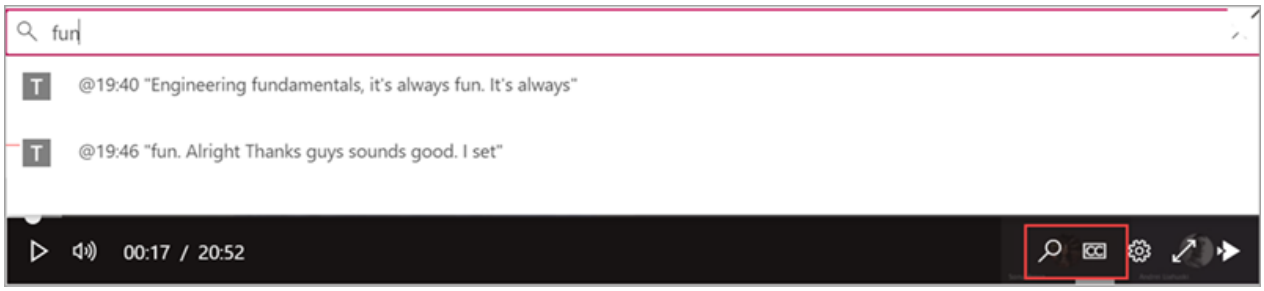
Meeting policy settings - Audio & video

- Allow transcription
- Allow cloud recording
- Mode for IP audio
- Mode for IP video
- Allow IP video
- Media bit rate (Kbs)

Allow transcription

This is a combination of a per-organizer and per-user policy. This setting controls whether captions and transcription features are available during playback of meeting recordings. If you turn this off, the **Search** and **CC** options won't be available during playback of a meeting recording. The person who started the recording needs this setting turned on so that the recording also includes transcription.

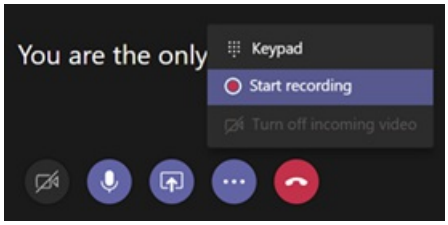
Note that transcription for recorded meetings is currently only supported for users who have the language in Teams set to English and when English is spoken in the meeting.



Allow cloud recording

This is a combination of a per-organizer and per-user policy. This setting controls whether this user's meetings can be recorded. The recording can be started by the meeting organizer or by another meeting participant if the policy setting is turned on for the participant and if they're an authenticated user from the same organization.

People outside your organization, such as federated and anonymous users, can't start the recording. Guest users can't start or stop the recording.



Let's look at the following example.

USER	MEETING POLICY	ALLOW CLOUD RECORDING
Daniela	Global	Off
Amanda	Location1MeetingPolicy	On
John (external user)	Not applicable	Not applicable

Meetings organized by Daniela can't be recorded and Amanda, who has the policy setting enabled, can't record meetings organized by Daniela. Meetings organized by Amanda can be recorded, however, Daniela, who has the policy setting disabled and John who is an external user, can't record meetings organized by Amanda.

To learn more about cloud meeting recording, see Teams cloud meeting recording.

Mode for IP audio

This is a per-user policy. This setting controls whether audio can be turned on in meetings and group calls. Here are the values for this setting.

SETTING VALUE	BEHAVIOR
Outgoing and incoming audio enabled	Outgoing and incoming audio is allowed in the meeting. This is the default setting.
Disabled	Outgoing and incoming audio is turned off in the meeting.

If set to **Disabled** for a user, that user can still schedule and organize meetings but they can't use audio. To join a meeting, they have to dial in through the Public Switched Telephone Network (PSTN) or have the meeting call and join them by phone. Meeting participants who don't have any policies assigned (for example, anonymous participants) have this set to **Outgoing and incoming audio enabled** by default. On Teams mobile clients, if this setting is disabled, the user has to dial in to the meeting through the PSTN.

This setting doesn't apply to 1:1 calls. To restrict 1:1 calls, configure a Teams calling policy and turn off the **Make private calls** setting. This setting also doesn't apply to conference room devices such as Surface Hub and Microsoft Teams Rooms devices.

This setting isn't yet available for Microsoft 365 Government Community Cloud (GCC), GCC High, or Department of Defense (DoD) environments.

To learn more, see Manage audio/video for meeting participants.

Mode for IP video

This is a per-user policy. This setting controls whether video can be turned on in meetings and group calls. Here are the values for this setting.

SETTING VALUE	BEHAVIOR
Outgoing and incoming video enabled	Outgoing and incoming video is allowed in the meeting. This is the default setting.
Disabled	Outgoing and incoming video is turned off in the meeting. On Teams mobile clients, users can't share videos or photos in the meeting. Note that if **Mode for IP audio** is disabled, then **Mode for IP video** will also remain disabled.

If set to **Disabled** for a user, that user can't turn on video or view videos shared by other meeting participants. Meeting participants who don't have any policies assigned (for example, anonymous participants) have this set to **Outgoing and incoming video enabled** by default.

This setting doesn't apply to conference room devices such as Surface Hub and Microsoft Teams Rooms devices.

This setting isn't yet available for Microsoft 365 Government Community Cloud (GCC), GCC High, or Department of Defense (DoD) environments.

> **NOTE**
> Keep in mind that this setting controls both outgoing and incoming video whereas the **Allow IP video** setting controls outgoing video. To learn more, see Which IP video policy setting takes precedence? and Manage audio/video for meeting participants.

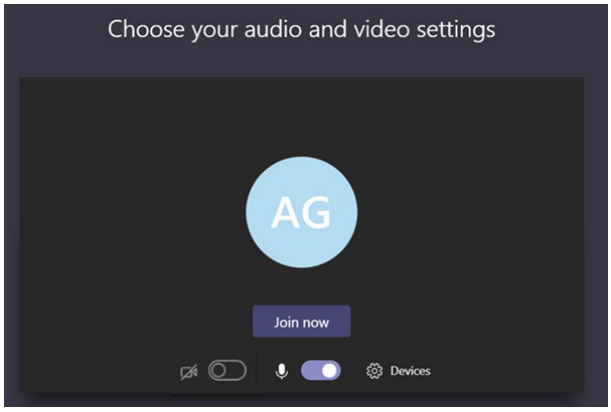
To learn more, see Manage audio/video for meeting participants.

Allow IP video

This is a combination of a per-organizer and per-user policy. Video is a key component to meetings. In some organizations, admins might want more control over which users' meetings have video. This setting controls whether video can be turned on in meetings hosted by a user and in 1:1 and group calls started by a user. On Teams mobile clients, this setting control whether users can share photos and videos in a meeting.

Meetings organized by a user who has this policy setting enabled, allow video sharing in the meeting by the meeting participants, if the participants also have the policy setting enabled. Meeting participants who don't have any policies assigned (for example, anonymous and federated participants) inherit the policy of the meeting organizer.

> **NOTE**
>
> Keep in mind that this setting controls outgoing video whereas the **Mode for IP video** setting controls both outgoing and incoming video. To learn more, see Which IP video policy setting takes precedence? and Manage audio/video for meeting participants.

TEAMS DESKTOP AND WEB CLIENT	TEAMS MOBILE CLIENT
	

Let's look at the following example.

USER	MEETING POLICY	ALLOW IP VIDEO
Daniela	Global	On
Amanda	Location1MeetingPolicy	Off

Meetings hosted by Daniela allow video to be turned on. Daniela can join the meeting and turn on video. Amanda can't turn on video in Daniela's meeting because Amanda's policy is set to not allow video. Amanda can see videos shared by other participants in the meeting.

In meetings hosted by Amanda, no one can turn on video, regardless of the video policy assigned to them. This means Daniela can't turn on video in Amanda's meetings.

If Daniela calls Amanda with video on, Amanda can answer the call with audio only. When the call is connected, Amanda can see Daniela's video, but can't turn on video. If Amanda calls Daniela, Daniela can answer the call with video and audio. When the call is connected, Daniela can turn on or turn off her video, as needed.

To learn more, see Manage audio/video for meeting participants.

Which IP video policy setting takes precedence

For a user, the most restrictive policy setting for video takes precedence. Here's some examples.

ALLOW IP VIDEO	MODE FOR IP VIDEO	MEETING EXPERIENCE
Organizer: **On** Participant: **On**	Participant: **Disabled**	The **Mode for IP video** setting takes precedence. The participant who is assigned this policy can't turn on or view videos shared by others.
Organizer: **On** Participant: **On**	Participant: **Outgoing and incoming video enabled**	The participant who is assigned this policy can turn on or view videos shared by others.
Organizer: **On** Participant: **Off**	Participant: **Outgoing and incoming video enabled**	The **Allow IP video** setting takes precedence. Participants can only see incoming video and can't send outgoing video.
Organizer: **On** Participant: **Off**	Participant: **Disabled**	The **Mode for IP video** setting takes precedence. The participant can't see incoming or outgoing video.
Organizer: **Off**		The **Allow IP video** setting takes precedence because it's turned off for the organizer. No one can turn on video in meetings organized by the user who is assigned this policy.

Manage audio/video for meeting participants

IF YOU WANT TO...	SET THE FOLLOWING POLICY SETTINGS
Disable audio and video for participants in meetings	Mode for IP audio: **Disabled** Mode for IP video: **Disabled** Allow IP video: N/A
Enable only incoming video and audio for participants in meetings	Mode for IP audio: **Outgoing and incoming audio enabled** Mode for IP video: **Outgoing and incoming video enabled** Allow IP video: **Off**
Disable video for participants in meetings (participants have audio only)	Mode for IP audio: **Enable outgoing and incoming audio** Mode for IP video: **Disabled** Allow IP video: N/A
Enable audio and video for participants in meetings	Mode for IP audio: **Outgoing and incoming audio enabled** (default) Mode for IP video: **Outgoing and incoming video enabled** (default) Allow IP video: **On** (default)

The most restrictive policy between the meeting organizer's policy and the user's policy applies. For example, if an organizer has a policy that restricts video and a user's policy doesn't restrict video, meeting participants inherit the policy of the meeting organizer and don't have access to video in meetings. This means that they can join the meeting with audio only.

> **NOTE**
>
> When a user starts a group call to join by phone, the **Use phone for audio** screen doesn't appear. This is a known issue that we're working to resolve. To work around this issue, select **Phone audio** under **Other join options**.

Teams mobile clients

For users on Teams mobile clients, the ability to share photos and videos during a meeting is also determined by the **Allow IP video** or **IP video mode** setting. Depending on which policy setting takes precedence, the ability to share videos and photos won't be available. This doesn't affect screen sharing, which you configure using a separate Screen sharing mode setting. Additionally, you can set a Teams mobility policy to prevent mobile users from using IP video over a cellular connection, which means they must use a WiFi connection.

Media bit rate (Kbs)

This is a per-user policy. This setting determines the media bit rate for audio, video, and video-based app sharing transmissions in calls and meetings for the user. It's applied to both the uplink and downlink media traversal for users in the call or meeting. This setting gives you granular control over managing bandwidth in your organization. Depending on the meetings scenarios required by users, we recommend having enough bandwidth in place for a good quality experience. The minimum value is 30 Kbps and the maximum value depends on the meeting scenario. To learn more about the minimum recommended bandwidth for good quality meetings, calls, and live events in Teams, see Bandwidth requirements.

If there isn't enough bandwidth for a meeting, participants see a message that indicates poor network quality.

For meetings that need the highest-quality video experience, such as CEO board meetings and Teams live events, we recommend you set the bandwidth to 10 Mbps. Even when the maximum experience is set, the Teams media stack adapts to low-bandwidth conditions when certain network conditions are detected, depending on the scenario.

Meeting policy settings - Content sharing

- Screen sharing mode
- Allow a participant to give or request control
- Allow an external participant to give or request control
- Allow PowerPoint sharing
- Allow whiteboard
- Allow shared notes

Screen sharing mode

> **NOTE**
>
> This feature is still in development. Screen sharing is a per-participant policy.

This setting controls whether desktop and/or window sharing is allowed in the user's meeting. Meeting participants who don't have any policies assigned (for example, anonymous, guest, B2B, and federated participants) inherit the policy of the meeting organizer.

SETTING VALUE	BEHAVIOR
Entire screen	Full desktop sharing and application sharing are allowed in the meeting
Single application	Application sharing is allowed in the meeting

SETTING VALUE	BEHAVIOR
Disabled	Screen sharing and application sharing turned off in the meeting.

Let's look at the following example.

USER	MEETING POLICY	SCREEN SHARING MODE
Daniela	Global	Entire screen
Amanda	Location1MeetingPolicy	Disabled

Meetings hosted by Daniela allow meeting participants to share their entire screen or a specific application. If Amanda joins Daniela's meeting, Amanda can't share her screen or a specific application as her policy setting is disabled. In meetings hosted by Amanda, no one is allowed to share their screen or a single application, regardless of the screen sharing mode policy assigned to them. This means that Daniela can't share her screen or a single application in Amanda's meetings.

Currently, users can't play video or share their screen in a Teams meeting if they're using Google Chrome.

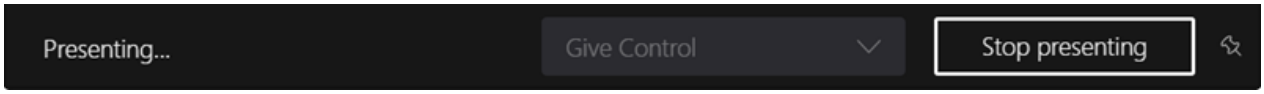
Allow a participant to give or request control

This is a per-user policy. This setting controls whether the user can give control of the shared desktop or window to other meeting participants. To give control, hover over the top of the screen.

If this setting is turned on for the user, the **Give Control** option is displayed in the top bar in a sharing session.



If the settings is turned off for the user, the **Give Control** option isn't available.



Let's look at the following example.

USER	MEETING POLICY	ALLOW PARTICIPANT TO GIVE OR REQUEST CONTROL
Daniela	Global	On
Babek	Location1MeetingPolicy	Off

Daniela can give control of the shared desktop or window to other participants in a meeting organized by Babek whereas Babek can't give control to other participants.

To use PowerShell to control who can give control or accept requests for control, use the AllowParticipantGiveRequestControl cmdlet.

> **NOTE**
> To give and take control of shared content during sharing, both parties must be using the Teams desktop client. Control isn't supported when either party is running Teams in a browser. This is due to a technical limitation that we're planning to fix.

Allow an external participant to give or request control

This is a per-user policy. Whether an organization has this set for a user doesn't control what external participants can do, regardless of what the meeting organizer has set. This parameter controls whether external participants can be given control or request control of the sharer's screen, depending on what the sharer has set within their organization's meeting policies. External participants in Teams meetings can be categorized as follows:

- Anonymous user
- Guest users
- B2B user
- Federated user

Whether federated users can give control to external users while sharing is controlled by the **Allow an external participant to give or request control** setting in their organization.

To use PowerShell to control whether external participants can give control or accept requests for control, use the AllowExternalParticipantGiveRequestControl cmdlet.

Allow PowerPoint sharing

This is a per-user policy. This setting controls whether the user can share PowerPoint slide decks in a meeting. External users, including anonymous, guest, and federated users, inherit the policy of the meeting organizer.

Let's look at the following example.

USER	MEETING POLICY	ALLOW POWERPOINT SHARING
Daniela	Global	On
Amanda	Location1MeetingPolicy	Off

Amanda can't share PowerPoint slide decks in meetings even if she's the meeting organizer. Daniela can share PowerPoint slide decks even if the meeting is organized by Amanda. Amanda can view the PowerPoint slide decks shared by others in the meeting, even though she can't share PowerPoint slide decks.

Allow whiteboard

This is a per-user policy. This setting controls whether a user can share the whiteboard in a meeting. External users, including anonymous, B2B, and federated users, inherit the policy of the meeting organizer.

Let's look at the following example.

USER	MEETING POLICY	ALLOW WHITEBOARD
Daniela	Global	On
Amanda	Location1MeetingPolicy	Off

Amanda can't share the whiteboard in a meeting even if she's the meeting organizer. Daniela can share the whiteboard even if a meeting is organized by Amanda.

Allow shared notes

This is a per-user policy. This setting controls whether a user can create and share notes in a meeting. External users, including anonymous, B2B, and federated users, inherit the policy of the meeting organizer. The **Meeting Notes** tab is currently only supported in meetings that have fewer than 20 participants.

Let's look at the following example.

USER	MEETING POLICY	ALLOW SHARED NOTES
Daniela	Global	On
Amanda	Location1MeetingPolicy	Off

Daniela can take notes in Amanda's meetings and Amanda can't take notes in any meetings.

Meeting policy settings - Participants & guests

These settings control which meeting participants wait in the lobby before they are admitted to the meeting and the level of participation they are allowed in a meeting.

- Let anonymous people start a meeting
- Automatically admit people
- Allow dial-in users to bypass the lobby
- Enable live captions
- Allow chat in meetings

> **NOTE**
> Options to join a meeting will vary, depending on the settings for each Teams group, and the connection method. If your group has audio conferencing, and uses it to connect, see Audio Conferencing. If your Teams group doesn't have audio conferencing, refer to Join a meeting in Teams.

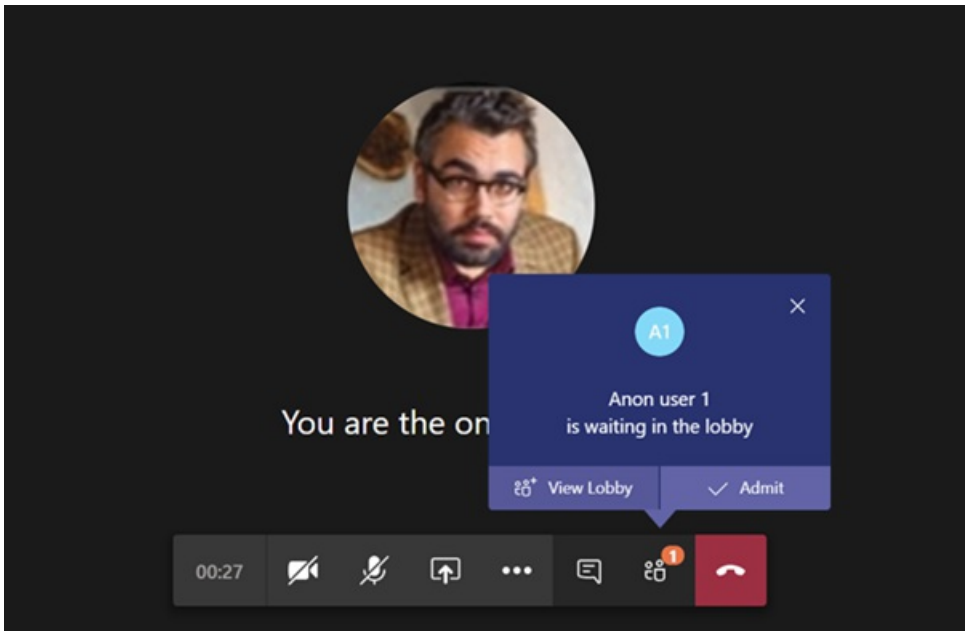
Let anonymous people start a meeting

This is a per-organizer policy that allows for leaderless dial-in conferencing meetings. This setting controls whether dial-in users can join the meeting without an authenticated user from the organization in attendance. By default, this setting is turned off which means dial-in users will wait in the lobby until an authenticated user from the organization joins the meeting.

> **NOTE**
> If this setting is turned off and a dial-in user joins the meeting first and is placed in the lobby, an organization user must join the meeting with a Teams client to admit the user from the lobby. There are no lobby controls available for dialed in users.

Automatically admit people

This is a per-organizer policy. This setting controls whether people join a meeting directly or wait in the lobby until they are admitted by an authenticated user. This setting does not apply to dial-in users.



Meeting organizers can click **Meeting Options** in the meeting invitation to change this setting for each meeting they schedule.

> **NOTE**
> In the meeting options the setting is labeled "Who can bypass the lobby". If you change the default setting for any user, it will apply to all new meetings organized by that user and any prior meetings where the user didn't modify Meeting options.

SETTING VALUE	JOIN BEHAVIOR
Everyone	All meeting participants join the meeting directly without waiting in the lobby. This includes authenticated users, external users from trusted organizations (federated), guests, and anonymous users.
Everyone in your organization and federated organizations	Authenticated users within the organization, including guest users and the users from trusted organizations, join the meeting directly without waiting in the lobby. Anonymous users wait in the lobby.
Everyone in your organization	Authenticated users from within the organization, including guest users, join the meeting directly without waiting in the lobby. Users from trusted organizations and anonymous users wait in the lobby. This is the default setting.
Organizer only	Only meeting organizers can join the meeting directly without waiting in the lobby. Everyone else, including authenticated users within the organization, guest users, users from trusted organizations and anonymous users must wait in the lobby.

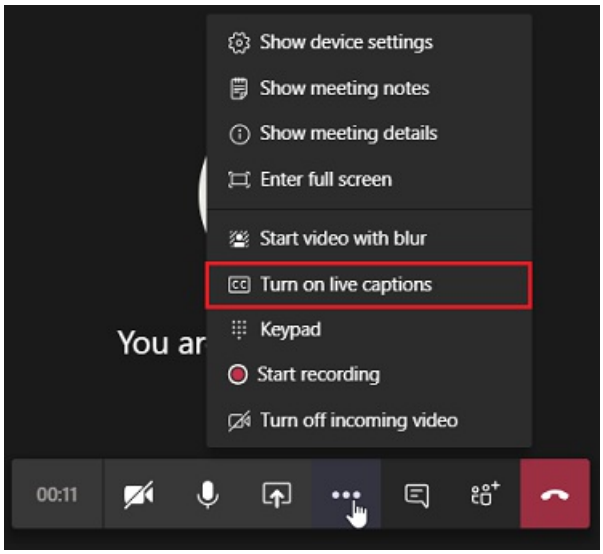
Allow dial-in users to bypass the lobby

This is a per-organizer policy. This setting controls whether people who dial in by phone join the meeting directly or wait in the lobby regardless of the **Automatically admit people** setting. By default, this setting is turned off. When this setting is turned off, dial-in users will wait in the lobby until a organization user joins the meeting with a Teams client and admits them. When this setting is turned on, dial-in users will automatically join the meeting when an organization user joins the meeting.

> **NOTE**
> If a dial-in user joins a meeting before an organization user joins the meeting, they will be placed in the lobby until an organization user joins the meeting using a Teams client and admits them. If you change the default setting for any user, it will apply to all new meetings organized by that user and any prior meetings where the user didn't modify Meeting options.

Enable live captions

This is a per-user policy and applies during a meeting. This setting controls whether the **Turn on live captions** option is available for the user to turn on and turn off live captions in meetings that the user attends.



SETTING VALUE	BEHAVIOR
Disabled but the user can override	Live captions aren't automatically turned on for the user during a meeting. The user sees the **Turn on live captions** option in the overflow (...) menu to turn them on. This is the default setting.
Disabled	Live captions are disabled for the user during a meeting. The user doesn't have the option to turn them on.

Allow chat in meetings

This is a per-participant setting. This setting controls whether meeting chat is allowed in the user's meeting.

Meeting policy settings - Designated presenter role mode

This is a per-user policy. This setting lets you change the default value of the **Who can present?** setting in **Meeting options** in the Teams client. This policy setting affects all meetings, including Meet Now meetings.

The **Who can present?** setting lets meeting organizers choose who can be presenters in a meeting. To learn more, see Change participant settings for a Teams meeting and Roles in a Teams meeting.

Currently, you can only use PowerShell to configure this policy setting. You can edit an existing Teams meeting policy by using the Set-CsTeamsMeetingPolicy cmdlet. Or, create a new Teams meeting policy by using the New-CsTeamsMeetingPolicy cmdlet and assign it to users.

To specify the default value of the **Who can present?** setting in Teams, set the **DesignatedPresenterRoleMode** parameter to one of the following:

- **EveryoneUserOverride**: All meeting participants can be presenters. This is the default value. This parameter corresponds to the **Everyone** setting in Teams.

- **EveryoneInCompanyUserOverride**: Authenticated users in the organization, including guest users, can be presenters. This parameter corresponds to the **People in my organization** setting in Teams.
- **OrganizerOnlyUserOverride**: Only the meeting organizer can be a presenter and all meeting participants are designated as attendees. This parameter corresponds to the **Only me** setting in Teams.

Keep in mind that after you set the default value, meeting organizers can still change this setting in Teams and choose who can present in the meetings that they schedule.

Meeting policy settings - Meeting attendance report

This is a per-user policy. This setting controls whether meeting organizers can download the meeting attendance report.

Currently, you can only use PowerShell to configure this policy setting. You can edit an existing Teams meeting policy by using the Set-CsTeamsMeetingPolicy cmdlet. Or, create a new Teams meeting policy by using the New-CsTeamsMeetingPolicy cmdlet and assign it to users.

To enable a meeting organizer to download the meeting attendance report, set the **AllowEngagementReport** parameter to **Enabled**. When enabled, the option to download the report is displayed in the **Participants** pane.

To prevent a meeting organizer from downloading the report, set the parameter to **Disabled**. By default, this setting is disabled and the option to download the report isn't available.

Meeting policy settings - Meeting provider for Islands mode

This is a per-user policy. This setting controls which Outlook meeting add-in is used for *users who are in Islands mode*. You can specify whether users can only use the Teams Meeting add-in or both the Teams Meeting and Skype for Business Meeting add-ins to schedule meetings in Outlook.

You can only apply this policy to users who are in Islands mode and have the **AllowOutlookAddIn** parameter set to **True** in their Teams meeting policy.

Currently, you can only use PowerShell to set this policy. You can edit an existing Teams meeting policy by using the Set-CsTeamsMeetingPolicy cmdlet. Or, create a new Teams meeting policy by using the New-CsTeamsMeetingPolicy cmdlet and assign it to users.

To specify which meeting add-in you want to be available to users, set the **PreferredMeetingProviderForIslandsMode** parameter as follows:

- Set the parameter to **TeamsAndSfB** to enable both the Teams Meeting add-in and Skype for Business add-in in Outlook. This is the default value.
- Set the parameter to **Teams** to enable only the Teams Meeting add-in in Outlook. This policy setting ensures that all future meetings have a Teams meeting join link. It doesn't migrate existing Skype for Business meeting join links to Teams. This policy setting doesn't affect presence, chat, PSTN calling, or any other capabilities in Skype for Business, which means that users will continue to use Skype for Business for these capabilities.

  If you set the parameter to **Teams**, and then switch back to **TeamsAndSfB**, both meeting add-ins are enabled. However, note that existing Teams meeting join links won't be migrated to Skype for Business. Only Skype for Business meetings scheduled after the change will have a Skype for Business meeting join link.

Meeting policy settings - Video filters mode

This is a per-user policy. This setting controls whether users can customize their video background in a meeting.

Currently, you can only use PowerShell to set this policy. You can edit an existing Teams meeting policy by using the Set-CsTeamsMeetingPolicy cmdlet. Or, create a new Teams meeting policy by using the New-CsTeamsMeetingPolicy cmdlet, and then assign the policy to users.

To specify whether users can customize their video background in a meeting, set the **VideoFiltersMode** parameter as follows:

SETTING VALUE IN POWERSHELL	BEHAVIOR
NoFilters	User can't customize their video background.
BlurOnly	User has the option to blur their video background.
BlurandDefaultBackgrounds	User has the option to blur their video background or choose from the default set of images to use as their background.
AllFilters	Use has the option to blur their video background, choose from the default set of images, or upload custom images to use as their background.

> **NOTE**
> Images uploaded by users aren't screened by Teams. When you use the **AllFilters** setting, you should have internal organization policies to prevent users from uploading offensive or inappropriate images, or images your organization don't have rights to use for Teams meeting backgrounds.

Related topics

- Teams PowerShell overview
- Assign policies to your users in Teams
- Remove the RestrictedAnonymousAccess Teams meeting policy from users

Remove the RestrictedAnonymousAccess Teams meeting policy from users

8/11/2020 • 2 minutes to read • Edit Online

Meeting policies in Microsoft Teams are used to control the features that are available to meeting participants for meetings that are scheduled by users in your organization.

Teams includes a built-in policy named RestrictedAnonymousAccess, which contains pre-defined settings that include restricting anonymous users from starting a meeting. (Anonymous users are users who haven't been authenticated.) The predefined settings in the meeting policy can't be edited or changed by admins.

This article shows you how to use PowerShell to remove the RestrictedAnonymousAccess meeting policy from users who are assigned this policy. To learn more about how to manage Teams using PowerShell, see Teams PowerShell overview.

Before you start

Install and connect to the Skype for Business PowerShell module. For step-by-step guidance, see Install Microsoft Teams PowerShell.

Get the Teams meeting policy assignments for your organization

Run the following to get the Teams meeting policy assignments for your organization.

```
Get-CsOnlineUser | Select-Object objectid, TeamsMeetingPolicy | Group-Object TeamsMeetingPolicy
```

In this example, the following output is returned, which shows that two users are assigned the RestrictedAnonymousAccess meeting policy.

```
Count  Name                                Group
------ ----------                          ---------
233    Education_HigherEducationStudent    {@{ObjectId=755e0d21-0737-4219-b68a-23423497f61f;
TeamsMeetingPolicy=Education_HigherEducationStudent...
20                                         {@{ObjectId=e27fdfb5-bb38-4032-bb33-8e8bdf086eff;
TeamsMeetingPolicy=}, @{ObjectId=91c330...
2      RestrictedAnonymousAccess           {@{ObjectId=38b35ebf-cc8b-4b61-a2db-f6e67c3f614b;
TeamsMeetingPolicy=RestrictedAnonymousAccess...
```

Unassign the RestrictedAnonymous meeting policy from users

To remove the the RestrictedAnonymous meeting policy from users, you can use the Grant-CSTeamsMeetingPolicy cmdlet if you have a small number of users (for example, less than 100 users). If you have a large number of users (for example, more than 100 users), it's more efficient to use the New-CsBatchPolicyAssignmentOperation cmdlet to submit a batch operation.

Use the Grant-CsTeamsMeeting Policy cmdlet

Run the following to remove the RestrictedAnonymous meeting policy from users.

```
Get-CsOnlineUser |? TeamsMeetingPolicy -eq "RestrictedAnonymousAccess" | Select-Object objectid | foreach
{Grant-CsTeamsMeetingPolicy -Identity $_.ObjectId -PolicyName $null}
```

Use the New-CsBatchPolicyAssignmentOperation cmdlet

With batch policy assignment, the maximum number of users for which you can remove or update policies is 5,000 at a time. For example, if you have more than 5,000 users, you'll need to submit multiple batches. For best results, do not submit multiple batches at a time. Allow batches to complete processing before submitting more batches.

> **NOTE**
>
> The New-CsBatchPolicyAssignmentOperation cmdlet is in the Teams PowerShell module. Before you follow these steps, install and connect to the Teams PowerShell module. For step-by-step guidance, see Install Microsoft Teams PowerShell.

Run the following commands to remove the RestrictedAnonymousAccess meeting policy from a batch of users.

```
$restrictedAnonymousUsers = @(Get-CsOnlineUser |? TeamsMeetingPolicy -eq "RestrictedAnonymousAccess" | %{
$_.ObjectId })
```

```
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsMeetingPolicy -PolicyName $null -Identity
$restrictedAnonymousUsers -OperationName "Batch unassign meeting policy"
```

Get the status of the batch assignment

Each batch assignment returns an operation ID, which you can use to track the progress and status of the assignments and identify any failures that might occur. For example, run the following:

```
Get-CsBatchPolicyAssignmentOperation -OperationId 62557b78-e734-42d6-952f-41a454ed6115
```

Make sure the **ErrorCount** is **0** (zero) and **OverallStatus** is **Completed**.

Related topics

- Manage meeting policies in Teams
- Teams PowerShell overview
- Assign policies to your users in Teams

Manage meeting settings in Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

As an admin, you use Teams meetings settings to control whether anonymous users can join Teams meetings, customize meeting invitations, and if you want to enable Quality of Service (QoS), set port ranges for real-time traffic. These settings apply to all Teams meetings that users schedule in your organization. You manage these settings from **Meetings** > **Meeting settings** in the Microsoft Teams admin center.

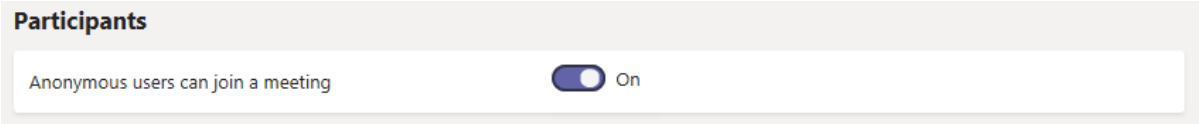
Allow anonymous users to join meetings

With anonymous join, anyone can join the meeting as an anonymous user by clicking the link in the meeting invitation. To learn more, see Join a meeting without a Teams account.

Using the Microsoft Teams admin center

You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

1. Go to the admin center.
2. In the left navigation, go to **Meetings** > **Meeting settings**.
3. Under **Participants**, turn on **Anonymous users can join a meeting**.



Caution

If you don't want anonymous users to join meetings scheduled by users in your organization, turn off this setting.

Customize meeting invitations

You can customize Teams meeting invitations to meet your organization's needs. You can add your organization's logo and include helpful information, such as links to your support website and legal disclaimer, and a text-only footer.

Tips for creating a logo for meeting invitations

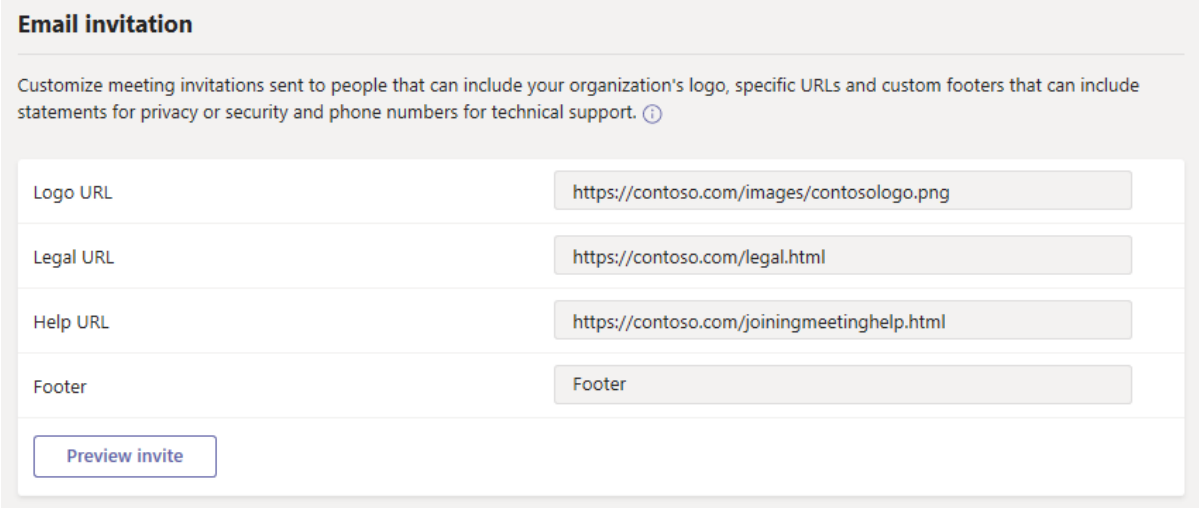
1. Create an image that's no more than 188 pixels wide by 30 pixels tall (it's quite small).
2. Save the image in JPG or PNG format.
3. Store the image in a location that everyone receiving the invitation can access, such as a public website.

   Now you can add it to your meeting invitations. See the next steps.

Customize your meeting invitations

Using the Microsoft Teams admin center

1. Go to the admin center.
2. In the left navigation, go to **Meetings** > **Meeting settings**.
3. Under **Email invitation**, do the following:



- **Logo URL** Enter the URL where your logo is stored.
- **Legal URL** If your organization has a legal website that you want people to go to for any legal concerns, enter the URL here.
- **Help URL** If your organization has a support website that you want people to go to if they run into issues, enter the URL here.
- **Footer** Enter text that you want to include as a footer.

4. Click **Preview invite** to see a preview of your meeting invitation.
5. When you're done, click **Save**.
6. Wait an hour or so for the changes to propagate. Then schedule a Teams meeting to see what the meeting invitation looks like.

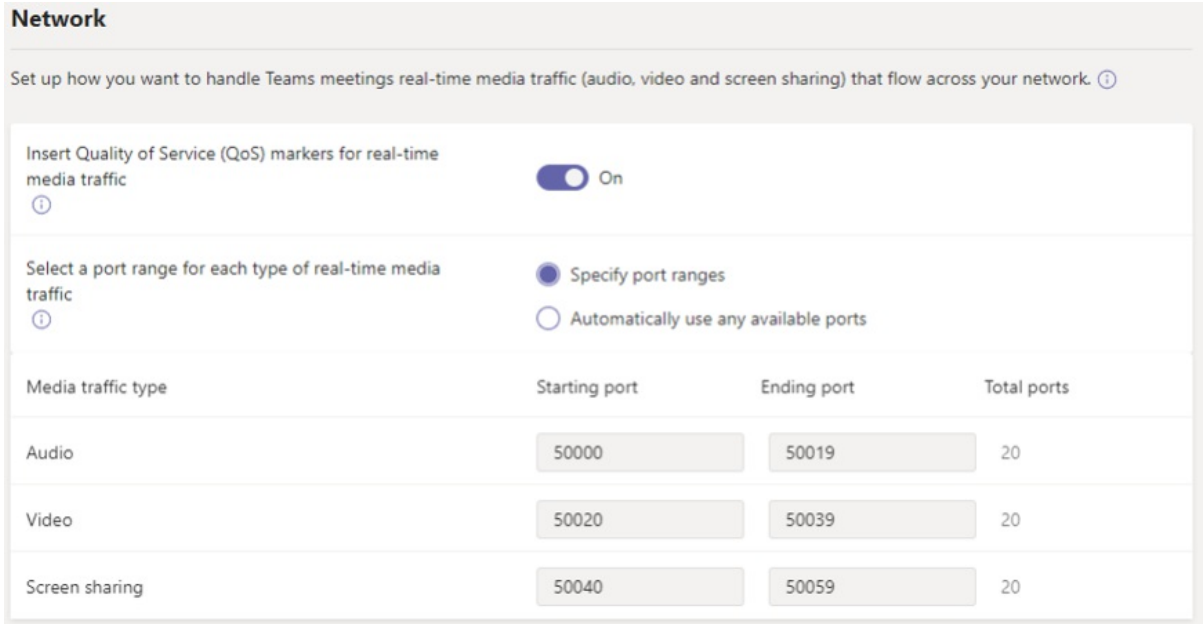
Set how you want to handle real-time media traffic for Teams meetings

If you're using Quality of Service (QoS)to prioritize network traffic, you can enable QoS markers and set port ranges for each type of media traffic. Setting port ranges for different traffic types is only one step in handling real-time media; see Quality of Service (QoS) in Teams for much more detail.

> **IMPORTANT**
> If you enable QoS or change settings in the Microsoft Teams admin center for the Teams service, you'll also need to apply matching settings to all user devices and all internal network devices to fully implement the changes to QoS in Teams.

Using the Microsoft Teams admin center

1. Go to the admin center.
2. In the left navigation, go to **Meetings** > **Meeting settings**.
3. Under **Network**, do the following:



- To allow DSCP markings to be used for QoS, turn on **Insert Quality of Service (QoS) markers for real-time media traffic**. You only have the option of using markers or not; you can't set custom markers for each traffic type. See Select a QoS implementation method for more on DSCP markers.

  > **NOTE**
  > DSCP tagging is typically done via Source Ports and UDP traffic will route to Transport Relay with destination port of 3478 by default. If your company requires tagging on destination ports, please contact support to enable communication to the Transport Relay with UDP ports 3479 (Audio), 3480 (Video), and 3481 (Sharing).

- To specify port ranges, next to **Select a port range for each type of real-time media traffic**, select **Specify port ranges**, and then enter the starting and ending ports for audio, video, and screen sharing. Selecting this option is required to implement QoS.

  > **NOTE**
  > If **Quality of Service (QoS) markers for real-time media traffic** is on, then you have to manage your port settings. They aren't managed automatically.

  > **IMPORTANT**
  > If you select **Automatically use any available ports**, available ports between 1024 and 65535 are used. Use this option only when not implementing QoS.
  >
  > Selecting a port range that is too narrow will lead to dropped calls and poor call quality. The recommendations below should be a bare minimum.

If you're unsure what port ranges to use in your environment, the following settings are a good starting point. To learn more, read Implement Quality of Service (QoS) in Microsoft Teams. These are the required DSCP markings and the suggested corresponding media port ranges used by both Teams and ExpressRoute.

Port ranges and DSCP markings

MEDIA TRAFFIC TYPE	CLIENT SOURCE PORT RANGE *	PROTOCOL	DSCP VALUE	DSCP CLASS
Audio	50,000–50,019	TCP/UDP	46	Expedited Forwarding (EF)
Video	50,020–50,039	TCP/UDP	34	Assured Forwarding (AF41)
Application/Screen Sharing	50,040–50,059	TCP/UDP	18	Assured Forwarding (AF21)

* The port ranges you assign can't overlap and should be adjacent to each other.

After QoS has been in use for a while, you'll have usage information on the demand for each of these three workloads, and you can choose what changes to make based on your specific needs. Call Quality Dashboard will be helpful with that.

Emails sent to users when their settings change in Microsoft Teams

8/17/2020 • 3 minutes to read • Edit Online

Emails will be automatically sent to users who are enabled for Audio Conferencing using Microsoft as the audio conferencing provider.

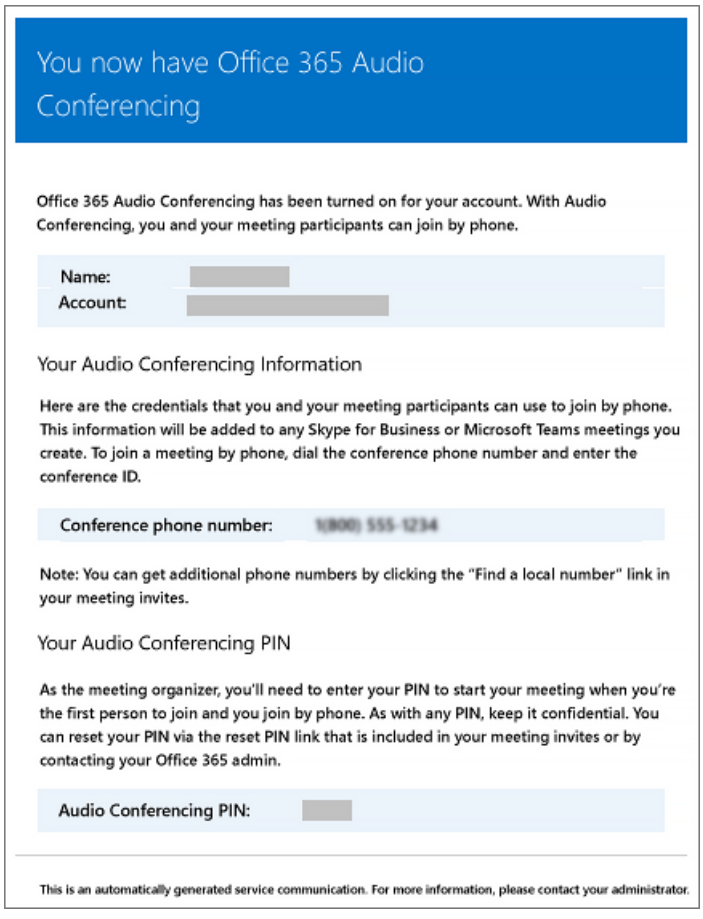
By default, there are four types of email that will be sent to your users who are enabled for Audio Conferencing. However, if you want to limit the number of emails sent to users, you can turn it off. Audio Conferencing in Microsoft 365 or Office 365 will send email to your users' email when:

- **An Audio Conferencing license is assigned to them or when you are changing the audio conferencing provider to Microsoft.**

  This email includes the conference ID, the default conference phone number for the meetings, the audio conferencing PIN for the user, and the instructions and link to use the Skype for Business Online Meeting Update Tool that is used to update existing meetings for the user. See Assign Microsoft Teams add-on licenses or Assign Microsoft as the audio conferencing provider.

> **NOTE**
> If your organization has been enabled for dynamic conference IDs, all of a user's meetings that they schedule will have unique conference IDs. You can set up Audio Conferencing dynamic IDs in your organization.

Here is an example of this email:



You now have Office 365 Audio Conferencing

Office 365 Audio Conferencing has been turned on for your account. With Audio Conferencing, you and your meeting participants can join by phone.

Name: [redacted]
Account: [redacted]

Your Audio Conferencing Information

Here are the credentials that you and your meeting participants can use to join by phone. This information will be added to any Skype for Business or Microsoft Teams meetings you create. To join a meeting by phone, dial the conference phone number and enter the conference ID.

Conference phone number: [redacted]

Note: You can get additional phone numbers by clicking the "Find a local number" link in your meeting invites.

Your Audio Conferencing PIN

As the meeting organizer, you'll need to enter your PIN to start your meeting when you're the first person to join and you join by phone. As with any PIN, keep it confidential. You can reset your PIN via the reset PIN link that is included in your meeting invites or by contacting your Office 365 admin.

Audio Conferencing PIN: [redacted]

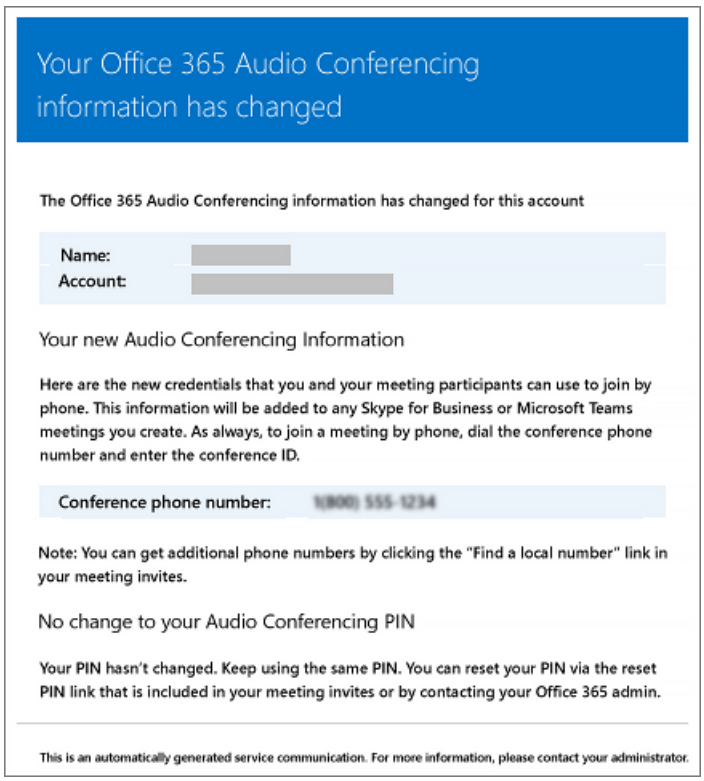
This is an automatically generated service communication. For more information, please contact your administrator.

To find out more about licensing, see Microsoft Teams add-on licensing.

- **The conference ID or default conference phone number of a user changes.**

  This email contains the conference ID, default conference phone number, and the instructions and link to use the Skype for Business Online Meeting Update Tool that is used to update existing meetings for the user. But this email doesn't include the user's audio conferencing PIN. See Reset a conference ID for a user.

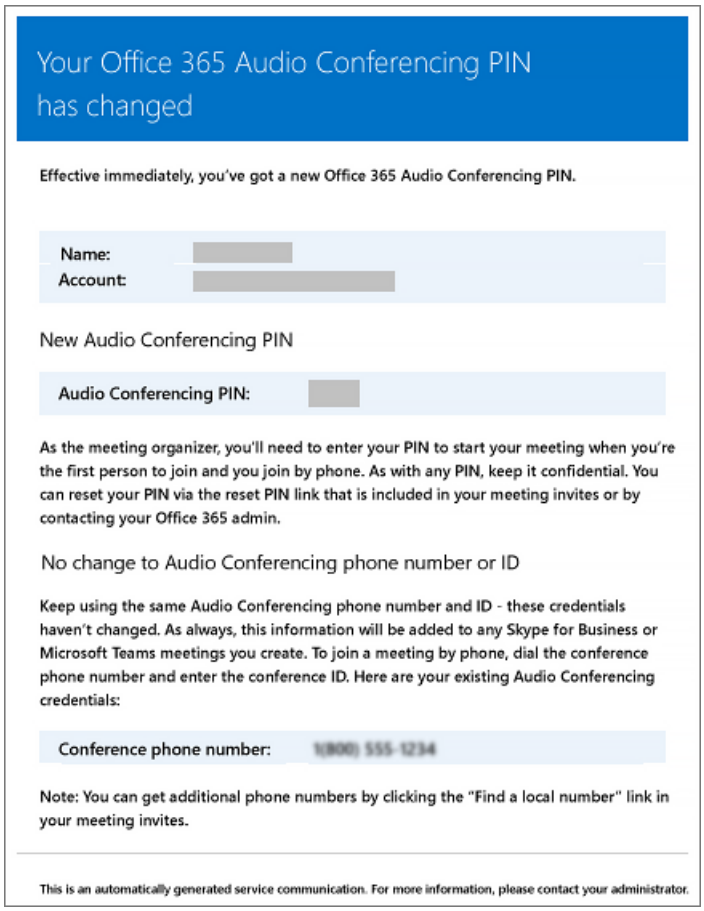
  Here is an example of this email:



- **The audio conferencing PIN of a user is reset.**

  This email contains the organizer's audio conferencing PIN, the existing conference ID, and default conference phone number for the user. See Reset the Audio Conferencing PIN.

  Here is an example of this email:

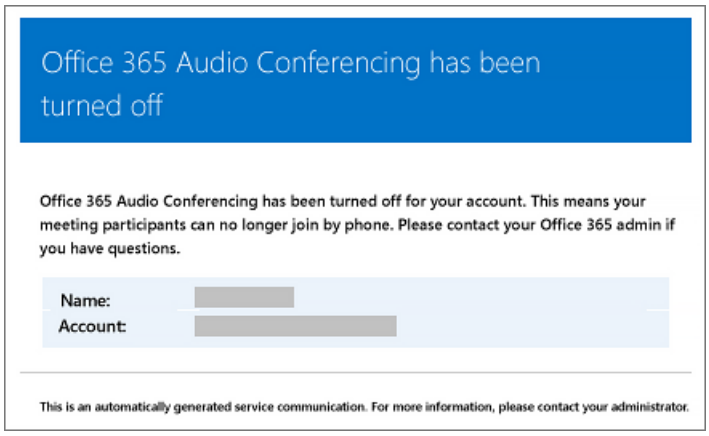


- **A user's license is removed or when audio conferencing provider changes from Microsoft to other provider or None.**

  This happens when the **Audio Conferencing** license is removed from a user or when setting the audio conferencing provider to **None**.

  See Assign or remove licenses for Microsoft 365 for business.

  Here is an example of this email:



> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Make changes to the email messages that are sent to them

You can make changes to the email that is automatically sent to users. By default, the sender of the emails will be from Microsoft 365 or Office 365, but you can change the display name using Windows PowerShell. See the

Microsoft Teams PowerShell reference for more information.

What if you don't want email to be sent to them?

When you disable sending emails to users, email won't be sent even when a user gets assigned a license. In this case, the conference ID, default conferencing phone number, and, more importantly, their audio conferencing PIN won't be sent to the user. When this happens, you must tell the user by sending them a separate email or by calling them.

By default, emails will be sent to your users, but if you want to prevent them from receiving email for audio conferencing, you can use Microsoft Teams or Windows PowerShell.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, enable or disable **Automatically send emails to users if their dial-in settings change**.
4. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

Want to know more about Windows PowerShell?

By default, the sender of the emails will be from Microsoft 365 or Office 365, but you can change the email address and display name using Windows PowerShell.

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Enable or disable sending emails when Audio Conferencing settings change

Send an email to a user with their Audio Conferencing information

Enable users to record their name when they join a meeting in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

When you are setting up Audio Conferencing in Microsoft 365 or Office 365, you will receive phone numbers and what is called an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers that can be a dedicated or shared phone number.

The conferencing bridge answers a call for a user who is dialing in to a meeting using a phone. The conferencing bridge answers the caller with voice prompts from an auto attendant, and then, depending on their settings, can play notifications, ask callers to record their name, and set up the PIN security for meeting organizers. PINs are given to meeting organizers to allow them to start a meeting. However, you can set it up so a PIN isn't required to start a meeting.

Set whether callers should record their name



Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. Enable or disable **Meeting entry and exit notifications**.
4. If enabling notifications, choose **Names or phone numbers** under **Entry/exit announcement type**, and then turn on **Ask callers to record their name before joining a meeting.**
5. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing

Turn on or off entry and exit announcements for meetings in Microsoft Teams

7/22/2020 • 2 minutes to read • Edit Online

When you are setting up Audio Conferencing in Microsoft 365 or Office 365, you will get an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers that people will use to call in to a Microsoft Teams meeting.

The conferencing bridge answers a call for a user who is dialing in to a meeting using a phone. The conferencing bridge answers the caller with voice prompts from a conferencing auto attendant, and then, depending on your settings, can play notifications, ask callers to record their name, and set up the PIN security. A PIN is given to a Microsoft Teams meeting organizer, and it allows them to start a meeting if they can't start the meeting using the Microsoft Teams app. You can, however, set it so that a PIN isn't required to start a meeting.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Setting meeting join options

Using the Microsoft Teams admin center

You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

1. Log in to the admin center.
2. In the left navigation, go to **Meetings** > **Conference Bridges**.
3. At the top of the **Conference Bridges** page, click **Bridge Settings**.
4. In the **Bridge settings** pane, enable or disable **Meeting entry and exit notifications**. This is selected by default. If you clear it, users who have already joined the meeting won't be notified when someone enters or leaves the meeting.
5. Under **Entry/exit announcement type**, select **Names or phone numbers** or **Tones**.

   > **NOTE**
   > By default, external participants can't see the phone numbers of dialed-in participants. If you want to maintain the privacy of these phone numbers, select **Tones** for **Entry/exit announcement type** (this prevents the numbers from being read out by Teams).

6. If you chose **Names or phone numbers**, enable or disable **Ask callers to record their name before joining the meeting**.
7. Click **Save**.

Want to know more about Windows PowerShell

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows

PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Microsoft 365 or Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Audio Conferencing common questions

Use NDI® technology in Microsoft Teams

10/1/2020 • 2 minutes to read • Edit Online

NewTek NDI® (Network Device Interface) technology is a modern solution for connecting media devices (such as a studio camera and mixer). Instead of using physical connections, NDI® technology enables connectivity over a local intranet, including on a local machine.

NDI® technology has become a standard industry solution for producing live content for streams and has gained significant awareness and adoption in the professional broadcast world.

Skype previously added NDI®-out functionality to Skype in late 2018. Microsoft Teams uses this functionality to improve the meeting experience.

NDI® technology is limited to a local network and should only be considered a part of the production workflow, not a broadcast solution.

Turn on NDI® technology

NDI® technology requires two steps to be turned on for a user.

1. The tenant admin must enable the 'AllowNDIStreaming' property in CsTeamsMeetingPolicy.

```
Set-CsTeamsMeetingPolicy -Identity MEETING_POLICY -AllowNDIStreaming $true
```

2. After this change has populated, the end user must turn on NDI® technology for their specific client from **Settings** > **Permissions**.

When a user joins a meeting, they'll see a message that notifies them that the meeting is being broadcast. If users don't want to be included in the broadcast, they'll need to drop from the meeting.

The following image shows the banner message that a user sees in a Teams meeting.



The banner has a link to the Microsoft privacy policy.

Supported locales and user types

NDI® technology is supported in all locales. The following users are included in an NDI® technology stream, but not all users can access the NDI® technology stream:

- In-tenant – full support, delivered based on ring/tenantId/userId (controlled by Meetings Policy)
- Federated – no stream access (even when they have NDI® technology on)[1]
- Premium - no stream access
- Anonymous – no stream access
- Guest – no stream access

[1] Devices have an NDI® technology setting that is on by default. If a meeting participant is using a device with NDI® technology off, they'll need to turn on NDI® technology.

Raise your hand option in Teams meetings

6/16/2020 • 2 minutes to read • Edit Online

During a Microsoft Teams meeting, a participant can use the **Raise your hand** option to get the speaker's and moderator's attention.

This feature is important for the following reasons:

- Participants can signal that they want to talk without disrupting the meeting.
- The moderator or speaker can see if anyone in the meeting wants to talk.
- **Raise your hand** makes meetings more inclusive by encouraging participation from participants.
- **Raise your hand** provides a simple, quick way to take a poll of meeting participants.

A Teams admin doesn't have to create a policy for the feature to appear in a meeting.

Raise your hand display

Raise your hand is always available in any meeting you join and is supported on all clients except meeting room devices (at the moment).

- A raised hand is visible to all meeting participants and indicated by a hand icon.
- Raised hands are shown in the meeting stage, roster (sorted by duration), and when sharing content.
- The raised hand is displayed as yellow adjacent to a participant's name.

Once participants has been acknowledged, they can use the **Lower your hand** option. Meeting presenters can also lower a participant's hand.

Related article

Raise your hand in a Teams meeting

Microsoft Teams meetings on unsupported browsers

8/17/2020 • 2 minutes to read • Edit Online

Some browsers, such as Internet Explorer 11, Safari, and Firefox, support the Microsoft Teams web app but don't support some of the Teams calling and meeting features. To work around this limitation, the Teams web app lets users receive audio through a PSTN connection and lets them view presented content (screen share) at a reduced display rate.

> **NOTE**
>
> Microsoft 365 apps and services will not support Internet Explorer 11 starting August 17, 2021 (Microsoft Teams will not support Internet Explorer 11 earlier, starting November 30, 2020). Learn more. Please note that Internet Explorer 11 will remain a supported browser. Internet Explorer 11 is a component of the Windows operating system and follows the Lifecycle Policy for the product on which it is installed.

When Teams detects an unsupported browser, it automatically displays a message explaining the issue and the session limitations. The message provides further instructions for accessing the meeting audio, such as advising the user to leave a call back number so that Teams can call the user, or instructing the user to call the conference number included in the meeting invitation. The message also encourages the user to download and use the Teams desktop client for the full Teams experience.

If PSTN is unavailable, the user won't see the instructions for accessing the meeting and won't be able to join the meeting.

Browser limitations

People who use the Teams web app on unsupported browsers will experience the following limitations:

- Audio is available through a PSTN connection only. Users can't use their microphone.
- Users can't share their camera or see other participants' videos but can view presented content through image-based screen sharing.
- Users can't share their screen, although they can see a screen that another meeting participant shares.
- Users can't take control during a screen sharing session.
- Users won't receive incoming call notifications.
- If the call is interrupted, the meeting won't automatically reconnect.
- Users can't start meetings.

For more information about browser support in Teams, see Limits and specifications for Teams.

Related topics

- Join a Teams meeting on an unsupported browser

Configure desktop sharing in Microsoft Teams

9/14/2020 • 2 minutes to read • Edit Online

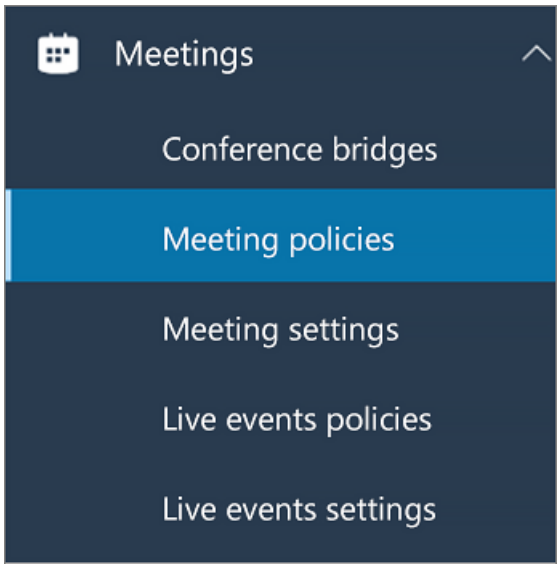
Desktop sharing lets users present a screen or app during a meeting or chat. Admins can configure screen sharing in Microsoft Teams to let users share an entire screen, an app, or a file. You can let users give or request control, allow PowerPoint sharing, add a whiteboard, and allow shared notes. You can also configure whether anonymous or external users can request control of the shared screen. External participants in Teams meetings can be categorized as follows:

- Anonymous user
- Guest users
- B2B user
- Federated user

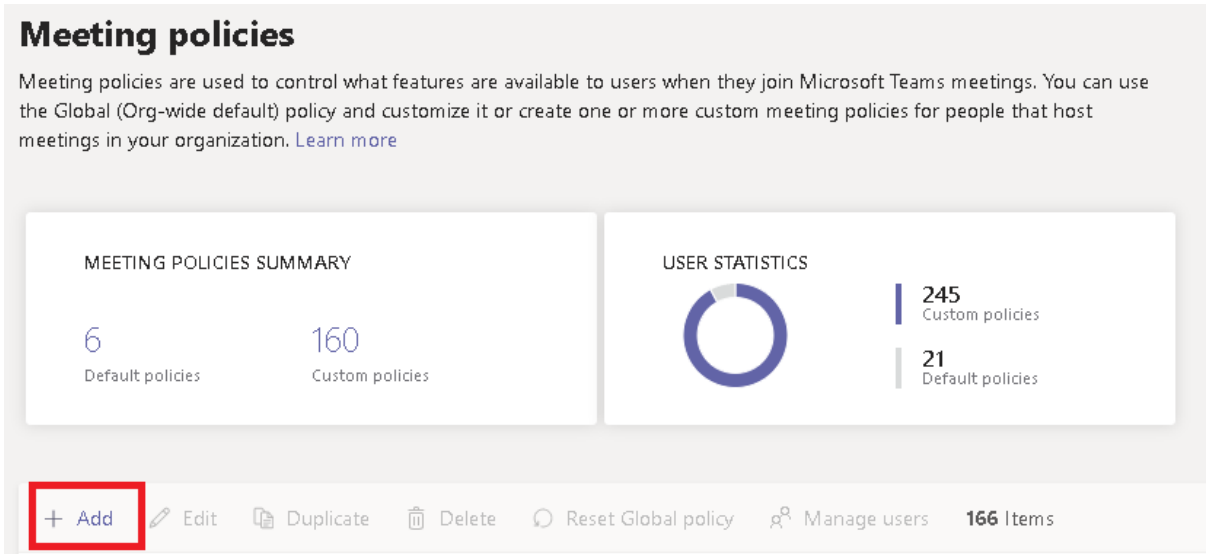
To configure screen sharing, you create a new meetings policy and then assign it to the users you want to manage.

In the Microsoft Teams admin center

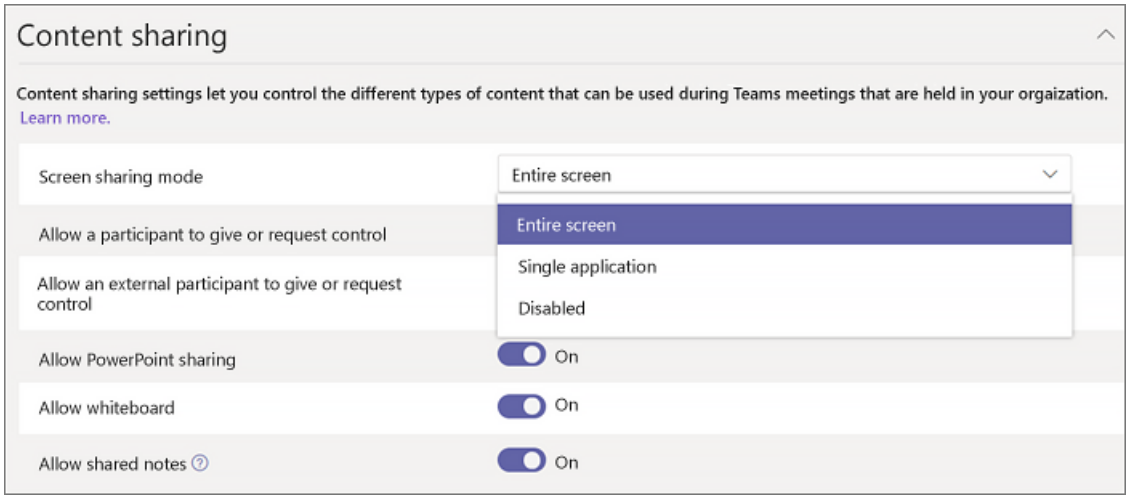
1. Select **Meetings** > **Meeting policies**.



2. On the **Meeting policies** page, select **Add**.



3. Give your policy a unique title and enter a brief description.
4. Under **Content sharing**, choose a **Screen sharing mode** from the drop-down list:
   - **Entire screen** – lets users share their entire desktop.
   - **Single application** – lets users limit screen sharing to a single active application.
   - **Disabled** – Turns off screen sharing.



> **NOTE**
> You don't have to enable the calling policy in order for users to use screen share from chat. However, their audio is turned off until they unmute themselves. In addition, the user sharing the screen can click **Add Audio** to enable audio. If the calling policy is disabled, users won't be able to add audio to the screen share from a chat session.

5. Turn the following settings on or off:
   - **Allow a participant to give or request control** – lets members of the team give or request control of the presenter's desktop or application.
   - **Allow an external participant to give or request control** – This is a per-user policy. Whether an organization has this set for a user doesn't control what external participants can do, regardless of what the meeting organizer has set. This parameter controls whether external participants can be given control or request control of the sharer's screen, depending on what the sharer has set within their organization's meeting policies.
   - **Allow PowerPoint sharing** - lets users create meetings that allow PowerPoint presentations to be uploaded and shared.
   - **Allow whiteboard** – lets users share a whiteboard.
   - **Allow shared notes** – lets users take shared notes.
6. Click **Save**.

Use PowerShell to configure shared desktop

You can also use the Set-CsTeamsMeetingPolicy cmdlet to control desktop sharing. Set the following parameters:

- Description
- ScreenSharingMode
- AllowPrivateCalling
- AllowParticipantGiveRequestControl
- AllowExternalParticipantGiveRequestControl
- AllowPowerPointSharing
- AllowWhiteboard

- AllowSharedNotes

Learn more about using the csTeamsMeetingPolicy cmdlet.

Teams cloud meeting recording

12/5/2020 • 11 minutes to read • Edit Online

In Microsoft Teams, users can record their Teams meetings and group calls to capture audio, video, and screen sharing activity. There is also an option for recordings to have automatic transcription, so that users can play back meeting recordings with closed captions and search for important discussion items in the transcript. The recording happens in the cloud and is saved to Microsoft Stream, so users can share it securely across their organization.

Related: Teams meeting recording end user documentation

> **NOTE**
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to OneDrive for Business and SharePoint for meeting recordings.

> **NOTE**
> For information about using roles in Teams meetings, and how to change users' roles, see Roles in a Teams meeting.

Prerequisites for Teams cloud meeting recording

For a Teams user's meetings to be recorded, Microsoft Stream must be enabled for the tenant. In addition, the following prerequisites are required for both the meeting organizer and the person who is initiating the recording:

- User has Office 365 E1, E3, E5, A1, A3, A5, Microsoft 365 Business Premium, Business Standard, or Business Basic[1]
- User needs to be licensed for Microsoft Stream[2]
- User has Microsoft Stream upload video permissions
- User has consented to the company guidelines, if set up by the admin
- User has sufficient storage in Microsoft Stream for recordings to be saved
- User has TeamsMeetingPolicy-AllowCloudRecording setting set to true
- User is not an anonymous, Guest, or federated user in the meeting
- To enable transcription for a user's meeting, the Teams meeting policy they are assigned to must have the -AllowTranscription setting set to true.

[1] As of August 20, 2020, access to the meeting recording file will expire after 21 days for users with A1. For more information, see Upload a Microsoft Teams meeting recording to Stream.

[2] User needs to be licensed to upload/download meetings to/from Microsoft Stream, however they do not need the license to record a meeting. If you wish to block a user from recording a Microsoft Teams Meeting, you must grant a TeamsMeetingPolicy that has AllowCloudRecording set to $False.

IMPORTANT

Users won't need a Microsoft Stream license assigned if you want users to only record and download the recordings. This will mean that the recordings aren't stored in Microsoft Stream but are instead stored in Azure Media Services (AMS) with a 21-day limit before it's deleted. It's not something at this point that an admin can control or manage including the ability to delete it.

Set up Teams cloud meeting recording for users in your organization

This section explains how you can set up and plan for recording Teams meetings.

Turn on Microsoft Stream for users in the organization

Microsoft Stream is available as part of eligible Microsoft 365 and Office 365 subscriptions or as a standalone service. See the Stream licensing overview for more details. Microsoft Stream is now included in Microsoft 365 Business, Microsoft 365 Business Standard, and Microsoft 365 Business Basic.

Learn more about how you can assign licenses to users in Microsoft 365 or Office 365 so that users can access Microsoft Stream. Ensure that Microsoft Stream is not blocked for the users, as defined in Block sign-ups for Microsoft Stream.

Make sure users have upload video permissions in Microsoft Stream

By default, everyone in the company can create content in Stream, once Stream is enabled and the license is assigned to the user. A Microsoft Stream administrator can restrict employees for creating content in Stream. The users who are in this restricted list will not be able to record meetings.

Notify employees to consent to company guidelines in Microsoft Stream

If a Microsoft Stream administrator has set up company guideline policy and requires employees to accept this policy before saving content, users must do so before recording in Microsoft Teams. Before you roll out the recording feature in the organization, make sure users have consented to the policy.

Turn on or turn off cloud recording

You can use the Microsoft Teams admin center or PowerShell to set a Teams meeting policy to control whether user's meetings can be recorded.

In the Microsoft Teams admin center, turn on or turn off the **Allow cloud recording** setting in the meeting policy. To learn more, see Manage meeting policies in Teams.

Using PowerShell, you configure the AllowCloudRecording setting in TeamsMeetingPolicy. To learn more, see New-CsTeamsMeetingPolicy and Set-CsTeamsMeetingPolicy.

Note that both the meeting organizer and the recording initiator need to have the recording permissions to record the meeting. Unless you have assigned a custom policy to the users, users get the Global policy, which has AllowCloudRecording enabled by default.

NOTE

For more information about using Teams roles to configure who has permission to record a meeting, see Roles in a Teams meeting.

For a user to fall back to the Global policy, use the following cmdlet to remove a specific policy assignment for a user:

```
Grant-CsTeamsMeetingPolicy -Identity {user} -PolicyName $null -Verbose
```

To change value of AllowCloudRecording in the Global policy, use the following cmdlet:

```
Set-CsTeamsMeetingPolicy -Identity Global -AllowCloudRecording $false
```

SCENARIO	STEPS
I want all users in my company to be able to record their meetings	1. Confirm Global CsTeamsMeetingPolicy has AllowCloudRecording = True 2. All users have the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = True
I want the majority of my users to be able to record their meetings but selectively disable specific users who are not allowed to record	1. Confirm GlobalCsTeamsMeetingPolicy has AllowCloudRecording = True 2. Majority of the users have the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = True 3. All other users have been granted one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = False
I want recording to be 100% disabled	1. Confirm Global CsTeamsMeetingPolicy has AllowCloudRecording = False 2. All users have been granted the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = False
I want recording to be turned off for the majority of the users but selectively enable specific users who are allowed to record	1. Confirm Global CsTeamsMeetingPolicy has AllowCloudRecording = False 2. Majority of the users have been granted the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = False 3. All other users have been granted one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = True

Where your meeting recordings are stored

Meeting recordings are stored in Microsoft Stream cloud storage. Recordings are retained and available for viewing and download for 21 days. Currently, the meeting recording feature is turned off for customers whose Teams data is stored in-country if Microsoft Stream isn't available in the in-country data residency region where the data is stored. In the future, the meeting recording feature will be turned on for customers whose data is stored in-country even if Microsoft Stream isn't available in the in-country data residency region.

When this change takes effect, meeting recordings will be stored by default in the nearest geographic region for Microsoft Stream. If your Teams data is stored in-country and you prefer to store meeting recordings in-country, we recommend that you turn off the feature, and then turn it on after Microsoft Stream is deployed to your in-country data residency region. To turn off the feature for all users in your organization, turn off the **Allow cloud**

recording setting in the Global Teams meeting policy, which is in the Microsoft Teams admin center. If, however, you still wish to enable recordings to be stored in the nearest geographic region for Microsoft Stream, you must turn on both **Allow cloud recording** and **Allow Recording Storage Outside Region** before this change takes place.

To enable recordings in region the Global policy, use the following cmdlet:

```
Set-CsTeamsMeetingPolicy -Identity Global – AllowCloudRecording $true -AllowRecordingStorageOutsideRegion
$true
```

Here's a summary of what happens when you turn on meeting recording when this change takes effect:

IF YOU TURN ON MEETING RECORDINGS...	MEETING RECORDINGS ARE STORED...
Before Microsoft Stream is available in your in-country data residency region	In the nearest Microsoft Stream region
After Microsoft Stream is available in your in-country data residency region	In your in-country data residency region

For new and existing tenants that haven't yet turned on meeting recording, new recordings are stored in-country after Microsoft Stream is available in the in-country data residency region. However, any tenant that enables meeting recording before Microsoft Stream is available in the in-country data residency region will continue to use the Microsoft Stream storage for existing and new recordings, even after Microsoft Stream is available in the in-country data residency region.

To find the region where your Microsoft Stream data is stored, in Microsoft Stream, click **?** in the upper-right corner, click **About Microsoft Stream**, and then click **Your data is stored in**. To learn more about the regions where Microsoft Stream stores data, see Microsoft Stream FAQ.

To learn more about where data is stored across services in Microsoft 365 or Office 365, see Where is your data located?

Turn on or turn off recording transcription

This setting controls whether captions and transcription features are available during playback of meeting recordings. If you turn this off, the **Search** and **CC** options won't be available during playback of a meeting recording. The person who started the recording needs this setting turned on so that the recording also includes transcription.

> **NOTE**
> That transcription for recorded meetings is currently only supported for users who have the language in Teams set to English and when English is spoken in the meeting. They are stored together with the meeting recordings in Microsoft Stream cloud storage.

You can use the Microsoft Teams admin center or PowerShell to set a Teams meeting policy to control whether the recording initiator gets a choice to transcribe the meeting recording.

In the Microsoft Teams admin center, turn on or turn off the **Allow transcription** setting in the meeting policy. To learn more, see Manage meeting policies in Teams.

Using PowerShell, you configure the AllowTranscription setting in TeamsMeetingPolicy. To learn more, see New-CsTeamsMeetingPolicy and Set-CsTeamsMeetingPolicy.

Unless you have assigned a custom policy to the users, users get the Global policy, which has AllowTranscription

disabled by default.

For a user to fall back to Global policy, use the following cmdlet to remove a specific policy assignment for a user:

```
Grant-CsTeamsMeetingPolicy -Identity {user} -PolicyName $null -Verbose
```

To change value of AllowCloudRecording in the Global policy, use the following cmdlet:

```
Set-CsTeamsMeetingPolicy -Identity Global -AllowTranscription $false
```

SCENARIO	STEPS
I want all users in my company to be able to transcribe when initiating recording of a meeting	1. Confirm Global CsTeamsMeetingPolicy has AllowTranscription = True 2. All users have the Global csTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowTranscription = True.
I want the majority of my users to be able to transcribe the meeting recordings, but selectively disable specific users who are not allowed to transcribe	1. Confirm Global CsTeamsMeetingPolicy has AllowTranscription = True 2. Majority of the users have the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowTranscription = True 3. All other users have been granted one of the CsTeamsMeetingPolicy policies with AllowTranscription = False
I want transcription of the recording to be 100% disabled	1. Confirm Global CsTeamsMeetingPolicy has AllowTranscription = False 2. All users have been granted the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowTranscription = False
I want transcription to be disabled for the majority of the users but selectively enable specific users who are allowed to transcribe	1. Confirm Global CsTeamsMeetingPolicy has AllowCloudRecording = False 2. Majority of the users have been granted the Global CsTeamsMeetingPolicy OR one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = False 3. All other users have been granted one of the CsTeamsMeetingPolicy policies with AllowCloudRecording = True

Planning for storage

The size of a 1-hour recording is 400 MB. Make sure you understand the capacity required for recorded files and have sufficient storage available in Microsoft Stream. Read Microsoft Stream Licensing overview to understand the base storage included in the subscription and how to purchase additional storage.

Manage meeting recordings

The meeting recordings are considered tenant-owned content. If the owner of the recording leaves the company, the admin can open the recording video URL in Microsoft Stream in admin mode. The admin can delete the recording, update any recording metadata, or change permissions for the recording video. Learn more about admin capabilities in Stream.

> **NOTE**
>
> See Manage user data in Microsoft Stream and Permissions and privacy in Microsoft Stream for additional information on managing recordings and user access.

Compliance and eDiscovery for meeting recordings

The meeting recordings are stored in Microsoft Stream, which is Microsoft 365 and Office 365 Tier-C compliant. To support e-Discovery requests for compliance admins who are interested in meeting or call recordings for Microsoft Streams, the recording completed message is available in the compliance content search functionality for Microsoft Teams. Compliance admins can look for the keyword "recording" in the subject line of the item in compliance content search preview and discover meeting and call recordings in the organization. A prerequisite for them to view all recordings is that they will need to be set up in Microsoft Stream with admin access. Learn more about assigning admin permissions in Stream.

Related topics

- Teams PowerShell overview

Use OneDrive for Business and SharePoint or Stream for meeting recordings

12/5/2020 • 9 minutes to read • Edit Online

> **NOTE**
> The change from using Microsoft Stream to OneDrive for Business and Microsoft SharePoint for meeting recordings will be a phased approach.

DATE	EVENT
October 5, 2020	You can enable the Teams Meeting policy to have meeting recordings saved to OneDrive for Business and SharePoint instead of Microsoft Stream (Classic)
Rolling out starting January 11, 2021	All new Teams meeting recordings will be saved to OneDrive for Business and SharePoint unless you delay this change by modifying your organization's Teams Meeting policies and explicitly setting them to **Stream**. Seeing the policy reporting as Stream is not enough. You need to explicitly set the policy value to **Stream**.
Rolling out starting March 1, 2021	**Enterprise customers** No new meeting recordings can be saved to Microsoft Stream (Classic); all customers will automatically have meeting recordings saved to OneDrive for Business and SharePoint even if they've changed their Teams meeting policies to **Stream**. We recommend that customers roll this feature out before this date so that they can control the timing of the release.
Rolling out starting July 7, 2021	**Education customers** No new meeting recordings can be saved to Microsoft Stream (Classic); all customers will automatically have meeting recordings saved to OneDrive for Business and SharePoint even if they've changed their Teams meeting policies to **Stream**. We recommend that customers roll this feature out before this date so that they can control the timing of the release. We have updated this schedule to provide education customers the ability to complete in-progress semesters.

> **NOTE**
> We recommend that Enterprise and Educational customers, to better control the change in your organization, opt in whenever you're comfortable with the change rather than wait for it to happen.

Microsoft Teams has a new method for saving meeting recordings. As the first phase of a transition from classic Microsoft Stream to the new Stream, this method stores recordings on Microsoft OneDrive for Business and SharePoint in Microsoft 365 and offers many benefits.

The benefits of using OneDrive for Business and SharePoint for storing recordings include:

- Retention policies for Teams meeting recording (TMR) (S+C E5 autoretention labels)
- Benefit from OneDrive for Business and SharePoint information governance
- Easy to set permissions and sharing
- Share recordings with guests (external users) with explicit share only
- Request access flow
- Provide OneDrive for Business and SharePoint shared links
- Increased quota
- Meeting recordings are available faster
- Go local tenant support
- Multi-geo support – recordings are stored in a region specific to that user
- Bring your own key (BYOK) support
- Improved Transcript quality and speaker attribution

There are some limitations to consider:

- There will be English-only closed captions and transcripts.
- You won't be able to search transcripts or their content.
- You won't be able to edit the transcripts, but you'll be able to toggle captions off/on.
- You can control with whom you share the recording, but you won't be able to block people with shared access from downloading the recording.
- You'll not get an email when the recording finishes saving, but the recording will appear in the meeting chat once it's finished. This will happen much quicker than it did in Stream previously

Watch "Meeting Recording" for more information.

Set up the meeting recording option for OneDrive for Business and SharePoint

The meeting recording option is a setting at the Teams policy level. The following example shows how to set the Global policy. Make sure that you set the meeting recording option for the policy or policies that you've assigned to your users.

> **NOTE**
> Teams meeting policy changes take awhile to propagate. Check back after a few hours of setting it, then sign out and sign in again.

1. Install Skype For Business Online PowerShell. **Note**: Skype for Business Online Connector is currently part of the latest Teams PowerShell module. If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector. See Manage Skype for Business Online with PowerShell.

   a. Download Skype for Business Online PowerShell.

   b. Follow the prompts to install it.

   c. Restart your machine.

2. Launch PowerShell as an admin

3. Import the SkypeOnline Connector and sign in as a Teams admin.

```
Import-Module SkypeOnlineConnector
$sfbSession = New-CsOnlineSession
Import-PSSession $sfbSession
```

4. Use Set-CsTeamsMeetingPolicy to set a Teams Meeting Policy to transition from the Stream storage to OneDrive for Business and SharePoint.

```
Set-CsTeamsMeetingPolicy -Identity Global -RecordingStorageMode "OneDriveForBusiness"
```

> **NOTE**
> If some of your users have assigned a per-organizer or per-user policy, you must set this setting on this policy if you want them to also store the meeting recordings in OneDrive for Business and SharePoint. For more information, see Manage meeting policies in Teams.

Opt out of OneDrive for Business and SharePoint to continue using Stream

Even if a policy says it's set to **Stream**, it might not be set. Typically, if the policy isn't set, then the default setting is **Stream**. However, with this new change, if you want to opt-out of using SharePoint or OneDrive for Business, then you must reset the policy to **Stream** to ensure that it's the default.

```
Set-CsTeamsMeetingPolicy -Identity Global -RecordingStorageMode "Stream"
```

Permissions or role-based access

> **NOTE**
> We recommend that the recipient is required to be a logged in user when sharing Teams Meeting Recordings. This can be achieved by selecting the **People in (Your Organization)** option when sharing the file as documented in Share SharePoint files or folders. External sharing is not designed for the distribution of large files or a large number of files. In order to prevent fraud and abuse scenarios you might experience issues when sharing a large amount of data to external users.

MEETING TYPE	WHO CLICKED ON RECORD?	WHERE DOES THE RECORDING LAND?	WHO HAS ACCESS? R/W, R, OR SHARING
1:1 call with internal parties	Caller	Caller's OneDrive for Business account	Caller is owner and has full rights. Callee (if in the same tenant) has read only access. No sharing access. Callee (if in different tenant) has no access. Caller must share it to the Callee.

MEETING TYPE	WHO CLICKED ON RECORD?	WHERE DOES THE RECORDING LAND?	WHO HAS ACCESS? R/W, R, OR SHARING
1:1 call with internal parties	Callee	Callee's OneDrive for Business account	Callee is owner and has full rights. Caller (if in the same tenant has read-only access. No sharing access. Caller (if in different tenant) has no access. Callee must share it to the Caller.
1:1 call with an external call	Caller	Caller's OneDrive for Business account	Caller is owner and has full rights. Callee has no access. Caller must share it to the Callee.
1:1 call with an external call	Callee	Callee's OneDrive for Business account	Callee is owner and has full rights. Caller has no access. Callee must share it to the Caller.
Group call	Any member of the call	Member who clicked on Record's OneDrive for Business account	Member who clicked on Record has full rights. Other members from the same tenant have Read rights. Other members from different tenant have no rights to it.
Adhoc/Scheduled meeting	Organizer	Organizer's OneDrive for Business account	Organizer has full rights to the recording. All other members of the meeting have read access.
Adhoc/Scheduled meeting	Other meeting member	Member who clicked on Record	Member who clicked on Record has full rights to the recording. Organizer has edit rights and can share. All other members have read access.

MEETING TYPE	WHO CLICKED ON RECORD?	WHERE DOES THE RECORDING LAND?	WHO HAS ACCESS? R/W, R, OR SHARING
Adhoc/Scheduled meeting with external users	Organizer	Organizer's OneDrive for Business account	Organizer has full rights to the recording. All other members of the meeting from the same tenant as the organizer have read access. All other external members have no access, and the Organizer must share it to them.
Adhoc/Scheduled meeting with external users	Other meeting member	Member who clicked on Record	Member who clicked on Record has full rights to the recording. Organizer has edit rights and can share. All other members of the meeting from the same tenant as the organizer have read access. All other external members have no access, and the Organizer must share it to them.
Channel meeting	Channel Member	Teams' SharePoint location for that channel	Member who clicked on Record has edit rights to the recording. Every other member's permissions are based off of the Channel SharePoint permissions.

Frequently asked questions

Where will the meeting recording be stored?

- For non-Channel meetings, the recording is stored in a folder named **Recordings** that is at the top level of the OneDrive for Business that belongs to the person who started the meeting recording. Example:

  recorder's OneDrive for Business/**Recordings**

- For Channel meetings, the recording is stored in the Teams site documentation library in a folder named **Recordings**. Example:

  Teams name - Channel name/**Documents**/**Recordings**

How do I handle recordings from former employees?

Since videos are just like any other file in OneDrive for Business and SharePoint, handling ownership and retention after an employee leaves will follow the normal OneDrive for Business and SharePoint process.

Who has the permissions to view the meeting recording?

- For non-Channel meetings, all meeting invitees, except for external users, will automatically get a personally shared link. External users will need to be explicitly added to the shared list by the meeting organizer or the person who started the meeting recording.
- For Channel meetings, permissions are inherited from the owners and members list in the channel.

How can I manage transcripts?

Customers opting in to this preview will not have closed captions available on their Teams Meeting Recordings that are migrated to OneDrive for Business and SharePoint. We're working to add captioning, beginning with closed captions in English, to meeting recordings in Q4 CY2020.

Closed captions will be available on Teams Meeting Recordings for customers who have opted in to allow transcripts as described in Teams cloud recordings

Captions help create inclusive content for viewers of all abilities. As an owner, you can hide captions, although the transcript will still be available on Teams unless you delete the captions from Teams. See how to turn on or off meeting recordings

Closed captions are supported for Teams meeting recordings for 60 days from when the meeting is recorded.

Closed captions are not fully supported if the Teams Meeting Recording is moved or copied from its original location on OneDrive for Business or SharePoint.

How will my storage quota be impacted?

Teams meeting recording files live in OneDrive for Business and SharePoint and are included in your quota for those services. See SharePoint quota and OneDrive for Business quota.

You get more storage with OneDrive for Business compared with Stream and more fungible storage with SharePoint.

How can I play a Teams meeting recording?

Your video will play on the video player of OneDrive for Business or SharePoint depending on where you access the file.

If you plan on deprecating adding to Stream, will existing videos stay as is and for how long?

Stream as a platform won't be deprecated in the near future. The videos that currently live in Stream will stay there until we start migrating. Upon migration, those videos will be migrated to OneDrive for Business or SharePoint as well. Check here for more information.

How do I apply a retention label?

See How to auto-apply a retention label.

How do I assign policies to my users in Microsoft Teams and which policies take precedence?

See Which policy takes precedence?.

Contact Center integrations for Microsoft Teams

12/5/2020 • 5 minutes to read • Edit Online

Integrating popular contact center solutions with Microsoft Teams is a common need for customers deploying Teams Calling capabilities. This article provides an overview of how contact center solutions can be integrated with Microsoft Teams and additional information on the partner solutions participating in the Microsoft Teams Connected Contact Center Certification Program.

What is a Contact Center integration for Microsoft Teams?

Today's contact centers provide much more than support – they act as one of the main vehicles for interaction and unfiltered feedback on a customer's experience with a brand. Due to the breadth of channels that today's customers prefer to engage across – phone, email, text, social – and the expanded volume of touch points associated with present day purchase processes, many organizations have realized two additional realities:

1. Every member of the organization has the potential to be involved in engaging a customer directly and therefore needs to be equipped with the appropriate tools.
2. This expanded scope of customer interactions requires tools that can help drive consistency, constant improvement, and scale.

Microsoft Teams supports customer interaction work streams by acting as the hub for internal and external customer connection across its modes of communication including chat, video meetings and calling. For some companies, Microsoft Teams' cloud voice capabilities, including auto attendant and call queues, provide the features and configuration to meet their needs.

For others who desire integrated solutions with business tools and workflows to drive the customer journey, Microsoft Teams also integrates with some of the industry's leading Contact Center as a Service (CCaaS) solution providers.

Connected Contact Center for Microsoft Teams Certification Program

The APIs allow partners to develop and integrate CCaaS solutions for Teams. In addition, we have developed the Connected Contact Center for Microsoft Teams Certification Program to provide customers with the assurance that each participating partner's solution has been tested and verified to provide the quality, compatibility and reliability they expect from Microsoft solutions.

The following partners are in the process of certifying their solution for Microsoft Teams and are ready to engage customers:

PARTNER	SOLUTION WEBSITE
`Anywhere365`	https://anywhere365.io/direct-routing-contact-center-for-microsoft-teams/
`Competella`	https://www.competella.com/microsoft-teams-skype-for-business
`ComputerTalk`	https://www.computer-talk.com/product/enterprise-contact-center/ice-contact-center-for-teams

PARTNER	SOLUTION WEBSITE
`ContactCenter4All`	www.contactcenter4all.com
'Content Guru'	https://www.contentguru.com/microsoft-teams-integration/
`Enghouse Interactive`	http://www.enghouseteams.com/
`Five9`	https://www.five9.com/products/application-integration/uc-integration
`Genesys`	https://www.genesys.com/microsoft
`Landis Technologies`	https://landistechnologies.com/microsoft-teams-contact-center/
`Luware`	https://luware.com/en/solutions/
`NICE inContact`	https://www.niceincontact.com/microsoft-teams
`novomind`	https://www.novomind.com/en/customer-service-software-call-center/microsoft-teams/
`Tendfor`	https://www.tendfor.com/en/

This list will be updated as more partners join and meet the certification criteria.

How do contact center solutions work in Microsoft Teams?

Microsoft Teams offers a range of capabilities to support the development of third-party voice solutions, including:

1. Direct Routing Connectivity
2. Microsoft Graph Cloud Communication APIs
3. Teams platform and extensibility
4. Teams SDKs

Together, these capabilities enable 3 models of integration:

- **Connect** (via Direct Routing)
- **Connect and Extend** (Direct Routing, Graph APIs and Teams apps platform)
- **Extend and Power** (embedding Teams SDKs into 3p Apps for native Teams interactions)

Connect

This model connects CCaaS partners with Microsoft Teams phone system infrastructure, enabling enhanced routing, configuration and system insights. In this model, the contact center partner solution can also provide telephony services for selected numbers and users.

Agents using solutions built on the Connect model can gather information & insights and if necessary transfer calls to subject matter experts directly, leveraging the SME's presence in Teams to ensure their availability.

Organizations can make sure calls route to the optimal agent by setting up automated virtual assistants and skill-based routing queues.

Feature highlights:

While the following is not a comprehensive list of feature capabilities for this model of integration, the focus areas include:

- Office 365 authN for agents to allow agents to connect to their Microsoft tenant from their integrated CCaaS client
- Presence indication from Teams users
- Call flows via Direct Routing (as indicated in test plans)
- Support transfers and group calls with Teams users
- Teams Graph APIs and Cloud Communication APIs for integration with Teams
- Able to support multi-tenant SIP trunking to support several customers on partner's SBC.
- Partners to implement Microsoft certified session border controller (SBC)

Connect and extend

This model extends contact center personnel and agent experiences by integrating with the Teams client using the Teams client platform, Teams Graph APIs and Cloud Communications API in Microsoft Graph and uses the Teams phone system for all contact center calls and call control experiences. In this model, the contact center partner acts as a telephony carrier alongside Microsoft 365.

Leveraging Connect and Extend-based solutions, agents can benefit from dynamic, contextual notes correlating data from multiple systems prior to starting an engagement and then avoid costly context switching by working natively within Teams for both internal collaboration and external communications.

Organizations can design workflows and advanced routing configurations down to the individual and measure the quality of their system and interactions.

Feature highlights:

While the following is not a comprehensive list of feature capabilities for this model of integration, it does highlight the main focus areas:

- Teams Graph APIs and Cloud Communication APIs for integration with Teams
- Teams based app for agent experiences
- Teams as the primary calling endpoint for the agents
- Teams client calling for all the call controls
- Agent experience app should be able to work on Teams web and mobile client as well
- Analytics, Workflow management, role-based experiences for Agents within the CCaaS app within Teams
- Chat and collaboration experiences integrated with Teams clients
- Preserve performance and quality of Teams client experiences in all apps

Extend and power

This model enables partners to create native Azure-based voice applications leveraging the Teams calling infrastructure and client platform to deliver modern, intelligent solutions for collaborative customer and agent connection. The goal of Extend and Power is to stoke developer creativity and drive customer productivity.

By building directly on Azure, partners can rapidly deploy and provision their solution across all Teams regions and geographies, benefitting from our shared, global communications network while taking advantage of Azure's storage, compute, analytics & cognitive services.

With the Extend and Power integration model, partners can provide contact center agents with omni-channel communication experiences while incorporating artificial intelligence to customize how and when participants - or other services - are engaged in a call leveraging the Cloud Communications API in Microsoft Graph.

Feature highlights:

While the following is not a comprehensive list of feature capabilities for this model of integration, these highlight areas in addition to those provided by the Connect and Extend model.

- Formal agent experiences natively enabled for omni-channel communication via Teams SDK
- Leverage Teams collaboration services for agent collaboration and customer interactions
- Rapid provisioning of cloud services, deploy anywhere
- Direct conversation control and interaction with users during Teams conversations

Comparing connected contact center integration models

Please review the table below for an overview of the integration models that Microsoft Teams supports.

	TEAMS VOICE APPS	CONNECT	EXTEND	POWER
Cloud service model	Azure	Partner	Partner + Azure	Azure
Who operates the solution?	Microsoft	Partner	Partner	Partner
M365 Sign-in	Yes	Yes	Yes	Yes
Users with Teams calling?	Informal, SME	Informal, SME	Informal, SME, Formal	Informal, SME, Formal
IW/SME experience	Teams	Teams	Teams + extensions	Teams + extensions
Service connectivity	Platform (Calling Plans +DR)	Direct routing	Platform (Calling Plans + DR)	Platform (Calling Plans + DR)

Next steps

If you are a vendor seeking to join the certification program, please email Teamscategorypartner@microsoft.com.

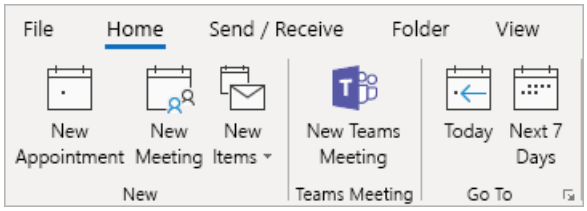
Use the Teams Meeting add-in in Outlook

12/5/2020 • 8 minutes to read • Edit Online

The Teams Meeting add-in lets users schedule a Teams meeting from Outlook. The add-in is available for Outlook on Windows, Mac, web, and mobile.

Teams Meeting add-in in Outlook for Windows

The Teams Meeting add-in is automatically installed for users who have Microsoft Teams and either Office 2013, Office 2016, or Office 2019 installed on their Windows PC. Users will see the Teams Meeting add-in on the Outlook Calendar ribbon.



NOTE

- There is **no direct URL** that links to the Teams add-in.
- There are additional considerations if your organization runs both Teams and Skype for Business. Under some circumstances, the Teams add-in is not available in Outlook. See Upgrade from Skype for Business to Teams for details.
- User permissions to execute the Regsvr32.exe file is a minimum requirement for the Teams Meeting add-in to be installed on the computer.
- If users do not see the Teams Meeting add-in, instruct them to close Outlook and Teams, then restart the Teams client first, then sign in to Teams, and then restart the Outlook client, in that specific order.
- If you are using an Office Outlook installation from the Microsoft Store, the Teams Meeting add-in isn't supported. Users who require this add-in are advised to install Click-to-Run version of Office, as outlined in Office on Windows 10 in S mode article.

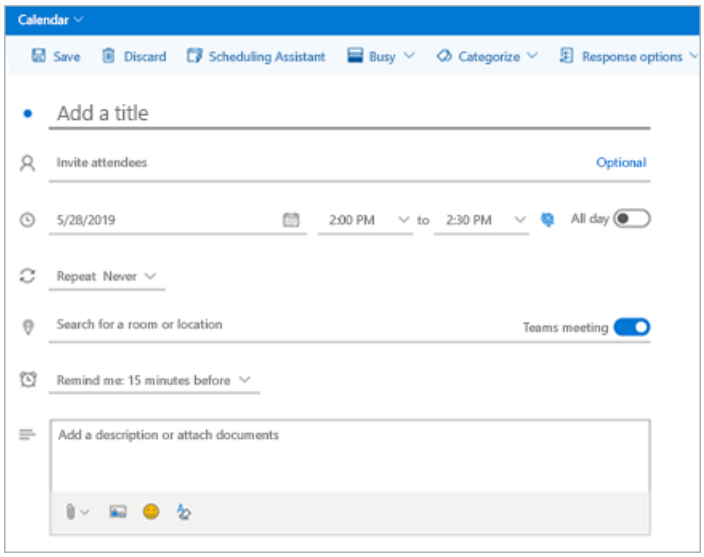
Teams Meeting add-in in Outlook for Mac

The Teams Meeting button in Outlook for Mac will appear in the Outlook for Mac ribbon if Outlook is running production build 16.24.414.0 and later and is activated with a Microsoft 365 or Office 365 client subscription.

The meeting coordinates (the Teams join link and dial-in numbers) will be added to the meeting invite after the user clicks **Send**.

Teams Meeting add-in in Outlook Web App

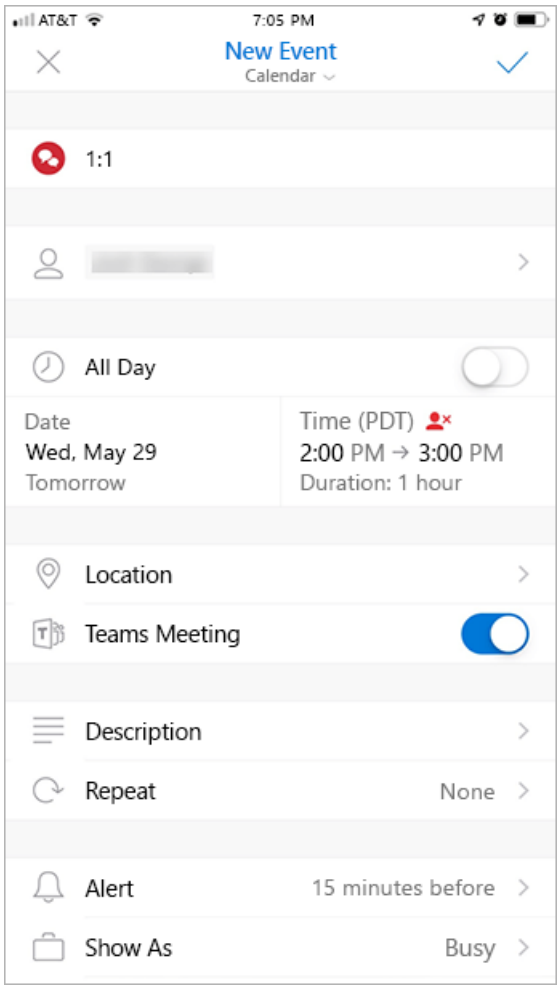
The Teams Meetings button in Outlook Web App will appear as part of new event creation if the user is on an early version of the new Outlook on the web. See the Outlook Blog to learn about how users can try the early version of the new Outlook on the web.



The meeting coordinates (the Teams join link and dial-in numbers) will be added to the meeting invite after the user clicks **Send**.

Teams Meeting add-in in Outlook mobile (iOS and Android)

The Teams Meeting button shows up in latest builds of the Outlook iOS and Android app.



The meeting coordinates (the Teams join link and dial-in numbers) will be added to the meeting invite after the user clicks **Send**.

Teams Meeting add-in and FindTime for Outlook

FindTime is an add-in for Outlook that helps users reach consensus on a meeting time across companies. Once the

meeting invitees have provided their preferred times, FindTime sends out the meeting invite on the user's behalf. If the **Online meeting** option is selected in FindTime, FindTime will schedule a Skype for Business or Microsoft Teams meeting. (FindTime will use whichever has been set by your organization as the default online meeting channel.)

> **NOTE**
> If you saved a Skype for Business setting in your Findtime dashboard, FindTime will use that instead of Microsoft Teams. If you want to use Microsoft Teams, delete the Skype for Business setting in your dashboard.

For more information, see Schedule meetings with FindTime.

Authentication requirements

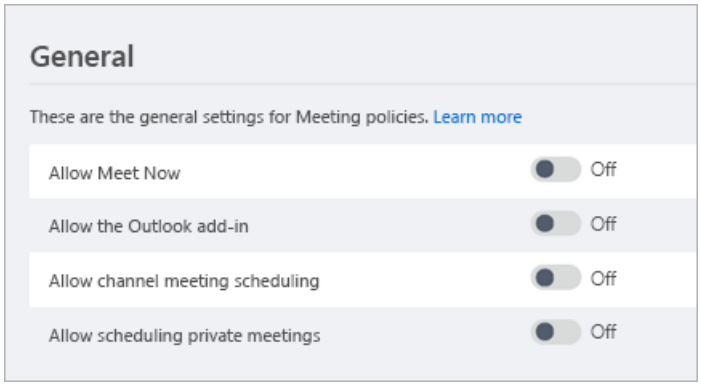
The Teams Meeting add-in requires users to sign in to Teams using Modern Authentication. If users do not use this method to sign in, they'll still be able to use the Teams client, but will be unable to schedule Teams online meetings using the Outlook add-in. You can fix this by doing one of the following:

- If Modern Authentication is not configured for your organization, you should configure Modern Authentication.
- If Modern Authentication is configured, but they canceled out on the dialog box, you should instruct users to sign in again using multi-factor authentication.

To learn more about how to configure authentication, see Identity models and authentication in Microsoft Teams.

Enable private meetings

Allow scheduling for private meetings must be enabled in the Microsoft Teams admin center for the add-in to get deployed. In the admin center, go to **Meetings** > **Meeting Policies**, and in the **General** section, toggle **Allow scheduling private meetings** to On.)



The Teams client installs the correct add-in by determining if users need the 32-bit or 64-bit version.

> **NOTE**
> Users might need to restart Outlook after an installation or upgrade of Teams to get the latest add-in.

Teams upgrade policy and the Teams Meeting add-in for Outlook

Customers can choose their upgrade journey from Skype for Business to Teams. Tenant admins can use the Teams co-existence mode to define this journey for their users. Tenant admins have the option to enable users to use Teams alongside Skype for Business (Islands mode).

When users who are in Island mode schedule a meeting in Outlook, they typically expect to be able to choose

whether to schedule a Skype for Business or a Teams meeting. In Outlook on the web, Outlook Windows, and Outlook Mac, users see both Skype for Business and Teams add-ins when in Islands mode by default. You can configure a Teams meeting policy setting to control whether users in Islands mode can only use the Teams Meeting add-in or both the Teams Meeting and Skype for Business Meeting add-ins.

Due to certain limitations in the initial release, Outlook mobile can only support creating Skype for Business **or** Teams meetings. See the following table for details.

COEXISTENCE MODE IN THE TEAMS ADMIN CENTER	DEFAULT MEETINGS PROVIDER IN OUTLOOK MOBILE
Islands	Skype for Business
Skype for Business only	Skype for Business
Skype for Business with Teams collaboration	Skype for Business
Skype for Business with Teams collaboration and meetings	Teams
Teams only	Teams

Set whether users in Islands mode can only use the Teams Meeting add-in or both the Teams Meeting and Skype for Business Meeting add-ins

As an admin, you can configure a Teams meeting policy setting to control which Outlook meeting add-in is used for *users who are in Islands mode*. You can specify whether users can only use the Teams Meeting add-in or both the Teams Meeting and Skype for Business Meeting add-ins to schedule meetings in Outlook.

You can only apply this policy to users who are in Islands mode and have the **AllowOutlookAddIn** parameter set to **True** in their Teams meeting policy. For steps on how to set this policy, see set the meeting provider for users in Islands mode.

Other considerations

The Teams Meeting add-in is still building functionality, so be aware of the following:

- The Teams Meeting add-in requires an Exchange mailbox for the primary user scheduling the meeting. Ensure that you have at least one Exchange mailbox configured in your Outlook profile and use it to schedule Teams meetings with the add-in. For Exchange requirements, see How Exchange and Teams interact.
- The add-in is for scheduled meetings with specific participants, not for meetings in a channel. Channel meetings must be scheduled from within Teams.
- The add-in will not work if an Authentication Proxy is in the network path of the user's PC and Teams Services.
- Users can't schedule live events from within Outlook. Go to Teams to schedule live events. For more information, see What are Microsoft Teams live events?.

Learn more about meetings and calling in Microsoft Teams.

Troubleshooting

Use the following steps to troubleshoot issues with the Teams Meeting add-in.

Teams Meeting add-in in Outlook for Windows does not show

If you cannot get the Teams Meeting add-in for Outlook to install, try these troubleshooting steps.

Download and run the Microsoft Support Recovery Assistant to perform automated troubleshooting steps and fixes.

Alternatively, perform the following steps manually:

- Windows 7 users must install the Update for Universal C Runtime in Windows for the Teams Meeting add-in to work.
- Check that the user has a Teams Upgrade policy which enables scheduling meetings in Teams. See Upgrade from Skype for Business to Teams for more details.
- Check that the user has a Teams Meeting policy that permits the Outlook Add-in. See Manage meeting policies in Teams for more details.
- Ensure the user has the Teams desktop client installed. The meeting add-in will not be installed when only using the Teams web client.
- Ensure the user has Outlook 2013 or later installed.
- Make sure the user has permission to execute regsvr32.exe.
- Ensure that all available updates for Outlook desktop client have been applied.
- Follow these steps:
  - Restart the Teams desktop client.
  - Sign out and then sign back in to the Teams desktop client.
  - Restart the Outlook desktop client. (Make sure Outlook isn't running in admin mode.)

If you still don't see the add-in, make sure that it isn't disabled in Outlook.

- In Outlook, choose **File** and then **Options**.
- Select the **Add-ins** tab of **Outlook Options** dialog box.
- Confirm that **Microsoft Teams Meeting Add-in for Microsoft Office** is listed in the **Active Application Add-ins** list
- If the Teams Meeting Add-in is listed in the **Disabled Application Add-ins** list, select **COM Add-ins** in **Manage** and then select **Go...**
- Set the checkbox next to **Microsoft Teams Meeting Add-in for Microsoft Office**.
- Choose **OK** on all dialog boxes and restart Outlook.

For general guidance about how to manage add-ins, see View, manage, and install add-ins in Office programs.

If the add-in still does not show, use the following steps to verify the registry settings.

> **NOTE**
> Incorrectly editing the registry may severely damage your system. Before making changes to the registry, you should back up any valued data on the computer.

- Launch RegEdit.exe
- Navigate to HKEY_CURRENT_USER\Software\Microsoft\Office\Outlook\Addins
- Verify TeamsAddin.FastConnect exists.
- Within TeamsAddin.FastConnect, verify LoadBehavior exists and is set to 3.
  - If LoadBehavior has a value other than 3, change it to 3 and restart Outlook.

Delegate scheduling does not work

If your administrator has configured Microsoft Exchange to control access to Exchange Web Server (EWS), a delegate won't be able to schedule a Teams meeting on behalf of the boss. The solution for this configuration is under development and will be released in the future. As a workaround, your administrator can add the following string to the EWS Allow List: "*SchedulingService*".

Related topics

Set up the Call me feature for your users

7/14/2020 • 2 minutes to read • Edit Online

In Microsoft Teams, the **Call me** feature gives users a way to join the audio portion of a meeting by phone. This is handy in scenarios when using a computer for audio might not be possible. Users get the audio portion of the meeting through their cell phone or land line and the content portion of the meeting—such as when another meeting participant shares their screen or plays a video—through their computer.

> **IMPORTANT**
>
> During periods of high meeting volume (which we've been experiencing in conjunction with the COVID-19 outbreak), we recommend that users join meetings by clicking the **Join Teams Meeting** button rather than dialing in by using the PSTN conference numbers or by using **Call me at**. This helps ensure quality audio during times when high meeting volume is causing congestion on the PSTN network.

> **IMPORTANT**
>
> During the duration of the COVID-19 outbreak, we recommend that users join meetings by clicking the **Join Teams Meeting** button rather than dialing in by using the PSTN conference numbers or by using **Call me at**. This is primarily because of congestion in the telephony infrastructures of countries impacted by COVID-19. By avoiding PSTN calls, you'll likely experience better audio quality.

The user experience

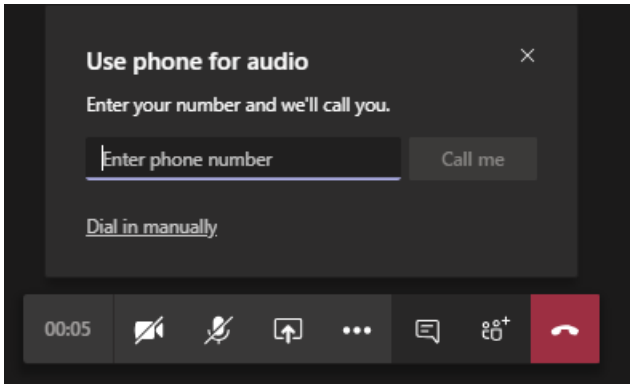
Join a meeting by using phone for audio

Click **Join** to join a meeting, and then click **Phone audio** on the **Choose your audio and video settings** screen. From here, users can have the meeting call and join them or dial in manually to the meeting.



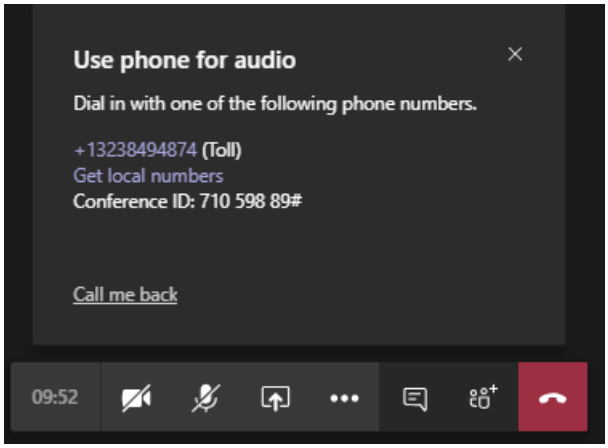
Let the Teams meeting call

On the **Use phone for audio** screen, the user enters their phone number, and then clicks **Call me**. The meeting calls the user and joins them to the meeting.



Dial in manually

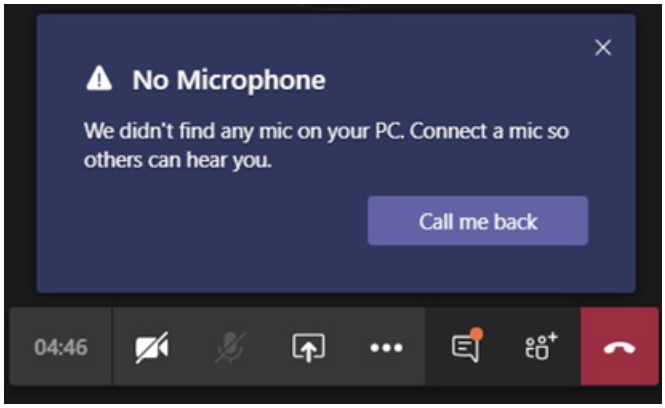
Another way to join is to dial in directly to the meeting. On the **Use phone for audio** screen, click **Dial in manually** to get a list of phone numbers to use to dial in to the meeting.



Get a call back when something goes wrong with audio during a meeting

If a user experiences audio issues when using their computer during a meeting, the user can easily switch to using their phone for audio. Teams detects when an audio or device issue occurs and redirects the user to use their phone by displaying a **Call me back** option.

Here's an example of the message and the **Call me back** option that's displayed when Teams doesn't detect a microphone.



The user clicks **Call me back**, which brings up the **Use phone for audio** screen. From here, they can enter their phone number and have the Teams meeting call and join them to the meeting or dial in manually to the meeting.

Set up the Call me feature

To enable the Call me feature for users in your organization, the following must be configured:

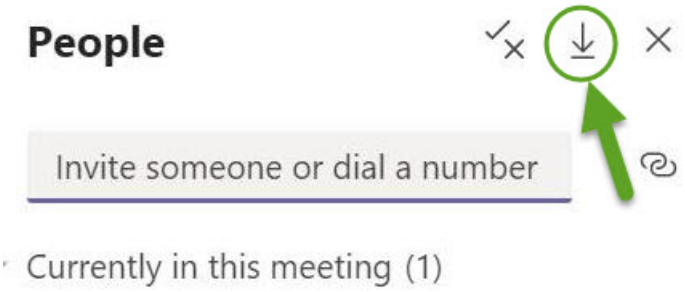
- Audio Conferencing is enabled for users in your organization who schedule meetings (meeting organizers). To learn more, see Set up Audio Conferencing for Teams and Manage the Audio Conferencing settings for a user in Teams.
- Users can dial out from meetings. To learn more, see Manage the Audio Conferencing settings for a user in Teams.

If a user doesn't have dial out from meetings enabled, the **Call me** option isn't available and the user won't receive a call to join them to the meeting. Instead, the user sees a list of phone numbers on the **Use phone for audio** screen that they can use to dial in manually to the meeting on their phone.

Microsoft Teams meeting attendance report

12/5/2020 • 2 minutes to read • Edit Online

Meeting organizers can view and download a meeting attendance report. Find this report in the **Participants** pane of the meeting, by clicking the download arrow as shown below. You can download the report as a .CSV file (text format).



For education tenants, this report is useful to track student attendance in online classes. For example, the teacher can download the attendance report at the start of class as a simple way to do a "roll call." To learn more, read Download attendance reports in Teams.

As an admin, you control whether meeting organizers can download meeting attendance reports by setting a Teams meeting policy. By default, the ability to download the report is turned off. For steps on how to turn on this feature, see Meeting policy settings - Meeting attendance report.

If meeting organizers need access to more meeting attendance data than they get from the report available within the meeting, you can assign the *Report reader* role so they can access the Teams admin reports themselves. To learn about this, read Who can access the Teams activity reports.

Related topics

- Teams analytics and reporting
- Teams usage report

Manage the Whiteboard in Microsoft Teams

4/27/2020 • 2 minutes to read • Edit Online

Microsoft Whiteboard is a free-form, digital canvas where people, content, and ideas come together. Whiteboard integration in Microsoft Teams meetings is powered by the Whiteboard web app, which lets Teams meeting participants draw, sketch, and write together on a shared digital canvas.

Users can share a whiteboard to make it available to all participants in a Teams meeting. That same whiteboard is simultaneously available in all the Whiteboard applications on Windows 10, iOS, and the web app.

To turn the Whiteboard app on or off, see Enable Microsoft Whiteboard for your organization. Keep in mind that this setting will enable or disable Whiteboard for your entire organization, and not just for Teams.

Whiteboard on Surface Hub

Before trying to use Microsoft Whiteboard, make sure that the Whiteboard app is installed on your Surface Hub device. If Whiteboard isn't installed, on the Surface Hub device, go to the Microsoft Store app, and get Microsoft Whiteboard. For more information, see Enable Microsoft Whiteboard on Surface Hub.

More information

For more information, see:

- Use Whiteboard in Microsoft Teams
- Enable Microsoft Whiteboard for your organization
- Enable Microsoft Whiteboard on Surface Hub

Set up Microsoft Teams meeting add-on for Google Workspace

12/5/2020 • 2 minutes to read • Edit Online

Using the Microsoft Teams meeting add-on lets Google calendar users schedule and join a Microsoft Teams meeting directly from Google Workspace. Users will get access to Teams meetings features including video and audio conferencing, screen sharing, meeting chat, digital whiteboards, and more. Stay connected and organized to get more done together across work, school, and life.

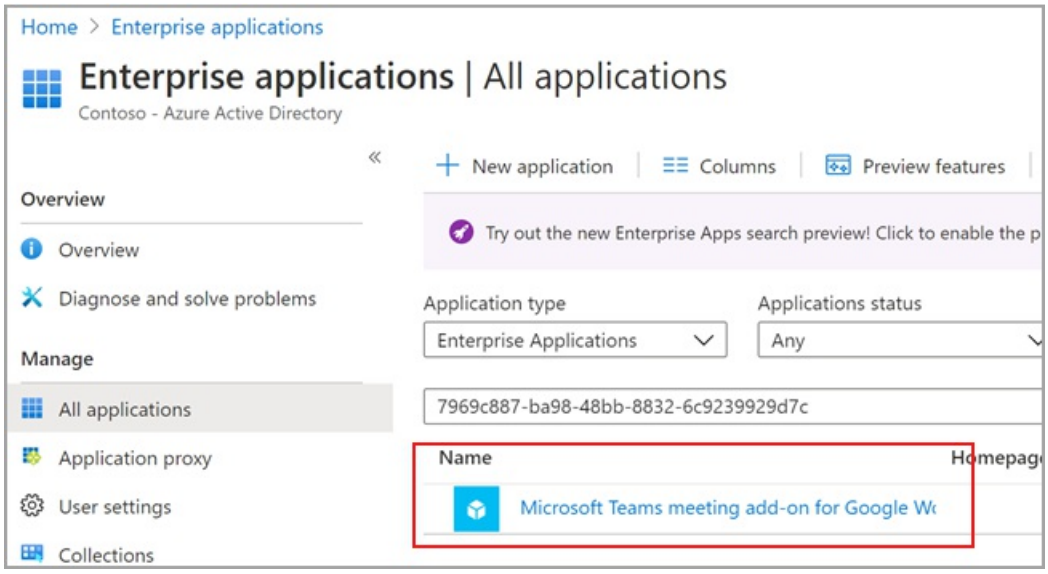
The Microsoft Teams meeting add-on for Google Workspace must be enabled by a Teams admin before tenant users can access the app.

Enable or disable Microsoft Teams meeting add-on for Google Workspace in the Azure portal

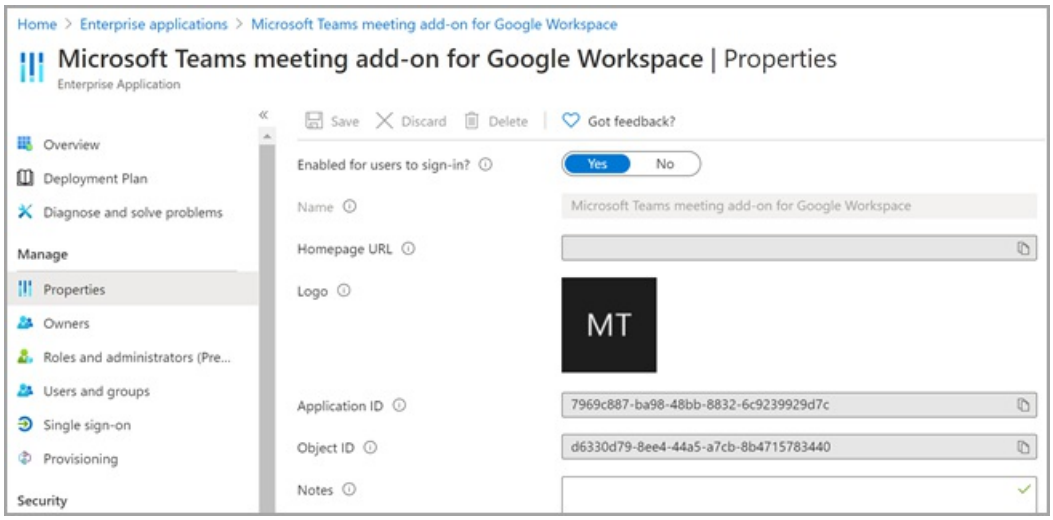
As a tenant administrator, you can enable or disable a Microsoft Teams meeting add-on for Google Workspace from your organization's admin account using the Azure portal.

The add-on is enabled by default.

1. Sign in to the Azure portal.
2. Select **Enterprise applications** > **All applications**.
3. Search for **Microsoft Teams meeting add-on for Google Workspace**.



4. Select **Yes**.



5. (Optional) To disable the add-on, select **No** instead of **Yes** in Step 4.

Disable Microsoft Teams meeting add-on for Google Workspace using PowerShell

```
Connect-AzureAD

$displayName = 'Microsoft Teams meeting add-on for Google Workspace'
$appId = '7969c887-ba98-48bb-8832-6c9239929d7c'

# Check if a service principal already exists for the app
$servicePrincipal = Get-AzureADServicePrincipal -Filter "appId eq '$appId'"
if ($servicePrincipal) {
    # Service principal exists already, disable it
    Set-AzureADServicePrincipal -ObjectId $servicePrincipal.ObjectId -AccountEnabled $false
    Write-Host "Disabled existing Service Principal \n"
} else {
    # Service principal does not yet exist, create it and disable it at the same time
    New-AzureADServicePrincipal -AppId $appId -DisplayName $displayName
    $servicePrincipal = New-AzureADServicePrincipal -AppId $appId -DisplayName $displayName -AccountEnabled
$false
    Write-Host "Created and disabled the Service Principal \n"
}
```

For more information, see Create an Azure service principal with Azure PowerShell.

Delete the Microsoft Teams meeting add-on for Google Workspace

See the Google documentation Delete a Google Workspace Marketplace app for instructions.

Learn how to deploy audio conferencing in Microsoft Teams

12/5/2020 • 6 minutes to read • Edit Online

Audio Conferencing is the ability to join a Teams meeting from a regular phone and dial out from a meeting to a phone number. Be sure you've reviewed Meetings rollout as part of rolling out Audio Conferencing in your organization.

Audio Conferencing deployment decisions

This article helps you decide whether to change any of the default Audio Conferencing settings, based on your organization's profile and business requirements, then it walks you through each change. We've split the settings into two groups, starting with the core set of changes you're more likely to make. The second group includes the additional settings you may want to configure, based on your organization's needs.

You only need to set up Audio Conferencing for people who plan to schedule or lead meetings. Meeting attendees who dial in don't need any licenses assigned to them or any other setup. Dialing in (calling in) to meetings is very useful for users who are on the road and can't attend a meeting using the Skype for Business or Teams app on their laptops or mobile devices.

Audio Conferencing prerequisites

Before you can roll out Audio Conferencing for Teams, consider the following:

ASK YOURSELF	ACTION
Is Audio Conferencing available for my country/region?	To find out if Audio Conferencing is available for your country/region, see Country and region availability for Audio Conferencing and Calling Plans.
Do my users have the proper licensing for Teams Audio Conferencing?	Audio Conferencing licenses are available as part of a Microsoft 365 or Office 365 E5 subscription or as an add-on service for a Microsoft 365 Business Standard, E1, or E3 subscription. • To get and assign licenses, see Try or purchase Audio Conferencing in Microsoft 365 or Office 365 and Assign or remove licenses for Microsoft 365 Apps for business. • To learn more, read Microsoft Teams add-on licensing. • To see what cloud features are included in each plan, see the License options based on your plan articles.
Do I need to purchase Communications Credits for the users who are assigned Audio Conferencing licenses?	To learn more, read What are Communications Credits, then check out the Communications Credits section below.

Core deployment decisions

After you meet the Audio Conferencing prerequisites, complete the following tasks to configure Audio Conferencing for your users.

Teams administrators

Teams provides a set of custom administrator roles that can be used to manage Teams for your organization. The roles provide various capabilities to administrators.

ASK YOURSELF	ACTION
Who will be assigned the Teams Communications Administrator role?	To learn more about Teams administrator roles see Use Microsoft Teams admin roles to manage Teams.
Who will be assigned the Teams Communications Support Engineer role?	To assign admin roles, see Assign administrator and non-administrator roles to users with Active Directory.
Who will be assigned the Teams Communications Support Specialist role?	

Conferencing bridges and phone numbers

Conferencing bridges let people dial into meetings using a phone. You can use the default settings for a conferencing bridge or change the phone numbers (toll and toll-free) and other settings, such as the PIN or the languages that are used.

See Audio Conferencing to learn more.

ASK YOURSELF	ACTION
Do I need to add new conferencing bridge numbers?	To add new numbers, see Getting service phone numbers.
Will I need to modify the bridge settings?	To modify the bridge settings, see Change the settings for an Audio Conferencing bridge.
Do I need to port numbers to use with audio conferencing?	To learn about porting phone numbers, read Transfer phone numbers to Teams.

Default and alternate languages

Teams Audio Conferencing lets you set up default and alternate languages for a conferencing bridge.

ASK YOURSELF	ACTION
Which languages should I choose for auto attendant greetings?	To choose languages, see Set auto attendant languages for Audio Conferencing.

Conferencing bridge settings

After setting up your conferencing bridge, including default and alternate languages, you should verify that the default settings such as entry/exit notifications and PIN length are the ones you want to use. If they're not, you can change them.

ASK YOURSELF	ACTION
Will attendees hear a notification when a user joins or exits a meeting?	To change these settings, see Change the settings for an Audio Conferencing bridge.

ASK YOURSELF	ACTION
What is the required length of the PIN that a meeting organizer uses to start the meeting?	

Dial-in phone number settings for users who lead meetings

After you create your Audio Conferencing bridge, you need to set the toll and/or toll-free numbers that users who lead meetings will use.

ASK YOURSELF	ACTION
Which conference bridge numbers will I assign to each user who leads meetings?	To assign a dial-in phone number to a user, see Step 7: Assign dial-in phone numbers for users who lead meetings.

Communications Credits

To provide toll-free conference bridge phone numbers and to support conferencing dial-out to international phone numbers, you must set up Communications Credits for your organization. To learn more about Communications Credits, see What are Communications Credits?.

ASK YOURSELF	ACTION
Are Communications Credits required for my Audio Conferencing implementation?	To find out if you need to set up Communications Credits, see Set up Communications Credits for your organization.
If they're required, how much should I purchase?	To determine the Communications Credits amount, see Recommended funding amounts.
Do I want to configure an auto-recharge amount?	To configure an auto-recharge amount, see Set up Communications Credits for your organization.

Additional deployment decisions

You may want to change these settings, based on your organization's needs and configuration.

Outbound calling restriction policies

As an administrator, you can use outbound call controls to restrict the type of audio conferencing and end user PSTN calls that can be made by users in your organization.

ASK YOURSELF	ACTION
Will I limit the type of outbound calls that are allowed?	To restrict outbound calls, see Outbound calling restriction policies for Audio Conferencing and user PSTN calls.

Dial plans

A dial plan, as part of Phone System in Microsoft 365 or Office 365, is a set of normalization rules that translate dialed phone numbers into an alternate format (typically E.164 format) for call authorization and call routing.

For more information about dial plans, see What are dial plans?

ASK YOURSELF	ACTION
Does my organization need a customized dial plan?	To help determine if you need a custom dial plan, see Planning for tenant dial plans.
Which users require a customized dial plan, and which tenant dial plan should be assigned to each user?	To add users to a customized dial plan using PowerShell, see Create and manage dial plans.

Troubleshoot meeting and call quality

Teams gives you two ways to monitor and troubleshoot call quality problems: Call Analytics and Call Quality Dashboard. Call Analytics shows detailed information about the devices, networks, and connectivity related to the specific calls and meetings for each user. Call Analytics is designed to help admins and helpdesk agents troubleshoot call quality problems with specific calls, whereas the Call Quality Dashboard is designed to help admins and network engineers optimize a network. Call Quality Dashboard shifts focus from specific users and instead looks at aggregate information for an entire Teams organization.

ASK YOURSELF	ACTION
Who will be responsible for monitoring and troubleshooting call quality issues?	See Use Call Analytics to troubleshoot poor call quality for information about permission levels required to troubleshoot call quality issues.

Next steps

- Drive adoption of audio conferencing in your organization.
- Roll out cloud voice
- Include featured apps - such as Planner - in your initial Teams rollout. Add other apps, bots, & connectors as you drive Teams adoption.

Audio Conferencing in Microsoft 365

12/5/2020 • 5 minutes to read • Edit Online

Audio Conferencing in Microsoft 365 and Office 365 enables users to call in to meetings from their phones. Audio Conferencing allows up to 250 phone attendees.

What is Audio Conferencing?

Calling in (dialing in) to meetings is very useful for users who are on the road and can't attend a meeting using the Skype for Business or Microsoft Teams app on their laptops or mobile devices. But there are other scenarios in which using a phone to attend a Skype for Business or Microsoft Teams meeting can be a better option than using an app on a computer:

- Internet connectivity is limited.
- A meeting is audio only.
- The person tried to join a Skype for Business meeting and it failed.
- The call quality is better when dialing in.
- People can join a meeting "hands free" using Bluetooth devices.
- People find it's easier and more convenient for their situation.

You only need to set up Audio Conferencing for people who plan to schedule or lead meetings. Meeting attendees who dial in don't need any licenses assigned to them or other setup.

After attendees have joined meeting, they can also dial out and invite other callers into a Skype for Business or Microsoft Teams meeting. See Dialing out from a Teams meeting so other people can join it or Dialing out from a Skype for Business meeting so other people can join it.

What does it cost?

For pricing info, see Pricing for Audio Conferencing.

Where is it available?

With Audio Conferencing, your users can use toll and toll-free phone numbers to dial in to meetings. Toll (service) numbers are automatically assigned as shared audio conferencing numbers to organizations when they're enabled for Audio Conferencing. Dedicated toll and toll-free numbers can be assigned to your organization from additional cities.

Toll-free phone numbers (service numbers) are available, but only in some countries/regions. To see what is available in your country or region, see Country and region availability for Audio Conferencing and Calling Plans.

After you have decided you want Audio Conferencing for your organization, you need to buy one **Audio Conferencing** license for each person in your organization who is going to schedule/host an audio meeting.

How do conferencing bridges work?

When you are setting up Audio Conferencing for Skype for Business or Microsoft Teams, you will get an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers. The phone number you set will be included on the meeting invites for Skype for Business and Microsoft Teams apps. You can change the phone numbers on your conferencing bridge, and you can also change other audio conferencing bridge settings.

The audio conferencing bridge answers a call for people who are dialing in to a meeting using a phone. It answers the caller with voice prompts from an auto attendant, and then, depending on your settings, can play notifications and ask callers to record their name. **Microsoft bridge settings** allow you to change the settings for meeting notifications and the meeting join experience, and set the length of the PINs that are used by meeting organizers in Microsoft Teams or in Skype for Business Online. Meeting organizers use PINs to start meetings if they can't join the meeting using the Skype for Business or Microsoft Teams app.

Dial-in phone numbers set on an audio conferencing bridge

There are two types of audio conferencing phone numbers that can be assigned to your conferencing bridge: **Shared** and **Dedicated**. Both types of numbers can be used by any caller to join audio meetings that are being held in your organization.

Dedicated phone numbers are those phone numbers that are only available to users within your organization. You can change the languages that are used when someone calls in to one of these numbers. You will need to get a service phone number for these.

Shared phone numbers are those phone numbers that can be shared with other Microsoft 365 or Office 365s. You can't change the languages that are used when someone calls in to one of these numbers.

While the default audio conferencing number that is assigned to an organizer is only included in the meeting invite, a caller can use any of the phone numbers that are assigned to your conferencing bridge to join a meeting. The list of phone numbers that can be used to join a meeting is available using the **Find a local number** link that is included on every meeting invite.

For more information, see Phone numbers for Audio Conferencing in Microsoft Teams or Phone numbers for Audio Conferencing in Skype for Business Online.

Automatically assigned audio conferencing phone numbers

Shared audio conferencing phone numbers are automatically assigned to organizations when they're enabled for audio conferencing. When the phone numbers are assigned, a phone number is assigned as the default phone number of the conferencing bridge. The phone number assigned as the default number of the bridge will be one from the country/region of the organization.

> **NOTE**
> The country or region location of your organization can be found by signing in to the **Microsoft 365 admin center** and looking under **Organization Profile**.

Caution

Due to limited availability of toll phone numbers in Venezuela, Indonesia, and United Arab Emirates (UAE), organizations from these countries/regions won't have an Audio Conferencing toll number automatically assigned to them. Toll-free numbers from these locations are available depending on available inventory.

To see a list of those countries/regions that have phone numbers automatically assigned to organizations, see Country and region availability for Audio Conferencing and Calling Plans.

How do you get dedicated phone numbers?

Dedicated audio conferencing phone numbers are service numbers that you can get and then assign to your organization. You can get dedicated toll and toll-free phone numbers for your conferencing bridges in one of three ways:

- **Use the Skype for Business admin center.** For some countries/regions, you can get numbers for your

conference bridges using the Skype for Business admin center. See Getting service phone numbers.

- **Port your existing numbers.** You can port or transfer existing numbers from your current service provider or phone carrier to Microsoft 365 or Office 365. See Transfer phone numbers to Teams or Manage phone numbers for your organization for more information to help you do this.
- **Use a request form for new numbers.** Sometimes (depending on your country/region) you won't be able to get your new phone numbers using the Skype for Business admin center, or you will need specific phone numbers or area codes. If so, you will need to download a form and send it back to us. See Manage phone numbers for your organization for more information.

How do you set it up?

After you have decided to set up Audio Conferencing for your users, see Set up Audio Conferencing for Microsoft Teams or Set up Audio Conferencing for Skype for Business Online for steps you can follow to do so.

Related topics

Set up Skype for Business Online

Phone numbers for Audio Conferencing in Microsoft Teams

Phone numbers for Audio Conferencing in Skype for Business Online

Open Preview of On-network Conferencing for Audio Conferencing

12/5/2020 • 6 minutes to read • Edit Online

The Open Preview of On-network Conferencing is available to all customers. On-network Conferencing allows organizations to send inbound and outbound Audio Conferencing calls to Microsoft dial-in numbers through Direct Routing. This capability is not intended to extend the support of Audio Conferencing to third party dial-in numbers. On-network Conferencing is not supported if it is used to route inbound calls to the Audio Conferencing service through third party dial-in phone numbers.

This article describes the prerequisites and configuration steps required to enable On-network Conferencing for your organization.

> **IMPORTANT**
> On-network Conferencing must NOT be deployed with any telephony equipment in India.

Prerequisites

Before configuring On-network Conferencing, make sure your organization meets the following prerequisites:

- Ensure that all users in your organization who are enabled, or will be enabled, for Audio Conferencing are using Teams for all Meetings. The routing of inbound and outbound Audio Conferencing calls through On-network Conferencing is only supported for Teams meetings.
- Assign Audio Conferencing licenses to all users who will be using On-network Conferencing.
- Set up the Audio Conferencing service. For additional information, see Set up Audio Conferencing for Microsoft Teams.
- Set up your Session Border Controller (SBC) for Direct Routing. For additional information, see Plan Direct Routing and Configure Direct Routing.

  If you are setting up Direct Routing only for the purposes of Audio Conferencing, then you need only complete "Step 1: Connect your SBC" for On-network Conferencing.

Enable the routing of dial-in calls to Microsoft Audio Conferencing through Direct Routing

To route dial-in calls made by your on-premises users to the Audio Conferencing service through Direct Routing, you need to configure appropriate routing rules for your SBCs and Private Branch Exchange(s) (PBXs).

You need to configure the telephony equipment of your sites to route calls to any service number of the conference bridge of your organization through a Direct Routing trunk.

You can find the service numbers in Teams admin center under **Meetings -> Conferencing Bridges** or by using the Skype for Business Online PowerShell cmdlet Get-CsOnlineDialInConferencingBridge. For additional information, see a list of Audio Conferencing numbers in Microsoft Teams.

> **NOTE**
> This feature is not available to users with the pay-per-minute Audio Conferencing license.

Enable the routing of Teams meeting dial-out calls through Direct Routing

Teams meeting dial-out calls are initiated from within a meeting in your organization to PSTN numbers, including call-me-at calls and calls to bring new participants to a meeting.

To enable Teams meeting dial-out routing through Direct Routing to on-network users, you need to create and assign an Audio Conferencing routing policy called "OnlineAudioConferencingRoutingPolicy".

The OnlineAudioConferencingRoutingPolicy policy is equivalent to the CsOnlineVoiceRoutingPolicy for 1:1 PSTN calls via Direct Routing. The OnlineAudioConferencingRoutingPolicy policy can be managed by using the following cmdlets:

- New-CsOnlineAudioConferencingRoutingPolicy
- Set-CsOnlineAudioConferencingRoutingPolicy
- Get-CsOnlineAudioConferencingRoutingPolicy
- Grant-CsOnlineAudioConferencingRoutingPolicy
- Remove-CsOnlineAudioConferencingRoutingPolicy

For more information about routing for Direct Routing, see Configure voice routing for Direct Routing.

To enable the routing of meeting dial-out calls through Direct Routing, you need to:

- Configure Audio Conferencing routing policies
- Configure the routing on the telephony equipment of your organization
- (Optional) Configure a dial plan

Dial-out calls from Teams meetings are coming from the default service number on the conference bridge. For additional information on the default service number of your Audio Conferencing bridge, see Change the phone numbers on your Audio Conferencing bridge.

Configure Audio Conferencing routing policies

The Audio Conferencing routing policy OnlineAudioConferencingRoutingPolicy determines which meeting dial-out calls are routed to Direct Routing trunks. If you are familiar with the CsOnlineVoiceRoutingPolicy policy, this policy works in a very similar way.

The following steps are needed to set up Audio Conferencing routing policies:

1. Create PSTN usages
2. Configure voice routes
3. Create Audio Conferencing voice routing policies
4. Assign a policy to your users

Create PSTN usages

PSTN usages are collections of voice routes. When a dial-out call is initiated from the meeting of a given organizer, voice routes will be used to determine the routing path of the call based on the PSTN usages that are associated to the user via the user's voice routing policy.

You can create a PSTN usage by using the "Set-CsOnlinePstnUsage" cmdlet. For Example:

```
Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="US and Canada"}
```

Configure voice routes

Voice routes determine the PSTN gateway that should be used to route a call based on the phone number that is dialed from a Teams meeting. Voice routes determine the PSTN gateway that should be used to route a given call by matching the phone number dialed from a Teams meeting with a regex pattern. When creating a voice route, the route must be associated to one or more PSTN usages.

You can create a voice route and define the regex and gateways to be associated with the voice route by using the "New-CsOnlineVoiceRoute" cmdlet. For Example:

```
New-CsOnlineVoiceRoute -Identity "Redmond 1" -NumberPattern "^\+1(425|206)(\d{7})$" -OnlinePstnGatewayList
sbc1.contoso.biz, sbc2.contoso.biz -Priority 1 -OnlinePstnUsages "US and Canada"
```

Create Audio Conferencing voice routing policies

Audio Conferencing voice routing policies determine the possible routes that can be used to route a call originating from the meetings of an organizer based on the target phone number of the meeting dial-out call. Audio Conferencing voice routing policies are associated to one or more PSTN usages, which in turn, determine the possible routes that will be attempted to be used for the meeting dial-out calls of the organizers associated to the policy.

You can create an Audio Conferencing voice routing policy by using the "New-CsOnlineAudioConferencingRoutingPolicy" cmdlet. For Example:

```
New-CsOnlineAudioConferencingRoutingPolicy "Policy 1" -OnlinePstnUsages "US and Canada"
```

After the policy is assigned to a user, and when a meeting dial-out call is initiated from one of the user's meetings, the voice routes in the PSTN usages that are associated to the organizer through the user's voice routing policy will be evaluated. If the meeting dial-out call destination matches a regex in one of the voice routes that are associated to the organizer, the meeting dial-out call will be routed to the PSTN gateway defined in the voice route. If the meeting dial-out call destination does not match any of the voice routes associated to the organizer, the meeting dial-out call will be routed by Microsoft.

Assign a policy to your users

After the Audio Conferencing routing policies are defined, you can now assign them to users. After policies are assigned to them, the meeting dial-out calls will be evaluated against it to determine their routing path. Audio Conferencing routing policies are always evaluated based on the organizer of the meeting, independently from the user in the meeting that initiates a meeting dial-out call.

You can assign an Audio Conferencing voice routing policy to a user by using the "Grant-CsOnlineAudioConferencingRoutingPolicy" cmdlet. For example:

```
Grant-CsOnlineAudioConferencingRoutingPolicy -Identity "<User Identity>" -PolicyName "Policy 1"
```

Configure routing on the telephony equipment of your organization

On the telephony equipment of your organization, you need to ensure that the meeting dial-out calls routed through Direct Routing are routed to the intended on-network destination.

(Optional) Configure a dial plan

A dial plan is a set of normalization rules that translate dialed phone numbers by an individual user into an alternate format (typically E.164) for purposes of call authorization and call routing.

By default, Teams users can dial-out to PSTN numbers in E.164 format, that is, +<country code><number>.

However, dial plans can be used to allow users to dial phone numbers in other formats, for instance 4-digit extensions.

If you would like to enable extension-based dialing through On-network conferencing, you can set up dial plans to match the extension dialing pattern to the phone number ranges of the phone number of your organization. To set up dial plans, see Create and manage dial plans.

Known issues in Open Preview

The following is a list of known issues that are currently present in the Open Preview release of On-network conferencing. Microsoft is working on addressing these issues.

ISSUE	WORKAROUND
Dial-in calls with anonymous/hidden caller IDs that are routed through On-network conferencing cannot be connected to the meeting.	If possible, set a configuration in your PBX or SBC to always send a caller ID for calls routed via On-network conferencing.
In some cases, the welcome message that is played to users when they dial in to the service ("Welcome to the Audio Conferencing service...") is truncated and users do not hear the "Welcome" word.	There are no workarounds for this issue at the moment.

Related topics

Audio Conferencing common questions

9/23/2020 • 7 minutes to read • Edit Online

The following are some of the top questions we get from our customers who want to use Audio Conferencing.

What are the benefits of Audio Conferencing?

Calling in to meetings is beneficial when people are on the road, for example, and can't attend a meeting using the Skype for Business or Microsoft Teams app on their laptop or mobile devices. But there are other scenarios in which using a phone to attend a Skype for Business or Microsoft Teams meeting can be a better option than using an app on a computer:

- Internet connectivity is limited.
- A meeting is audio only.
- The person tried to join a Skype for Business meeting and it failed.
- The call quality is better if they dial in.
- People can join a meeting "hands free" using Bluetooth devices.
- People find it's easier and more convenient for their situation.

Who can attend an Audio Conferencing meeting? And who can I hear?

Anyone who has the dial-in number and conference ID can join a Skype for Business or Microsoft Teams meeting, unless the meeting organizer has locked the meeting.

Whether you're calling in using a phone or the Skype for Business or Microsoft Teams apps, you'll be able to hear everyone else on the call, and they can hear you. The meeting organizer has the ability to "mute" meeting attendees if they don't want to hear them.

Can I add a toll-free number for my Audio Conferencing users?

Yes, toll-free phone numbers (service numbers) are available but only in some countries/regions. For a list of the numbers that are available, see Country and region availability for Audio Conferencing and Calling Plans.

How many local dial-in numbers are currently supported?

There are local dial-in numbers that are assigned to you when you purchase the licenses for Audio Conferencing. The dial-in numbers will be included in the meeting invite. These local numbers will be only available to your organization. The phone assigned to your organization and that number is shared by the users within that organization that are enabled for Audio Conferencing. So, Skype for Business or Microsoft Teams meetings scheduled by User A and another User B will both have the same dial-in number.

Local dial-in numbers, and also in some cases international dial-in numbers from the country where your organization is located, will be included on the meeting invite. If a meeting attendee uses a different number that is included in the invite, it will be a shared phone number.

How many international dial-in numbers does Audio Conferencing in Microsoft 365 or Office 365 support?

For a current list of countries/regions, see Phone numbers for Audio Conferencing in Microsoft Teams or Phone numbers for Audio Conferencing in Skype for Business Online.

Can I set up local numbers for Audio Conferencing from additional cities in the country?

If phone numbers for Audio Conferencing aren't available in your area or don't meet the needs of your organization, send us feedback at SkypeFeedback forums.

What is the maximum length of the Audio Conferencing meetings?

The maximum length of time depends on who is in the meeting and the type of authentication they used to join the meeting.

MEETING ATTENDEES	MEETING END TIME
Users have joined using the Skype for Business or Microsoft Teams app or have dialed in to the meeting.	The meeting ends if there are no changes to the attendee list after 24 hours.
All of the users are dialed in to the meeting but someone has used a PIN to enter the meeting.	The meeting ends after 24 hours.
All of the users are dialed in to the meeting but there wasn't anyone who used a PIN to enter the meeting.	If anonymous users are allowed to start meetings, the meeting ends after four hours. If anonymous users aren't allowed to start meetings and all authenticated participants have left the meeting, the meeting ends 90 minutes after the last authenticated participant left.

How many total phone participants can I have in meetings?

See Limits and Specifications for total number of attendees allowed in meetings.

To find out about meeting limits, see Skype for Business Online Limits.

Why did users start receiving emails with their Audio Conferencing information?

We added a new feature that allows you, the admin, to send and update Audio Conferencing information and PIN in email. To learn more about it, including how to disable it, see Enable or disable sending emails when Audio Conferencing settings change in Microsoft Teams or Enable or disable sending emails when Audio Conferencing settings change in Skype for Business Online.

Can Audio Conferencing be used by the users who are part of an on-premises deployment of Skype for Business Server?

With Meetings First, Skype for Business Server users can benefit from Teams meetings and Teams Audio Conferencing.

Can a user get a personal conference ID?

Skype for Business and Microsoft Teams users will be randomly assigned conferencing IDs. Users can't reserve or set a static conference ID that only they can use.

Can I use Audio Conferencing with Skype Meeting Broadcast?

There isn't support currently for users enabled for Audio Conferencing to join a Skype Meeting Broadcast.

Can a user get operator assistance during a meeting?

No, a user can't get any operator assistance or support by pressing *0 during the meeting. If there are issues with Audio Conferencing, an administrator for an organization can contact Microsoft support for Office 365.

How does a user access or change their conference ID?

Skype for Business or Microsoft Teams users can find the conference ID that is assigned to them by scheduling a meeting in Outlook and Outlook on the web. Also, users can find the conference ID in the email that will be sent to them after they are set up.

> **NOTE**
> Users won't be able to reset their conference ID. The conference ID can only be reset by you, the admin, for the organization.

We are working on a solution that will let the user access and reset a conference ID without help from an organization's admin.

How do users access or change their PIN?

Skype for Business or Microsoft Teams users can find the PIN in an email that will be sent to them once they are set up.

> **NOTE**
> A Skype for Business or Microsoft Teams user won't be able to reset their PIN. The PIN can only be reset by you, the admin. When a PIN is reset, an email is sent to the user.

We are working on a solution that will let the user access and reset a PIN without help from an organization's administrator.

What in-meeting dial-pad commands are supported?

- *6 (Mute/unmute themselves)
- *1 (Plays the descriptions of dial-pad commands that are available)

Can attendees dial out to international phone numbers when they are in a Skype for Business or Microsoft Teams meeting?

Yes, attendees can dial out internationally and invite other callers into a Skype for Business or Microsoft Teams meeting. See Dialing out from a Microsoft Teams meeting so other people can join it or Dialing out from a Skype for Business Online meeting so other people can join it.

How does a Skype for Business or Microsoft Teams user schedule a meeting with Audio Conferencing meeting details?

When a user is assigned an **Audio Conferencing** license and the user creates a new Skype for Business or

Microsoft Teams meeting in Outlook or Outlook on the web, the dial-in phone numbers and conferencing IDs are added automatically to the meeting invite.

How does a user schedule and start a meeting when all attendees will be using a phone to dial in?

Scheduling a meeting that will be joined by all attendees using a phone to dial in is not different from scheduling a regular online meeting. However, there are two ways to start a meeting on which all of the participants use a phone to dial in:

- **Option #1**: By default, if the meeting organizer and all participants are joining a meeting using a phone, the meeting organizer needs to input her Audio Conferencing PIN to start it. Callers get asked if they want to authenticate as the organizer of a given meeting when they dial the phone number of an online meeting. All participants that join the meeting via dial-in before the organizer starts will be placed in the lobby and will listen to music on hold. For Skype for Business meetings, once the organizer starts it by inputting his or her Audio Conferencing PIN, all participants in the lobby will automatically join the meeting. For Microsoft Teams meetings, the participants will join the meeting according to the value of the automatically admit people setting in the organizer's meeting policy.
- **Option #2**: The "Allow unauthenticated callers to be the first people in a meeting" setting is disabled by default. If the setting is enabled for a given organizer, then all meetings scheduled by that organizer can be started before the organizer inputs the Audio Conferencing PIN. When this setting is enabled, the meeting will start as soon as the first participant joins it via a dial-in phone number, and the first participant won't be put in the lobby. For more information, see, Manage Audio Conferencing settings for a user in Microsoft Teams or Manage Audio Conferencing settings for a user in Skype for Business Online.

Related topics

Set up Skype for Business Online

Phone numbers for Audio Conferencing in Microsoft Teams

Phone numbers for Audio Conferencing in Skype for Business Online

Try or purchase Audio Conferencing in Microsoft 365 for Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

Sometimes people in your organization will need to use a phone to call in to a meeting. Microsoft Teams includes the Audio Conferencing feature for just this situation! People can call in to Microsoft Teams meetings using a phone, instead of using the Microsoft Teams app on a mobile device or PC.

You only need to set up audio conferencing for people who plan to schedule or lead meetings. Meeting attendees who call in to the meeting don't need any licenses assigned to them and don't need other setup.

For pricing info, see Pricing for Audio Conferencing.

Step 1: Buy and assign Audio Conferencing licenses

You must be a global administrator or billing administrator to perform these steps.

To buy and assign user Audio Conferencing licenses

1. Find out if **Audio Conferencing** is available in your country/region. Countries and region availability for Audio Conferencing and Calling Plans.
2. Get your **Audio Conferencing** licenses. If you want to:
   - **Try it** before you buy it: you can sign up for an Office 365 Enterprise E5 free trial that includes Audio Conferencing. See Office 365 Enterprise E5 Trial.
   - **Buy it**: see [Microsoft Teams add-on licensing]https://docs.microsoft.com/microsoftteams/teams-add-on-licensing/microsoft-teams-add-on-licensing).
3. Assign licenses to users in your organization who are going to schedule or lead meetings.
4. If you purchased audio conferencing add-on licenses and Communications Credits licenses, assign them too. For instructions, see Assign Microsoft Teams add-on licenses.

To buy and assign pay-per-minute Audio Conferencing licenses

If you're a Volume and Licensing customer, you can get pay-per-minute Audio Conferencing licenses. For additional information on pay-per-minute Audio Conferencing licenses, see Audio Conferencing pay-per-minute.

1. Find out if **Audio Conferencing** is available in your country/region. Country and region availability for Audio Conferencing and Calling Plans.
2. Get your **Audio Conferencing** licenses. To acquire pay-per-minute licenses, please contact your account representative.
3. Set up Communications Credits for your organization for your organization. To set up Communications Credits, see What are Communications Credits?

   > **IMPORTANT**
   > If Communications Credits haven't been set up, Audio Conferencing won't work for any users with pay-per-minute licenses.

4. Assign licenses to users in your organization who are going to schedule or lead meetings.

> **NOTE**
> If you have Audio Conferencing pay-per-minute licenses, you must assign a Communications Credits license separately to each user as well.

Step 2: Set the audio conferencing provider for people who lead or schedule meetings

When you assign an **Audio Conferencing** license to people in your organization who don't have Skype for Business integrated with a 3rd party audio conferencing provider, they are all set up and ready to go! (You don't have to set their audio conferencing provider.)

If you have users enabled with a 3rd party audio conferencing provider, you must change the provider of those users to Microsoft. To change the provider for a user, see Assign Microsoft as the audio conferencing provider.

Step 3: Other admin tasks

The following steps are **optional**, but a lot of admins like to do them:

1. Customize meeting invitations. The dial-in numbers that are set for the user will be automatically added to the meeting invitations that are sent to attendees. However, you can add your own help and legal links, a text message, and small company graphic.
2. Set the phone numbers included on invites. This is the phone number that will show up in the meeting that is scheduled by a user.
3. Set auto attendant languages for Audio Conferencing that the Audio Conferencing auto attendant uses to greet a caller when they dial in to an audio conferencing phone number. This step only applies if you're using Microsoft as your audio conferencing provider.
4. Set the length of the PIN for Audio Conferencing meetings.

> **NOTE**
> This feature is not yet available to customers using Office 365 operated by 21Vianet in China. To learn more, see Learn about Office 365 operated by 21Vianet.

Related topics

Enable Teams in your organization

Phone numbers for Audio Conferencing

Set options for online meetings and conference calls

Office 365 Audio Conferencing Extended Dial-out Minutes to US and Canada

9/16/2020 • 2 minutes to read • Edit Online

For customers who are adopting our Audio Conferencing service and have a high business need for dialing out to US and Canada, Microsoft now provides an add-on offer that allows virtually unlimited with fair use policy US and Canada dial-out minutes for any audio conferencing user. Meeting organizers with this add-on SKU can make virtually unlimited with fair use policy dial-out calls to US and Canada without deducting their tenant's Zone A country dial-out usage pool or Communications Credits. [1]

OFFER NAME	UNLIMITED DIAL-OUT MINUTES TO US CANADA
What are the unlimited dial-out countries included in the offer?	US and Canada.
Who needs to have the license assigned?	The meeting organizer needs to have the license assigned. The user initializing the call doesn't need to have the license.
Are there any prerequisites?	Audio Conferencing needs to be enabled. It can be either subscription or per-minute service.
Who can purchase this offer?	Any country or region where Audio Conferencing can be purchased. Read more.
Are the minutes pooled?	No. A meeting organizer will have virtually unlimited with fair use policy dial-out minutes to US/Canada per month.
Will this new add-on SKU replace the 60 minutes included with Audio Conferencing?	No. The existing Audio Conferencing 60 minutes per user per month, pooled at the tenant level, will continue to apply to all Zone A dial-out conferencing countries.
What is the channel availability?	It is available on EA/EAS, EES, CSP, and Web Direct.
What is the segment availability?	It is available for Commercial (including WW Commercial Public Sectors), Education, Nonprofit, and US GCC
What if a user with Extended Dial-out Minutes to USA/CAN is located in the US and travels to another country outside of an Audio-Conferencing sell-to market? Will their dial-out service work?	Yes. If a user based in the US (meaning their Office 365 license is assigned in the US) traveled to Zimbabwe (a market currently not in a sell-to location for Audio Conferencing), all dial-out minutes made to the US or Canada would continue to apply to their Extended Dial-out Minutes to USA/CAN add-on regardless of where the call takes place.

[1] Microsoft reserves the right to limit or terminate use of the capability in the event of abnormal usage or suspicion of use for fraudulent purposes.

Audio Conferencing complimentary dial-out period

12/5/2020 • 3 minutes to read • Edit Online

Skype for Business PSTN Services

Customers may use Microsoft 365 or Office 365 Calling Plan and Office 365 Audio Conferencing as permitted in the Skype for Business Online PSTN Services Use Terms and Customer's volume licensing agreement. The PSTN Services Use Terms may be found at Licensing Terms and Documentation.

End of complimentary dial out period

Beginning December 1, 2019, the complimentary dial-out capability will end. See Audio Conferencing subscription dial out and call me at benefit for additional details.

This change will not take place for countries where the Audio Conferencing subscription is available, but we do not currently provide the ability to set up Communications Credits. These specific countries are Russia, South Korea, and Taiwan.

Complimentary dial out period details

For customers adopting our Microsoft 365 or Office 365 Audio Conferencing service, Microsoft is providing an additional complimentary benefit related to dial out from meetings organized by users assigned an Microsoft 365 or Office 365 Audio Conferencing subscription license through November 2019. During this complimentary period, Microsoft allows meeting organizers or authorized attendees as defined in meeting policy settings, to make dial-out calls from within the meeting to non-premium phone numbers in the 44 Zone A countries and regions. This benefit is applicable to Audio Conferencing monthly subscription licenses and does not extend to Audio Conferencing pay-per-minute licenses.

Further, there is a 900 minute cap limit during the complimentary dial out period as such:

Users with a license usage location (this is the user country location defined in the licensing area of the Microsoft 365 admin center) in ANY country can dial out from a conference to any of the 44 Zone A countries and regions. Each user receives 900 minutes per user per month to ANY of the Zone A countries and regions which is pooled at the tenant level. For example, a customer has purchased 115 Audio Conferencing subscription licenses and has 10 users in US, 100 users in the UK and 5 users in India, all with Audio Conferencing subscription licenses assigned to their users.

> **NOTE**
> Pool size is based on assigned licenses and not purchased licenses.

- All 115 users share a pool of (115 users X 900 min) = 103,500 conferencing dial-out out minutes per calendar month which can be used to place outbound calls to any of the Zone A countries and regions.
- All calls exceeding the 103,500 minutes per calendar month are billed per minute using Communications Credits at our published rates to that destination. (Note: Tenant must set up Communications Credits and assign the Communications Credits license to the meeting organizer).
- All outbound calls to destinations not in the Zone A countries and regions list are billed per minute using Communications Credits at our published rates to that destination (provided tenant has set up Communications Credits and assigned the Communications Credits license to the meeting organizer).

> **NOTE**
>
> You can monitor the usage against dial-out minute pool in the Skype for Business Admin Center. In the Microsoft Teams & Skype Admin Center, go to **Legacy portal** > **Reports** > **PSTN Minute Pools**. This complimentary minute pool will be labeled in the report as "Outbound Calls to Zone A countries and regions."

Email notifications will be sent to all tenant administrators of a given customer when the utilization of the tenant's dial-out minutes pool has reached 80% and 100%.

For dial-out calls that are billed per minute (calls exceeding the tenant dial-out minute pool or calls to destinations not in the Zone A countries and regions list), the calls and their associated rates are based primarily on the destination of the call and not the country or region of the organizer or the participant initiating the dial-out call. For example, a call to a phone number in France will be billed with the same rate if it its initiated by a meeting participant in the United States or one in France.

For additional information on Communication Credits, see Communications Credits.

Related topics

- Country and region availability for Audio Conferencing and Calling Plans
- Country and region zones for Audio Conferencing

Audio Conferencing subscription "Dial-Out"/"Call Me At" minutes benefit

12/5/2020 • 4 minutes to read • Edit Online

Microsoft Teams and Skype for Business PSTN Audio Conferencing

Customers have been provided a complimentary dial-out capability that will end on November 30, 2019. Beginning December 1, 2019, each Audio Conferencing subscription provides 60 minutes per user per month that can be used to dial out to non-premium numbers in ANY of the Zone A countries and regions. Your tenant dial-out minute pool size is based on *assigned* licenses and not purchased licenses. This benefit is applicable to Audio Conferencing *monthly subscription* licenses and does not extend to Audio Conferencing pay-per-minute licenses.

> **NOTE**
> The end of the complimentary dial-out period will not take place on November 30, 2019, for countries where the Audio Conferencing subscription is available, but we do not currently provide the ability to set up Communications Credits. These specific countries are Russia, South Korea, and Taiwan.

Audio Conferencing "Dial Out From a Meeting" & "Call Me At" details

For customers adopting our Audio Conferencing service, Microsoft provides the ability to dial out from meetings organized by users assigned an Audio Conferencing subscription license. Dial-out calls to countries not included in the Zone A countries and regions list are charged per minute using Communications Credits. For dial-out calls that are billed per minute (calls exceeding the tenant dial-out minute pool or calls to destinations not in the Zone A countries and regions list, the calls and their associated rates are based on the destination of the call and not the organizer's country of residence or the meeting participant initiating the dial-out call. For example, an audio conference dial-out call to a phone number in France, which is a Zone A country, will be billed at the same per-minute rate if it were initiated by a meeting participant in the United States, France, or Zimbabwe.

MEETING ORGANIZER LICENSE USAGE LOCATION	DESTINATION DIALED	CAN I USE MY DIAL-OUT MINUTE POOL MINUTES?	DO I NEED COMMUNICATIONS CREDITS?
United States	United States	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
United States	United Kingdom	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
United States	Zimbabwe	No	Yes on *ALL* calls
United Kingdom	United Kingdom	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
United Kingdom	United States	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
United Kingdom	Zimbabwe	No	Yes on *ALL* calls

MEETING ORGANIZER LICENSE USAGE LOCATION	DESTINATION DIALED	CAN I USE MY DIAL-OUT MINUTE POOL MINUTES?	DO I NEED COMMUNICATIONS CREDITS?
Zimbabwe	Zimbabwe	No	Yes on *ALL* calls
Zimbabwe	United States	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
Zimbabwe	United Kingdom	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
Cook Islands	Cook Islands	No	Yes on *ALL* calls
Cook Islands	United States	Yes (Zone A country)	Yes *after* consuming the tenant minute pool
Cook Islands	United Kingdom	Yes (Zone A country)	Yes *after* consuming the tenant minute pool

How are minute pools calculated?

Consider the following example. A customer has purchased 115 Audio Conferencing subscription licenses and has 10 users in the United States, 100 users in the United Kingdom, and 5 users in Zimbabwe, all with Audio Conferencing subscription licenses assigned. All 115 users share a pool of (115 users x 60 min = 6,900 conferencing dial-out out minutes per calendar month) to place outbound calls to non-premium numbers in any of the Zone A countries and regions, *regardless* of where the meeting organizer is licensed or physically located. For example, a Zimbabwe meeting organizer will be able to dial out to any of the Zone A countries and regions up to the minute pool limit.

- All dial-out calls exceeding 6,900 minutes per calendar month are billed per minute using Communications Credits at our published rates to that destination. (Note: The customer must set up Communications Credits and assign the Communications Credits license to the meeting organizer.)
- All dial-out calls to destinations not in the Zone A countries and regions list are billed per minute using Communications Credits at our published rates to that destination (provided the customer has set up Communications Credits and assigned the Communications Credits license to the meeting organizer).

How can I monitor minute my pool usage?

- You can monitor the usage against your dial-out minute pool in the Microsoft Teams admin center. In the left navigation, go to **Analytics & reports** > **Usage reports**, and then select **PSTN minute pools**. The Zone A dial-out minute pool will be labeled in the report as "Outbound Calls to Zone A Countries."
- Email notifications will be sent to the following admins when the utilization of your organization's dial-out minutes pool has reached 80 percent and 100 percent:
    - Billing Administrator
    - Skype for Business Administrator
    - Company Administrator
    - User Account Administrator
    - Helpdesk Administrator
    - Service Support Administrator
    - Device Administrators

- Application Administrator
- License Administrator
- Cloud Device Administrator
- Authentication Administrator
- Privileged Authentication Administrator
- Teams Communications Administrator
- Teams Communications Support Engineer
- Teams Communications Support Specialist
- Teams Service Administrator

For additional information on Communication Credits, see Communications Credits.

Related topics

- Country and region availability for Audio Conferencing and Calling Plans
- Country and region zones for Audio Conferencing

Set up Audio Conferencing for Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

Sometimes people in your organization will need to use a phone to call in to a meeting. Microsoft Teams includes the audio conferencing feature for just this situation! People can call in to Teams meetings using a phone, instead of using the Teams app on a mobile device or PC.

You only need to set up Audio Conferencing for people who plan to schedule or lead meetings. Meeting attendees who dial in don't need any licenses assigned to them or other setup.

For frequently asked questions about Audio Conferencing, see Audio Conferencing common questions.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Step 1: Find out if Audio Conferencing is available in your country/region

Go to Country and region availability for Audio Conferencing and Calling Plans and select your country or region to get availability information about Audio Conferencing, as well as information about Phone System, Calling Plans, toll and toll-free numbers, and Communications Credits.

Step 2: Get and assign licenses

1. For Audio Conferencing, you need a license for each user who will set up dial-in meetings. To learn which licenses you need to buy for Audio Conferencing and how much they will cost, see Microsoft Teams add-on licensing.

   > **NOTE**
   > Audio Conferencing is included in Office 365 Enterprise E5 licenses and as an add-on.

2. After you buy the Audio Conferencing licenses, you will need to assign them to those people in your organization who are going to schedule or lead meetings. See Assign licenses to users in Microsoft 365 or Office 365 for business you purchased to the people in your organization who are going to schedule or lead meetings.

3. We also recommend that you assign Communications Credits licenses (they don't cost anything) to the same people you assigned licenses to in the previous step. To learn how to set up Communications Credits, see Set up Communications Credits for your organization.

> **NOTE**
> You can also set up pay-per-minute Audio Conferencing.

Step 3: Get service numbers for your conferencing bridges

For Audio Conferencing, you can't use phone numbers for users; you will need to get service numbers. You can

get either toll or toll-free service numbers for your conferencing bridges. There are three ways to get toll and toll-free service numbers:

- **Use the Microsoft Teams admin center**. For some countries/regions, you can get service numbers for your conferencing bridges using the Microsoft Teams admin center. See Getting service phone numbers.
- **Port your existing service numbers**. To port or transfer existing numbers from your current service provider or phone carrier to Microsoft 365 or Office 365. You can see Transfer phone numbers to Teams or Manage phone numbers for your organization for more information to help you do this.
- **Use a request form for new numbers**. Sometimes (depending on your country/region) you won't be able to get your new service numbers using the Microsoft Teams admin center, or you will need specific phone numbers or area codes. If so, you will need to download a form and send it back to us. See Manage phone numbers for your organization for more information.

Step 4: Assign a service number to the conferencing bridge

Once you get your toll and/or toll-free phone numbers for your conferencing bridge, you need to assign the numbers so they can be used on meeting invitations.

Follow these steps to assign a new phone number to your audio conferencing bridge.

Using the Skype for Business admin center:

1. Go to the **Microsoft 365 admin center** > **Admin centers** > **Teams** > **Legacy portal**.
2. Select **Voice** > **Phone numbers**.
3. Select the phone number, and click **Assign**.

For more details, see Change the phone numbers on your Audio Conferencing bridge.

Step 5: Set the default and alternate languages for a conferencing bridge

Next, you want to Set auto attendant languages for Audio Conferencing in Microsoft Teams that the conferencing auto attendant uses to greet callers when they dial in to a phone number for Audio Conferencing.

Using the Microsoft Teams admin center:

1. From the Dashboard, go to **Meetings** > **Conference bridges**.
2. Select the conferencing bridge phone number, click **Edit**, and then choose the default language.

Step 6: Set your conferencing bridge settings

After setting up your conferencing bridge, verify that the default settings such as entry/exit notifications and PIN length are the ones you want to use; if they're not, you can change them.

Using the Microsoft Teams admin center:

1. From the Dashboard, go to **Meetings** > **Conference bridges**.
2. Select **Bridge settings**. This will open the **Bridge settings** pane.

For more details, see Change the settings for an Audio Conferencing bridge.

Step 7: Assign dial-in phone numbers for users who lead meetings

After you have created an Audio Conferencing bridge, you need to set the toll and toll-free numbers for your

users.

You will need to do this for all of the people in your organization who lead or schedule meetings.

Using the Microsoft Teams admin center:

1. From the Dashboard, click **Users**, select the user from the list, and select **Edit**.
2. Select **Edit** next to **Audio Conferencing**, and then in the **Audio Conferencing** pane, choose a number in the **Toll number** and **Toll-free** number lists.

If you need more details, see Assign Microsoft as the audio conferencing provider.

Step 8: Set up meeting invitations (optional)

The dial-in numbers that are set for the user will be automatically added to the meeting invitations that are sent to meeting attendees. However, you can add your own help and legal links, a text message, and small company graphic if you want. See Customize meeting invitations.

Related topics

Audio Conferencing common questions

Phone numbers for Audio Conferencing in Microsoft Teams

Set options for online meetings and conference calls

Set up Audio Conferencing for small and medium businesses

12/5/2020 • 4 minutes to read • Edit Online

With Audio Conferencing, people can call in to Teams meetings using a phone instead of using the Teams app on their mobile device or from their computer.

If you're a small or medium-sized business with up to 300 users and you currently don't have any Audio Conferencing licenses, you can get Audio Conferencing free for one year. This free offer is available starting October 1, 2020.

The Audio Conferencing add-on license can be applied to users who have Microsoft 365 Business Basic, Business Standard, Business Premium, Enterprise E1, or Enterprise E3 licenses. To learn more, see Teams add-on licenses

> **NOTE**
> If you have Enterprise E5 or Microsoft 365 Business Voice, you won't be able to use the free Audio Conferencing offer because these licenses already include Audio Conferencing.

In this article, we'll walk you through how to set up Audio Conferencing. You only need to set up Audio Conferencing for people who plan to schedule or lead meetings. Meeting attendees who call in to meetings don't need licenses or other setup. To learn more, see Audio Conferencing.

Set up Audio Conferencing

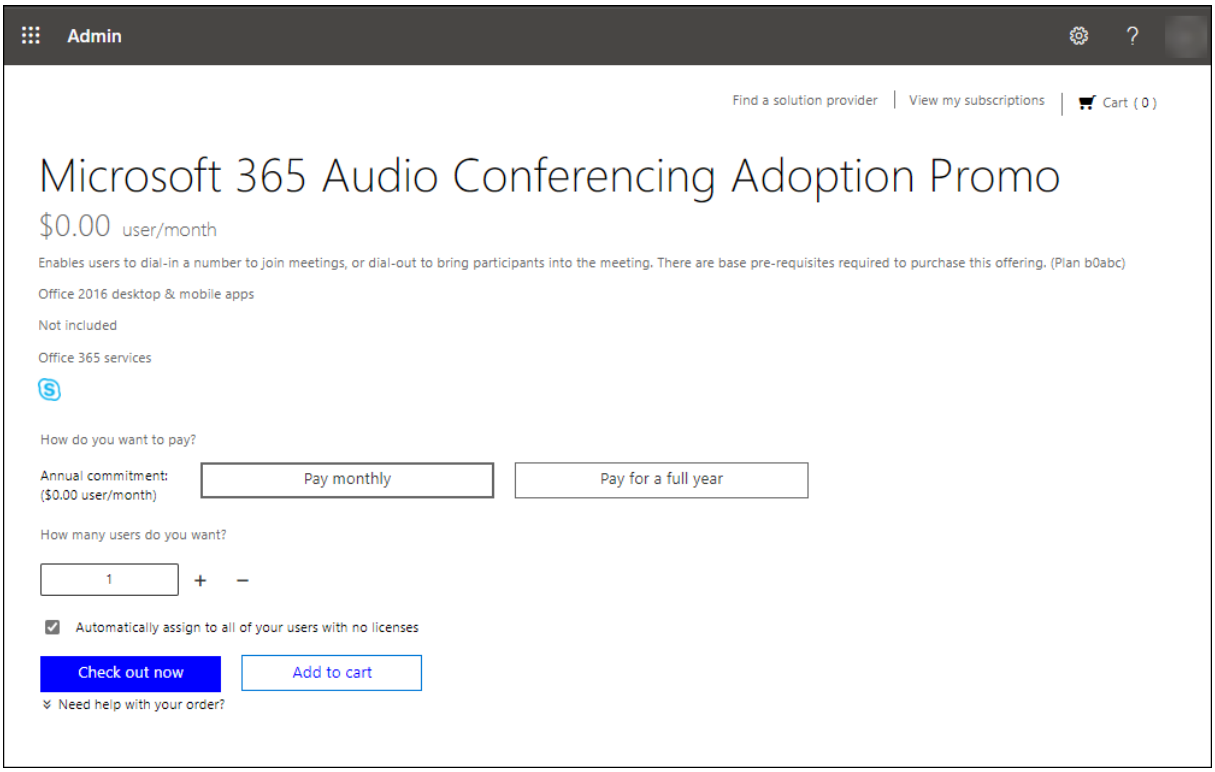
When you set up Audio Conferencing, a phone number is automatically assigned to your conferencing bridge so that it can be used in meeting invitations. The phone number that's assigned as the default number of your conferencing bridge will be one from the country or region of your organization. This phone number is a toll number, in which long-distance charges may apply.

> **NOTE**
> You can also use a toll-free number, which requires a few additional steps. To learn more about phone numbers for your conferencing bridge, see Audio Conferencing phone numbers later in this article.

Step 1: Get Audio Conferencing licenses

Get one Audio Conferencing license for each person who will lead meetings. Use the Microsoft 365 admin center to do this.

1. In the Microsoft 365 admin center, go to **Billing** > **Purchase services**, and then at the bottom of the page, select **Add-ons**.
2. Select **Microsoft 365 Audio Conferencing Adoption Promo** > **Details**, and then select **Get now**.
3. Enter the number of licenses you need for your meeting organizers, and then complete your order.



> **NOTE**
>
> Clear or select the **Automatically assign to all of your users with no licenses**, depending on whether you want to automatically assign an Audio Conferencing license to all users who don't have this license.

Step 2: Assign an Audio Conferencing license to users who lead meetings

Assign a license to each person who will lead meetings. Use the Microsoft 365 admin center to do this.

Assign a license to one user

1. In the Microsoft 365 admin center, go to **Users** > **Active users**.
2. Select the row of the user you want to assign the license to, and then in the pane, select **Licenses and Apps**.
3. Select the **Microsoft 365 Audio Conferencing** check box, and then select **Save changes**.

Assign a license to multiple users

1. In the Microsoft 365 admin center, go to **Users** > **Active users**.
2. Select the circles next to the users you want to assign the license to, and then select **Manage product licenses**.
3. In the **Manage product licenses** pane, select **Assign more**.
4. Select the **Microsoft 365 Audio Conferencing** check box, and then select **Save changes**.

Schedule Teams meetings in Outlook

Your meeting organizers can now schedule meetings in Outlook. In Outlook, go to **Calendar**, and then select the **New Teams meeting** button. The meeting dial-in numbers and the conference ID are automatically added to the meeting invitation that's sent to meeting attendees. To learn more, see Schedule a Teams meeting in Outlook.

> **NOTE**
>
> If you want, you can customize meeting invitations to add your company logo, links to your support website and legal disclaimer, and a text-only footer. To learn more, see Customize meeting invitations.

Audio Conferencing phone numbers

There are two types of numbers that you can use for your conferencing bridge. You can use either **shared numbers** (as in the Set up Audio Conferencing section earlier in this article) or **dedicated numbers**. Here's more information about each.

Shared numbers

A shared number is a number that's shared across all organizations. Shared numbers are toll numbers and are automatically assigned when you set up Audio Conferencing.

To see the default number that's assigned to your conferencing bridge, in the left navigation of the Microsoft Teams admin center, go to **Meetings** > **Conference bridges**, and then find the number for the location that's nearest to you.

Dedicated numbers

A dedicated number is a number that's available only to your users. A dedicated number can be a toll number or a toll-free number. To use a dedicated number, you'll have to first get the number, assign it to your conferencing bridge, and then assign the number to each person who will lead meetings.

There are a couple ways to get a dedicated number. You can get a number from Microsoft or transfer (port) an existing number from your current service provider to Microsoft. To learn more about how to do this, see Getting service numbers.

Keep in mind that if you use a toll-free number, you have to first assign a Communications Credits license to each person who will lead meetings. To learn more, see Set up Communications Credits for your organization.

After you have your number, assign it to your conference bridge. Use the Microsoft Teams admin center to do this.

1. In the left navigation of the Microsoft Teams admin center, go to **Meetings** > **Conference bridges**.
2. Select **Add**, and then select **Toll number** or **Toll-free number**.
3. In the **Add phone number** pane, select the number, and then select **Apply**.

Then, assign the number to each person who will lead meetings. Use the Microsoft Teams admin center to do this.

1. In the left navigation of the Microsoft Teams admin center, select **Users**, click the display name of the user, and select **Edit**.
2. Select **Edit** next to **Audio Conferencing**, and then in the **Audio Conferencing** pane, select a number in the **Toll number** or **Toll-free** number lists, and then select **Apply**.

Related topics

- Audio Conferencing
- Set up Audio Conferencing for Teams
- Phone numbers for Audio Conferencing
- Audio Conferencing common questions
- Getting service numbers
- Teams add-on licenses
- Assign licenses to users

Change the phone numbers on your Audio Conferencing bridge

9/15/2020 • 9 minutes to read • Edit Online

When you buy **Audio Conferencing** licenses, Microsoft is hosting your audio conferencing bridge for your organization. The audio conferencing bridge gives out dial-in phone numbers from different locations so that meeting organizers and participants can use them to join Skype for Business or Microsoft Teams meetings using a phone.

In addition to the phone numbers already assigned to your conferencing bridge, you can get additional service numbers (toll and toll-free numbers used for audio conferencing) from other locations, and then assign them to the conferencing bridge so you can expand coverage for your users.

> **NOTE**
> To be able to assign/unassign a phone number for a conferencing bridge, the phone number must be a '*service*' number. You can see the type of number it is by navigating to **Voice** > **Phone numbers** in the legacy portal and looking in the **Number Type** column. Microsoft 365 or Office 365 Communications Credits must be set up first in order for users to dial into the bridge on a toll free number.

Steps when you are assigning a new service phone number to your conference bridge

Step 1 - Assign the new phone number to your audio conferencing bridge

1. Sign in to Microsoft 365 or Office 365 with your work account.
2. Go to **Microsoft 365 admin center** > **Admin centers** > **Teams & Skype** > **Legacy portal** > **Voice** > **Phone numbers**.
3. Select the phone number from the list, and in the Action pane, click **Assign**.
4. On the **Assign** page, click **Save**.

Step 2 - Change the default phone number of your conference bridge (optional)

The default phone number of your conference bridge defines the caller ID that will be used when an outbound call is placed by a participant or the organizer from within a meeting.

Only a service toll number can be set as the default number for your conferencing bridge; **service toll-free numbers can't be set as the default number of your conferencing bridge**. If you are assigning a service toll number and you would like to set it as the new default number for your audio conferencing bridge, perform these steps:

1. Sign in to Microsoft 365 or Office 365 with your work account.
2. Go to **Microsoft 365 admin center** > **Admin centers** > **Teams & Skype** > **Meetings** > **Conference Bridges**.
3. Highlight the service toll number that you want to configure as the default.
4. Select **Set as default**.

Step 3 - Change the default phone numbers that are included in the meeting invites of users (optional)

The default phone numbers of a user are the ones that are included on their meeting invites when they schedule a meeting. For more information, including how the default phone numbers are assigned for new users, see Set the phone numbers included on invites in Microsoft Teams or Set the phone numbers included on invites in Skype for Business Online.

1. Sign in with your work or school account.
2. Go to the **Microsoft 365 admin center** > **Admin centers** > **Teams & Skype** > **Legacy portal** > **Audio conferencing** > **Users**, and select the users on the list.
3. Click **Edit** in the action pane.
4. Under **Default toll number** or **Default toll-free number**, select the number in the list and click **Save**.

After the changes have been saved, the new default phone numbers will be included on the meeting invites of organizers the next time they schedule a new meeting.

Step 4 - Update existing meeting invites of users using the Meeting Migration Service (optional)

For the next two steps, you will need to start Windows PowerShell.

If you updated the default phone numbers that are included in the meeting invites for some or all of your users, you can optionally update meeting invites that were already sent to users in your organization before their default phone numbers were changed using the Meeting Migration Service. For additional information, see Setting up the Meeting Migration Service (MMS).

- Run the Meeting Migration Service (MMS) for the users who had their default phone numbers changed in Step 2. To do this, run the following command:

```
Start-CsExMeetingMigration user@contoso.com
```

- You can also view the meeting migration status. All meetings would be rescheduled once there are no operations in *Pending* or *In-Progress* state.

```
Get-CsMeetingMigrationStatus -SummaryOnly
```

Steps when you are unassigning a service phone number for a conferencing bridge

When you unassign a phone number from a conferencing bridge, users won't be able to join any meetings using that phone number anymore. Because the phone number is changing, it's important to update all users who could have a phone number as their default number (if any) and to update their existing meeting invites before the phone number is unassigned from the audio conferencing bridge.

If the phone number is removed without updating the users and their meetings, their existing meeting invites could contain a phone number that won't work for joining their meetings.

For the first three steps, you will need to start Windows PowerShell. To see how to do this, click Want to know how to manage with Windows PowerShell?

Step 1 - Update users who have the phone number to be unassigned as one of their default numbers

Replace the default toll or toll-free number for all users who have the number to be unassigned as a default number and start the process of rescheduling their meetings. To do this, run the following command:

```
Set-CsOnlineDialInConferencingUserDefaultNumber -FromNumber <Number to be removed> -ToNumber <Number to be set as new default> -NumberType <"Toll" or "Toll-Free"> -RescheduleMeetings
```

IMPORTANT

You can also change the default toll or toll-free number of users in the Skype for Business admin center. However, this won't automatically reschedule their meetings.

For additional information, see Set the phone numbers included on invites in Microsoft Teams or Set the phone numbers included on invites in Skype for Business Online.

NOTE

Depending on the size of your organization, this could take some time to complete.

Step 2 - View meeting migration status using Windows PowerShell

All meetings will be rescheduled once there are no operations in *Pending* or *In-Progress* state.

```
Get-CsMeetingMigrationStatus -SummaryOnly
```

For more information about the Meeting Migration Service, see Setting up the Meeting Migration Service (MMS).

Step 3 - Unassign the old phone number from the audio conferencing bridge

1. Sign in with your work or school account.
2. Go to the **Microsoft 365 admin center** > **Admin centers** > **Teams & Skype** > **Legacy portal** > **Voice** > **Phone numbers**.
3. If the phone number is a toll-free number, select the phone number from the list, and in the Action pane, click **Unassign**. If the phone number is a toll-number, please contact Microsoft support to have the phone number unassigned.
4. If the phone number is a toll-free number, click **Yes** in the confirmation window.

IMPORTANT

After a phone number is unassigned from an audio conferencing bridge, the phone number will no longer be available for users to join new or existing meetings.

Want to know how to manage with Windows PowerShell?

To verify that Windows PowerShell is ready to go

These steps check that you are running Windows PowerShell version 3.0 or higher.

1. Type **Start Menu** > **Windows PowerShell**.
2. Type *Get-Host* in the **Windows PowerShell** window to check the version.
3. If you don't have version 3.0 or higher, you need to download and install updates to Windows PowerShell. See Windows Management Framework 4.0 to download and update Windows PowerShell to version 4.0. Restart your computer when you are prompted.
4. You also need to install the Windows PowerShell module for Skype for Business Online that enables you to

create a remote Windows PowerShell session that connects to Skype for Business Online. This module is supported only on 64-bit computers and can be downloaded from the Microsoft Download Center at Windows PowerShell Module for Skype for Business Online. Restart your computer if you are prompted.

If you need to know more, see Connect to all Microsoft 365 or Office 365 services in a single Windows PowerShell window.

To start Windows PowerShell

Start a Windows PowerShell session

1. From the **Start Menu** > **Windows PowerShell**.
2. In the **Windows PowerShell** window, connect to Microsoft 365 or Office 365 by running:

> **NOTE**
>
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module.
>
> If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
Import-Module -Name MicrosoftTeams
$credential = Get-Credential
$session = New-CsOnlineSession -Credential $credential
Import-PSSession $session
```

> **NOTE**
>
> You only have to run the **Import-Module** command the first time you use the Skype for Business Online Windows PowerShell module. If you want more information about starting Windows PowerShell, see Connect to all Microsoft 365 or Office 365 services in a single Windows PowerShell window or Connecting to Skype for Business Online by using Windows PowerShell.

Save time and automate

To save time by automating this process, you can use the Set-CsOnlineDialInConferencingUser or the **Set-CsOnlineDialInConferencingUserDefaultNumber** cmdlets.

- Use the Set-CsOnlineDialInConferencingUser cmdlet to change the default toll or toll-free number for specific users.
  - To change the default toll-free number for a user, run:

```
Set-CsOnlineDialinConferencingUser -Identity amos.marble@Contoso.com -TollFreeServiceNumber
80045551234
```

- Use the **Set-CsOnlineDialInConferencingUserDefaultNumber** cmdlet to change the default toll or toll-free number of users based on their original default number or their location.

  > **NOTE**
  >
  > To find the BridgeID, use the **Get-CsOnlineDialInConferencingBridge**.

  - To set the default toll-free number for all users without one to 8005551234, run:

```
Set-CsOnlineDialInConferencingUserDefaultNumber -FromNumber $null -ToNumber 8005551234 -NumberType
TollFree -BridgeId <Bridge Id>
```

- To change the default toll-free number of all users that have 8005551234 as their default toll-free number to 8005551239 and automatically reschedule their meetings, run:

```
Set-CsOnlineDialInConferencingUserDefaultNumber -FromNumber 8005551234 -ToNumber 8005551239 NumberType
TollFree -BridgeId <Bridge Id> -RescheduleMeetings
```

- To set the default toll-free number of all users located in the U.S. to 8005551234 and automatically reschedule their meetings, run:

```
Set-CsOnlineDialInConferencingUserDefaultNumber -Country US -ToNumber 8005551234 -NumberType TollFree -
BridgeId <Bridge Id> -RescheduleMeetings
```

> **NOTE**
> The location that is used above needs to match the contact information of user(s) that is set in the Microsoft 365 admin center.

Troubleshooting

Unassign button isn't available

You want to Unassign a number but the button isn't available, and if while hovering over it, you are redirected to contact Support with the following message *"Default or shared numbers can´t be unassigned from the bridge. To unassign dedicated toll numbers, please contact support.*".

To obtain more information about the bridge(s), run the following Powershell :

```
Get-CsOnlineDialInConferencingBridge -Name "Conference Bridge"
```

The result, aside other information like Identity, Name and Region, should also contain the DefaultServiceNumber.

Example, to unassign, the DefaultServiceNumber "8005551234"

```
Unregister-CsOnlineDialInConferencingServiceNumber -BridgeName "Conference Bridge" -RemoveDefaultServiceNumber
8005551234
```

About Windows PowerShell

With Windows PowerShell you can manage users and what they are or are not allowed to do. Windows PowerShell can help you manage Microsoft 365 or Office 365 and Skype for Business Online using a single point of administration that can simplify your daily work, especially when you've got multiple tasks to do. To get started with Windows PowerShell, see these topics:

- An introduction to Windows PowerShell and Skype for Business Online
- Why you need to use Office 365 PowerShell

Windows PowerShell has many advantages in speed, simplicity, and productivity over only using the Microsoft 365 admin center such as when you are making setting changes for many users at one time. Learn about these

advantages in the following topics:

- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell
- Using Windows PowerShell to manage Skype for Business Online
- Using Windows PowerShell to do common Skype for Business Online management tasks

Related topics

Change the settings for an Audio Conferencing bridge

Change the settings for an Audio Conferencing bridge

6/10/2020 • 5 minutes to read • Edit Online

When you are setting up Audio Conferencing in Microsoft 365 or Office 365, you will receive phone numbers for your users from what is called an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers. These phone numbers are used when callers dial in to a meeting. The phone number is included at the bottom of the Skype for Business or Microsoft Teams meeting invite.

The conferencing bridge answers a call and prompts the caller with voice prompts using a meeting auto attendant, and then, depending on your settings, it can play notifications, ask callers to record their name, and control the PIN settings. PINs are given to meeting organizers to allow them to start a meeting when they are aren't using a Skype for Business or Microsoft Teams app.

IMPORTANT

A PIN is only required for the meeting organizer when a Skype for Business or Microsoft Teams app user hasn't already started the meeting. If everyone is dialing in to the meeting, the PIN is required for the meeting organizer to start the meeting.

NOTE

We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference bridges**.
2. At the top of the **Conference bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, select:

   - **Meeting entry and exit notifications** If you turn this off, users who have already joined the meeting won't be notified when someone enters or leaves the meeting.

     When you turn on **Meeting entry and exit notifications**, you can select these options:

   - **Names or phone numbers** When users dial in to a meeting, their phone number will be played when they join it.
   - **Tones** When users dial in to a meeting, an audio tone will be played when they join it.
   - **Ask callers to record their name before joining the meeting** If you turn this off, callers won't be asked to record their name before they join a meeting.

4. To set the PIN length for meetings, select the number of digits you want for the PIN in the **PIN length** list.
5. To specify whether to send email to your users, enable or disable **Automatically send emails to users if their audio conferencing configuration changes**. See Emails automatically sent to users when their Audio Conferencing settings change in Microsoft Teams or Emails sent to users when their settings change in Skype for Business Online for more information.

6. Click **Save**.

Using the Skype for Business admin center

Set up the meeting experience when callers join a meeting

1. In the **Skype for Business admin center**, in the left navigation go to **Audio conferencing** > **Microsoft bridge settings**.
2. On the **Microsoft bridge settings** page, under **Meeting join experience**, select:
   - **Enable meeting entry and exit notifications to be turned on** This is selected by default. If you clear the check box, users who have already joined the meeting won't be notified when someone enters or leaves the meeting.
   - When you select **Enable meeting entry and exit notifications to be turned on**, you can select these options from the **Entry/exit announcement type** list:
   - **Names or phone numbers** When users dial in to a meeting, their phone number will be played when they join it.
   - **Tones** When users dial in to a meeting, an audio tone will be played when they join it.
   - **Ask callers to record their name before joining the meeting** This is selected by default. If you clear the check box, callers won't be asked to record their name before they join a meeting.
3. After you make your changes, click **Save**.

Set the PIN length for meetings

1. Sign in with your work or school account.
2. Go to the **Microsoft 365 admin center** > **Skype for Business**.
3. In the **Skype for Business admin center**, in the left navigation, go to **Audio conferencing** > **Microsoft bridge settings**.
4. On the **Microsoft bridge settings** page, under **Security**, enter the number of digits you want for the PIN in the **PIN length** list, and then click **Save**.

> **IMPORTANT**
> The PIN must be between 4 and 12 digits.

Select whether to send email to your users

1. Sign in with your work or school account.
2. Go to the **Microsoft 365 admin center** > **Skype for Business**.
3. In the **Skype for Business admin center**, in the left navigation, go to **Audio conferencing** > **Microsoft bridge settings**.
4. On the **Microsoft bridge settings** page, select or clear **Automatically send emails to users if their dial-in information changes**, and then click **Save**.

   See Emails automatically sent to users when their Audio Conferencing settings change in Microsoft Teams or Emails sent to users when their settings change in Skype for Business Online for more information.

Want to know how to manage with Windows PowerShell?

- To save time or automate this process, you can use the Set-CsDialinConferencingBridge cmdlet.
- Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:
  - Why you need to use Office 365 PowerShell
  - Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell
- Windows PowerShell has many advantages in speed, simplicity, and productivity over only using the Microsoft 365 admin center, such as when you are making setting changes for many users at one time. Learn about these advantages in the following topics:
  - An introduction to Windows PowerShell and Skype for Business Online
  - Using Windows PowerShell to manage Skype for Business Online
  - Using Windows PowerShell to do common Skype for Business Online management tasks

    NOTE

    The Windows PowerShell module for Skype for Business Online enables you to create a remote Windows PowerShell session that connects to Skype for Business Online. This module, which is supported only on 64-bit computers, can be downloaded from the Microsoft Download Center at Windows PowerShell Module for Skype for Business Online.

Related topics

Set up Audio Conferencing for Microsoft Teams

Set up Audio Conferencing for Skype for Business Online

See a list of Audio Conferencing numbers in Microsoft Teams

7/7/2020 • 2 minutes to read • Edit Online

When you set up Audio Conferencing for Microsoft Teams users, you can view the phone numbers that are available to them for audio conferencing. This list will have all of the audio conferencing phone numbers that are available to your organization.

Looking for prices? See Pricing for Audio Conferencing.

If there is only one phone number available in your organization, it will be used as the default number for all of your users. When multiple phone numbers are available, you can select the default phone number for each user. This default number will be included in Microsoft Teams meeting invitations.

You can see Set the phone numbers included on invites to change the dial-in phone number for a single user.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

To view your audio conferencing phone numbers

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference bridges**.
2. View the phone numbers that are available for audio conferencing.

- You can also view the location and primary language that will be used by the audio conferencing auto attendant.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Set auto attendant languages for Audio Conferencing in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

The Audio Conferencing auto attendant for Microsoft Teams can greet audio callers in a number of different languages when they join a meeting.

Choose one primary language and up to four secondary languages. The primary language that you set will be used first and the secondary languages will be used by the auto-attendant in order that you select.

> **NOTE**
> You can only change the languages of audio conferencing numbers that are of the Dedicated category. The languages of Shared audio conferencing number can't be changed.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Set the conferencing auto attendant languages

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. Select a **Dedicated** audio conferencing phone number from the list, and at the top of the page, click **Edit**. It is only possible to change the languages of Dedicated audio conferencing numbers. The **Edit** option is only shown when a Dedicated audio conferencing number is selected.
3. In the pane on the right, choose the default language you want and any alternate languages.

   > **NOTE**
   > The default and alternate languages that are supported are listed. The order in which you select them in the lists will be the order of the languages presented to callers.

4. Click **Save**.

Want else should I know?

- To see the list of supported languages for Audio Conferencing, see Audio Conferencing supported languages.
- Languages can be set for dedicated but not for shared phone numbers.
- To see a list of countries/regions in which Audio Conferencing in Microsoft 365 or Office 365 using Microsoft as the provider is available, see Phone numbers for Audio Conferencing.

Want to use Windows PowerShell?

See the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Set up meeting dial-out confirmation for your users in Microsoft Teams

2/28/2020 • 2 minutes to read • Edit Online

Meeting dial outs and Call me calls are very useful ways to invite participants to join a meeting and for existing participants to join a meeting using a traditional or mobile phone. However, when the called person is unable to answer the call and the call is answered by a voicemail system, the voicemail system is connected to the meeting and participants will be able to listen to it until it's removed from the meeting.

To prevent voicemail systems from connecting to meetings when a meeting dial out is sent to a phone number and the called person is unable to answer the call, you can set up Teams to request a confirmation from the called person for them to join the meeting. If the called person can't answer the call and the call is answered by a voicemail system, the voicemail system won't be connected to the meeting because it won't provide a confirmation to join it.

When this capability is enabled, people that receive a dial out or Call me call must confirm that they want to join the meeting by pressing 1 on their traditional or mobile phone.

To enable this capability for all meetings in your organization, set the `EnableDialOutJoinConfirmation` parameter of the Set-CsOnlineDialInConferencingTenantSettings cmdlet to `true`. To do this, run the following command:

```
Set-CsOnlineDialInConferencingTenantSettings -EnableDialOutJoinConfirmation $true
```

Related topics

- Set up the Call me feature for your users
- Teams PowerShell overview

Manage the Audio Conferencing settings for your organization in Microsoft Teams

12/5/2020 • 6 minutes to read • Edit Online

It might be easier for you to see all of the audio conferencing settings for Microsoft Teams in one place.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Assign an Audio Conferencing license

> **NOTE**
> You can't assign licenses using Teams. You must use the Microsoft 365 admin center. See Assign Microsoft Teams add-on licenses.

To assign a license for a user

1. Sign in to Microsoft 365 with your work or school account.
2. In the left navigation of the **Microsoft 365 admin center**, go to **Users** > **Active users**, and then select the user or users from the list of available users.

   > **NOTE**
   > If you are assigning licenses to up to 20 users at the same time, you can use the **Select a view** drop-down then choose one of the options or create your own view. Then click **Edit**, **Next** twice then select the license and click **Submit**.

3. In the Action pane under **Product licenses**, click **Edit**.
4. On the **Product Licenses** page, turn on **Audio Conferencing** and then click **Save**. For more on licensing, see Microsoft Teams add-on licensing.

   > **NOTE**
   > After you assign the license, Microsoft might not appear initially in the list as an audio conferencing provider. If this happens, either log out of the admin center or press CTRL+F5 to refresh the browser window.

Enable or disable emails sent to audio conferencing users

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, enable or disable **Automatically send emails to users if their dial-in**

settings change.

4. Click **Save**.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

Reset the meeting conference ID

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Under **Audio Conferencing**, click **Reset conference ID**.
3. In the **Reset conference ID?** window, click **Reset**. A conference ID will be automatically created and an email sent to the user with the new conference ID if sending email to your users is enabled. It's enabled by default.

See Reset a conference ID for a user.

Reset a conference organizer's PIN

Each meeting that a user schedules will get assigned a unique conference ID. Although a conference ID will be automatically created and assigned to a user, there may be times when a user doesn't want to use this one and you want to set it to a certain number, or your users can't remember or have lost their conference ID.

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Under **Audio Conferencing**, click **Reset PIN**, and then click **Reset**.

Users will receive an email with their PIN when they're enabled for audio conferencing or when the PIN is reset. But if you have disabled automatically sending emails, a PIN reset email won't be sent and you will have to manually send the PIN to the user. The PIN will only be shown once after it has been reset. After it's displayed just after being reset, the PIN won't be shown anymore on the user properties; instead, ***** will be shown.

See Reset the Audio Conferencing PIN.

Send an email with Audio Conferencing information to a user

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Under **Audio Conferencing**, click **Send conference info in email**.

> **NOTE**
> When you do this, the audio conferencing PIN isn't sent to the user.

See Send an email to a user with their Audio Conferencing information.

Set the phone numbers included on invites

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Next to **Audio Conferencing**, click **Edit**.
3. In the **Audio Conferencing** pane, you can set the **Toll number** and, if allowed, the **Toll-free number**.
4. Click **Save**.

See Set the phone numbers included on invites.

Choose audio conferencing bridge settings

Set the meeting experience when callers join a meeting

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, enable or disable **Meeting entry and exit notifications**.

   This is enabled by default. If you disable this option, users who have already joined the meeting by default won't be notified when someone enters or leaves the meeting.
4. Under **Entry/exit announcement type**, choose either **Tones** or **Names or phone numbers**.

   If you choose **Names or phone numbers**, you can also choose to enable or disable **Ask callers to record their name before joining the meeting**.

   > **NOTE**
   > By default, external participants can't see the phone numbers of dialed-in participants. If you want to maintain the privacy of these phone numbers, select **Tones** for **Entry/exit announcement type** (this prevents the numbers from being read out by Teams).

5. Click **Save**.

See Change the settings for an Audio Conferencing bridge.

Set the PIN length for meetings

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, enter the number of digits you want for the PIN in the **PIN length** list, and then click **Save**.

   The PIN must be between 4 and 12 digits. The default is 5.

See Change the settings for an Audio Conferencing bridge.

Enable or disable email from being sent to audio users

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.

3. In the **Bridge settings** pane, enable or disable **Automatically send emails to users if their audio conferencing settings change**.
4. Click **Save**.

   You can also send email to the user with the audio conferencing settings, by going to the user's audio conferencing properties and clicking **Send conference info in email**.

   If you do this, an email will be sent that only includes conference ID and conference phone number, but the PIN won't be included.

See Send an email to a user with their Audio Conferencing information.

See and set the primary (default) and secondary (alternate) languages on an audio conferencing bridge

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. Select a phone number from the list and click **Edit**.
3. Choose the languages you want under **Default language** and **Alternate languages (optional)**.
4. Click **Save**.

See Set auto attendant languages for Audio Conferencing.

See audio conferencing dial-in numbers

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. Select a phone number from the list and click **Edit**. Here you can:
   - View the phone numbers that are to be used for Audio Conferencing.
   - View the location, and the primary language, that will be used by the Audio Conferencing auto attendant.

See See a list of Audio Conferencing numbers.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Microsoft 365 or Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Manage the Audio Conferencing settings for a user

Audio Conferencing pay-per-minute

8/17/2020 • 2 minutes to read • Edit Online

In addition to the standard Audio Conferencing per-user license, Volume and Licensing organizations can also choose a pay-per-minute offer to enable Audio Conferencing capabilities for their organizations.

You can find out if your country/region is supported for Audio Conferencing.

> **NOTE**
> Because this offer is only available to Volume and Licensing customers, you will need to work with your account representative to acquire these licenses.

Need some details?

Whereas the Audio Conferencing per-user license offer includes dial-in usage and some dial-out usage, Audio Conferencing pay-per-minute **allows you to pay for all of your Audio Conferencing usage on a per-minute basis without paying for a per-user monthly license**. With this, all dial-in and dial-out calls will be charged on a per-minute basis, including:

- Inbound calls to toll Audio Conferencing numbers of your organization.
- Inbound calls to toll-free Audio Conferencing numbers of your organization.
- Outbound calls placed to external phone numbers from within a meeting of your organization.

> **NOTE**
> You can find the dial-in and dial-out rates associated to these types of calls by reviewing the **See rates for where you want to call section** in Audio Conferencing.

Pay-per-minute requires your organization to have Communications Credits set up. It also requires that a Pay-per-minute license and a Communications Credits license must both be assigned to each user for Audio Conferencing to work. If you want more details, see Set up Communications Credits for your organization and/or Microsoft Teams add-on licensing.

To enable Audio Conferencing pay-per-minute for users in your organization, see Try or purchase Audio Conferencing in Microsoft Office 365 or Office 365.

Why is it best for you?

- Pay per-minute will only be charged on a per-minute basis for each inbound or outbound call placed by each attendee during a scheduled meeting (rates vary for toll or toll-free call and by destination) instead of using Skype for Business or Teams application in a mobile device or PC.
- Capability to manage cost since admins can control to restrict the types of dial-outs (international and domestic) that can be done from the meetings of an organizer. See Outbound calling restriction policies for Audio Conferencing and user PSTN calls
- If you have Audio Conferencing pay-per-minute licenses, you don't have to assign Communications Credits licenses separately to each user specifically for Audio Conferencing usage (you might still need

to assign them for other services).

- Control and monitor pay-per minute charges by using Communications Credits.
- More flexibility in pricing for customers who don't need all users on a subscription basis.
- Enable Audio Conferencing pay-per-minute along with a monthly subscription of E5 or a standalone Audio Conferencing subscription, both services will continue to work the same way. Changes will have no effect on the operations of Audio Conferencing or Communications Credits.

Want to find out more about pricing?

Looking for prices? See the following:

- Pricing for Audio Conferencing
- Pricing for Phone System
- Pricing for Calling Plans

Related topics

Microsoft Teams add-on licensing

Manage the Audio Conferencing settings for a user in Microsoft Teams

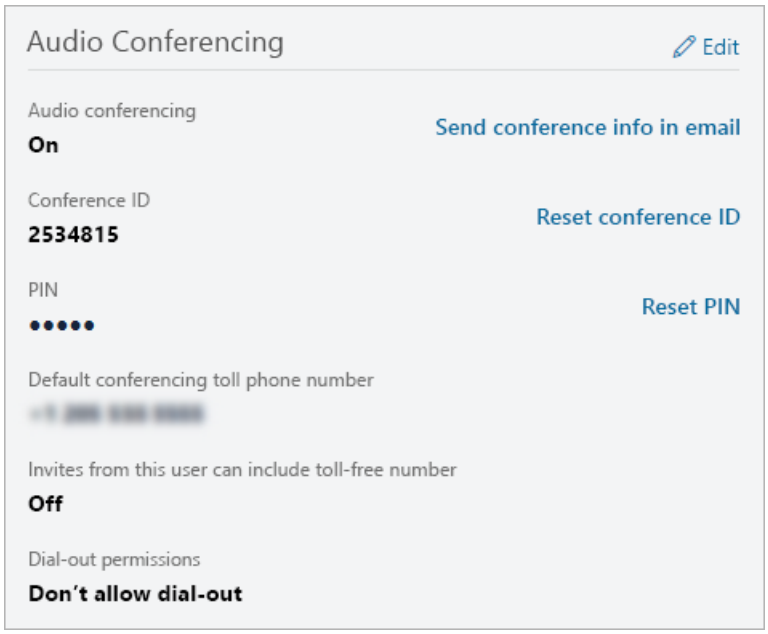
12/5/2020 • 2 minutes to read • Edit Online

As a Microsoft 365 or Office 365 admin, you can edit the Audio Conferencing settings—such as the provider, default toll or toll-free number, conference ID, or PIN—for an individual user in your organization. If you want to edit settings for your organization, see Manage the Audio Conferencing settings for your organization.

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Click **Edit**.
3. Under **Audio Conferencing**, modify any of the following:

SETTING	DESCRIPTION
Audio conferencing	To turn audio conferencing on or off for the user, click **Edit** next to **Audio Conferencing**, and then in the **Audio Conferencing** pane, toggle **Audio conferencing** On or Off.
Send conference info in email	Click this link only if you want to immediately send an email to the user with his or her conference ID and phone number. (This email does not include the PIN.) See Send an email to a user with their Audio Conferencing information.
Conference ID	Click **Reset conference ID** if you need to reset the conference ID for the user. For more information, see Reset a conference ID for a user.
PIN	Click **Reset PIN** if you need to reset the PIN for the user. For more information, see Reset the Audio Conferencing PIN.
Default conferencing toll phone number (required)	These will be numbers that are set on the audio conferencing bridge. Format the numbers as you want them to appear in Skype for Business and Microsoft Teams meeting requests. To change the default toll number, click **Edit** next to **Audio Conferencing** and in the **Audio Conferencing** pane, select a number under **Toll number**.
Invites from this user can include toll-free number	To change this setting, click **Edit** next to **Audio Conferencing** and in the **Audio Conferencing** pane, toggle **Include toll-free numbers in meeting requests from this user** On or Off.
Unauthenticated users can be the first person in the meeting	To change this setting, toggle **Unauthenticated users can be the first person in the meeting** On or Off.
Dial-out permissions	To change this setting, click **Edit** next to **Audio Conferencing** and in the **Audio Conferencing** pane, choose an option under **Dial-out from meetings**.



NOTE

We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Related topics

Manage the Audio Conferencing settings for your organization

Audio Conferencing common questions

See a list of users that are enabled for Audio Conferencing in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

After you have enabled Microsoft Teams users in your organization for Audio Conferencing, you can view the list of those users who have been enabled.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Viewing a list of users

- In the Microsoft Teams admin center, in the left navigation, click **Users**.

What else should I know?

- When you view the list of users that are enabled, you can select a user from the list to edit the audio conferencing settings for that user.
- When you select a single user, you can view the default phone number assigned to the user and any other relevant audio conferencing settings.
- You can use the search button to search for an individual user in the list.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Enable users to record their name when they join a meeting in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

When you are setting up Audio Conferencing in Microsoft 365 or Office 365, you will receive phone numbers and what is called an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers that can be a dedicated or shared phone number.

The conferencing bridge answers a call for a user who is dialing in to a meeting using a phone. The conferencing bridge answers the caller with voice prompts from an auto attendant, and then, depending on their settings, can play notifications, ask callers to record their name, and set up the PIN security for meeting organizers. PINs are given to meeting organizers to allow them to start a meeting. However, you can set it up so a PIN isn't required to start a meeting.

Set whether callers should record their name



Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. Enable or disable **Meeting entry and exit notifications**.
4. If enabling notifications, choose **Names or phone numbers** under **Entry/exit announcement type**, and then turn on **Ask callers to record their name before joining a meeting.**
5. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing

Reset a conference ID for a user in Microsoft Teams

8/13/2020 • 2 minutes to read • Edit Online

A dynamic conference ID is included at the bottom of meeting invitations along with the dial-in phone numbers that can be used by callers to call in to a meeting. When the user dials the phone number, the auto attendant for the meeting will ask the caller to enter this conference ID so they can attend the meeting.

> **NOTE**
> Conference IDs are generated automatically, will be between 7-9 digits, and are set when you enable Audio Conferencing for a user. **Static conference IDs aren't supported.**

Resetting the conference ID for a user

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Click **Edit**.
3. Under **Audio Conferencing** click **Reset conference ID**.
4. In the **Reset conference ID** window, click **Reset**. A conference ID will be automatically created and an email sent to the user with the new conference ID. By default, emails are sent to users, but this can be turned off.

> **NOTE**
> After you reset the conference ID, an email with the new conference ID will be sent to the user. This email will be sent to the primary email address, in many cases, their Microsoft 365 or Office 365 mailbox. The email contains the new conference ID, default dial-in phone number(s) and instructions for updating existing meetings.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

What else should I know?

- You can send all of the conferencing information to the user in an email that includes the conference ID and dial-in phone numbers by clicking **Send conference info in email** for the user in the **Audio Conferencing** section. It doesn't send the PIN.
- A 7- 9 digit conference ID is created by the Teams service. You can't change its length.
- After it has been reset, you can see the new conference ID listed under **Conference ID**.
- After a new conference ID is created, the old conference ID can't be used by callers. You should notify users to reschedule their existing meeting invites to make sure the new conference ID is added to the invitations.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Reset the Audio Conferencing PIN

Reset the Audio Conferencing PIN in Microsoft Teams

6/9/2020 • 3 minutes to read • Edit Online

A PIN is a code made up of numbers that is created for each Microsoft Teams user who is enabled for audio conferencing. Audio conferencing PINs are used by meeting organizers to identify that they are the meeting organizer and allow them to start a meeting over the phone. If they use the Microsoft Teams app to start the meeting, a PIN isn't required. If users forget their PIN and they can't find it in the email that was sent to them when they were enabled for audio conferencing, an administrator can reset their PIN, or they can reset their own PIN.

Meetings can be started when an authenticated user joins using the Microsoft Teams app or when the organizer joins with his or her PIN over the phone. When a meeting requires a PIN to start, users who join over the phone will be placed in the lobby and will listen to music on hold until the meeting starts. If the organizer of a meeting doesn't require a PIN to start the meeting over the phone, then callers won't be asked to provide a PIN when they join the meeting.

Reset a user's PIN

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Click **Edit**.
3. Under **Audio Conferencing**, click **Reset PIN**.
4. Click **Reset**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Have a user reset his or her own PIN

1. Have the user go to https://admin0m.online.lync.com/lscp/usp/pstnconferencing.
2. Click **Reset PIN**.

What else should you know about PINs?

- For security purposes, the PIN is only shown to an administrator on one time, when the PIN is reset. After the PIN is reset by an administrator, the PIN will be listed as **********.
- Automatically sending emails to users is enabled by default, and users will receive an email with their PIN when they're enabled for audio conferencing or when the PIN is reset. But if you have disabled automatically sending emails, a PIN reset email won't be sent to a user and you will have to manually send the PIN information to the user.
- When a meeting starts, all of the users in the lobby will automatically join it. For example, if two participants try to join a meeting before it has been started, they will be put in the lobby and will listen to music on hold, and when the meeting organizer joins using his PIN via phone, the meeting will start and

the participants in the lobby will join the meeting.

- The default setting is to not allow a meeting to be started by anonymous callers.
- When you enable a user for audio conferencing, by default they are sent emails that include conferencing information and their PIN. The user must have a Microsoft 365 or Office 365 mailbox, because when a PIN is reset, a new PIN will be sent to the user in email to their primary SMTP address (alias) that is set for the user.
- When you set up audio conferencing, you set the digits that are required for the PINs in your organization. PINs can be from 4 to 12 digits - the default is 5. If you change the PIN length setting, the setting is only applied on newly generated PINs and isn't applied to the PIN setting for existing users that are enabled for audio conferencing. See Set the length of the PIN for Audio Conferencing meetings.
- The email by default will be set to the Microsoft 365 or Office 365 primary SMTP address of the user. You can send an email to a non-Microsoft 365 or non-Office 365 address such as a Hotmail or MSN email address. You can override the default email address by using Windows PowerShell. This is useful if the users don't have an Exchange mailbox in Microsoft 365 or Office 365.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Reset a conference ID for a user

Emails sent to users when their settings change in Microsoft Teams

8/17/2020 • 3 minutes to read • Edit Online

Emails will be automatically sent to users who are enabled for Audio Conferencing using Microsoft as the audio conferencing provider.

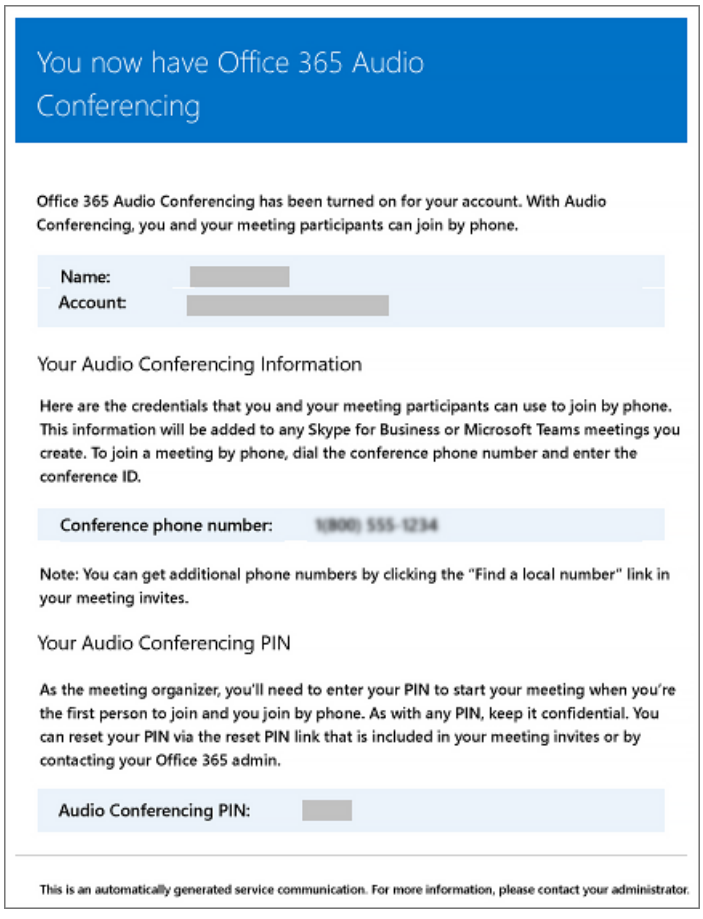
By default, there are four types of email that will be sent to your users who are enabled for Audio Conferencing. However, if you want to limit the number of emails sent to users, you can turn it off. Audio Conferencing in Microsoft 365 or Office 365 will send email to your users' email when:

- **An Audio Conferencing license is assigned to them or when you are changing the audio conferencing provider to Microsoft.**

  This email includes the conference ID, the default conference phone number for the meetings, the audio conferencing PIN for the user, and the instructions and link to use the Skype for Business Online Meeting Update Tool that is used to update existing meetings for the user. See Assign Microsoft Teams add-on licenses or Assign Microsoft as the audio conferencing provider.

  > **NOTE**
  > If your organization has been enabled for dynamic conference IDs, all of a user's meetings that they schedule will have unique conference IDs. You can set up Audio Conferencing dynamic IDs in your organization.

  Here is an example of this email:



You now have Office 365 Audio Conferencing

Office 365 Audio Conferencing has been turned on for your account. With Audio Conferencing, you and your meeting participants can join by phone.

Name:
Account:

Your Audio Conferencing Information

Here are the credentials that you and your meeting participants can use to join by phone. This information will be added to any Skype for Business or Microsoft Teams meetings you create. To join a meeting by phone, dial the conference phone number and enter the conference ID.

Conference phone number: 1(800) 555-1234

Note: You can get additional phone numbers by clicking the "Find a local number" link in your meeting invites.

Your Audio Conferencing PIN

As the meeting organizer, you'll need to enter your PIN to start your meeting when you're the first person to join and you join by phone. As with any PIN, keep it confidential. You can reset your PIN via the reset PIN link that is included in your meeting invites or by contacting your Office 365 admin.

Audio Conferencing PIN:

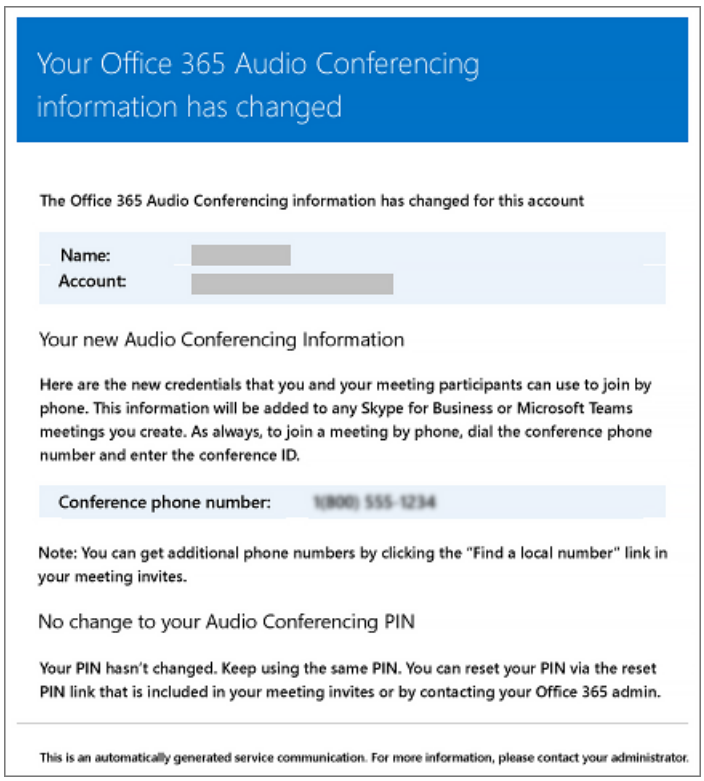
This is an automatically generated service communication. For more information, please contact your administrator.

To find out more about licensing, see Microsoft Teams add-on licensing.

- **The conference ID or default conference phone number of a user changes.**

  This email contains the conference ID, default conference phone number, and the instructions and link to use the Skype for Business Online Meeting Update Tool that is used to update existing meetings for the user. But this email doesn't include the user's audio conferencing PIN. See Reset a conference ID for a user.

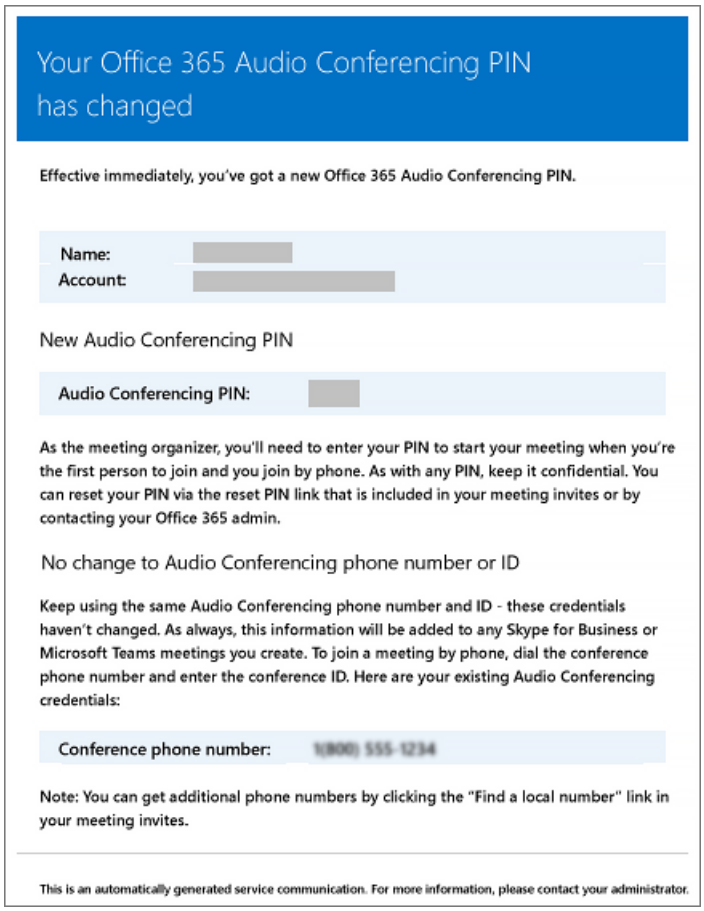
  Here is an example of this email:



- **The audio conferencing PIN of a user is reset.**

  This email contains the organizer's audio conferencing PIN, the existing conference ID, and default conference phone number for the user. See Reset the Audio Conferencing PIN.

  Here is an example of this email:

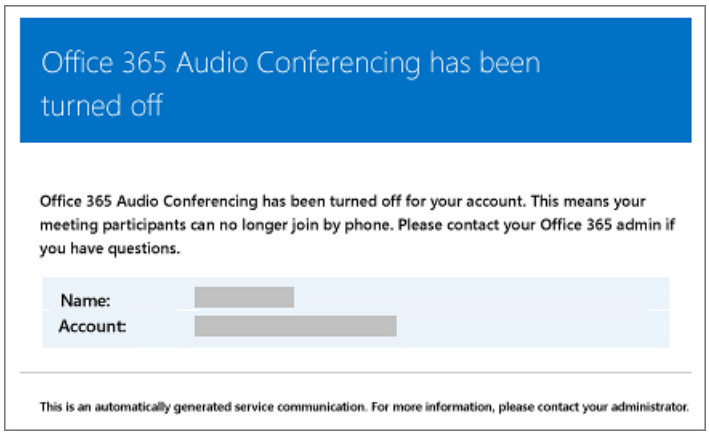


- **A user's license is removed or when audio conferencing provider changes from Microsoft to other provider or None.**

  This happens when the **Audio Conferencing** license is removed from a user or when setting the audio conferencing provider to **None**.

  See Assign or remove licenses for Microsoft 365 for business.

  Here is an example of this email:



> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Make changes to the email messages that are sent to them

You can make changes to the email that is automatically sent to users. By default, the sender of the emails will be from Microsoft 365 or Office 365, but you can change the display name using Windows PowerShell. See the

Microsoft Teams PowerShell reference for more information.

What if you don't want email to be sent to them?

When you disable sending emails to users, email won't be sent even when a user gets assigned a license. In this case, the conference ID, default conferencing phone number, and, more importantly, their audio conferencing PIN won't be sent to the user. When this happens, you must tell the user by sending them a separate email or by calling them.

By default, emails will be sent to your users, but if you want to prevent them from receiving email for audio conferencing, you can use Microsoft Teams or Windows PowerShell.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, enable or disable **Automatically send emails to users if their dial-in settings change**.
4. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

Want to know more about Windows PowerShell?

By default, the sender of the emails will be from Microsoft 365 or Office 365, but you can change the email address and display name using Windows PowerShell.

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Enable or disable sending emails when Audio Conferencing settings change

Send an email to a user with their Audio Conferencing information

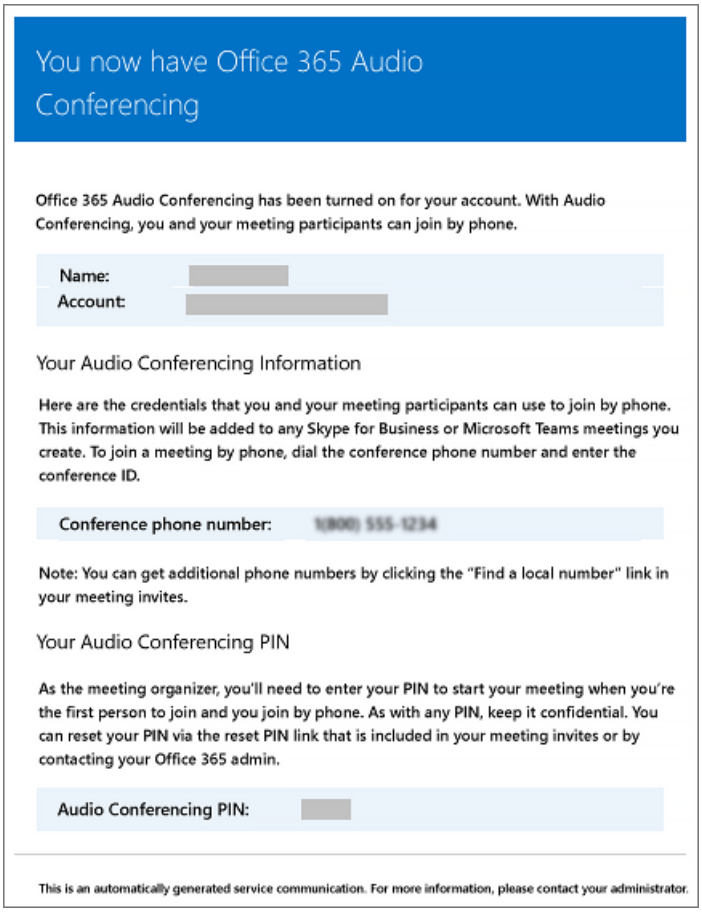
Enable or disable sending emails when Audio Conferencing settings change in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

Users are automatically notified by email when they are enabled for Audio Conferencing. There may be times, however, when you want to reduce the number of emails that are sent to Microsoft Teams users. In such cases, you can disable sending email.

If you disable sending emails, Audio Conferencing emails won't be sent to your users, including emails for when users are enabled or disabled for audio conferencing, when their PIN is reset, and when the conference ID and the default conferencing phone number changes.

Here is an example of the email that is sent to users when they are enabled for Audio Conferencing:


You now have Office 365 Audio Conferencing

Office 365 Audio Conferencing has been turned on for your account. With Audio Conferencing, you and your meeting participants can join by phone.

Name:
Account:

Your Audio Conferencing Information

Here are the credentials that you and your meeting participants can use to join by phone. This information will be added to any Skype for Business or Microsoft Teams meetings you create. To join a meeting by phone, dial the conference phone number and enter the conference ID.

Conference phone number: 1(800) 555-1234

Note: You can get additional phone numbers by clicking the "Find a local number" link in your meeting invites.

Your Audio Conferencing PIN

As the meeting organizer, you'll need to enter your PIN to start your meeting when you're the first person to join and you join by phone. As with any PIN, keep it confidential. You can reset your PIN via the reset PIN link that is included in your meeting invites or by contacting your Office 365 admin.

Audio Conferencing PIN:

This is an automatically generated service communication. For more information, please contact your administrator.

When are emails being sent to your users?

- There are several emails that are sent to users in your organization after they are enabled for audio conferencing:
  - When an **Audio Conferencing** license is assigned to them.
  - When you manually reset the user's audio conferencing PIN.
  - When you manually reset the user's conference ID.
  - When the **Audio Conferencing** license is removed from them.
  - When the audio conferencing provider of a user is changed from Microsoft to another provider or

None.

- When the audio conferencing provider of a user is changed to Microsoft.

Enable or disable email from being sent to users

You can use Microsoft Teams or Windows PowerShell to enable or disable email sent to users.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge settings**.
3. In the **Bridge settings** pane, enable or disable **Automatically send emails to users if their dial-in settings change**.
4. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Emails sent to users when their Audio Conferencing settings change

Send an email to a user with their Audio Conferencing information

Disabling toll-free numbers for specific Teams users

4/27/2020 • 2 minutes to read • Edit Online

If your organization has toll-free numbers in its Microsoft Audio Conferencing Bridge, you can allow or prevent their usage in the meetings of specific organizers.

By default, all users in your organization are enabled for using toll-free numbers, meaning that those numbers, if available, can be used by participants to join their meetings. If this is not the desired behavior for some users in your organization, you can restrict specific users from using those numbers in their meetings via a toll-free number enablement control.

When toll-free numbers are disabled for a given organizer:

- A toll-free number will no longer be included in his or her meeting invites.
- Toll-free numbers will no longer be listed on the "Find a local number" page that is referenced in his or her meeting invites.
- Participants won't be able to join the meeting of the given organizer if they dial any toll-free number of the organization.
- All meetings of the organizer will be automatically rescheduled, and the toll-free number will be removed from them.

  > **IMPORTANT**
  > This will resend all of the email invites of the organizer to all the participants of those meetings.

- Participants can continue joining meetings of the organizer using toll numbers.

Disabling toll-free numbers for specific users

From the **Microsoft Teams admin center**:

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. Next to **Audio Conferencing**, click **Edit**.
3. Set **Include toll-free numbers in meeting requests from this user** to **Off**.
4. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Using PowerShell

See the Microsoft Teams PowerShell reference for more information.

Outbound calling restriction policies for Audio Conferencing and user PSTN calls

12/5/2020 • 3 minutes to read • Edit Online

As an administrator, you can use outbound call controls to restrict the type of audio conferencing and end user PSTN calls that can be made by users in your organization.

Outbound call controls can be applied on a per-user basis and provide the following two controls to independently restrict each type of outbound calls. By default, both controls are set to allow international and domestic outbound calls.

CONTROL	DESCRIPTION	CONTROL OPTIONS
Audio Conferencing PSTN calls	Restricts the type of outbound calls that are allowed from within meetings organized by a user.	Any destination (default) In the same country or region as the organizer Zone A countries or regions only Don't allow
End user PSTN calls	Restricts the type of calls that can be made by a user.	International and Domestic (default) Domestic None

To find out which countries and regions are considered Zone A, see Country and region zones for Audio Conferencing.

> **NOTE**
> A call is considered domestic if the number dialed is in the same country where Microsoft 365 or Office 365 has been set up for the organizer of the meeting (in the case of audio conferencing), or the end user (in the case of end user PSTN calls).

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Restrict audio conferencing outbound calls

Using the Microsoft Teams admin center

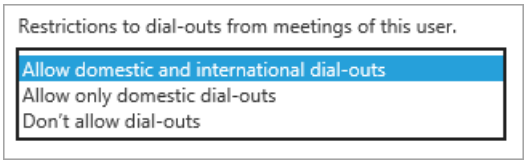
1. In the left navigation, click **Users**, and then click the display name of the user from the list of available users.
2. Next to **Audio Conferencing**, click **Edit**.
3. Under **Dial-out from meetings**, select the dial-out restriction option you want.
4. Click **Save**.

Using the Skype for Business admin center

1. In the **Skype for Business admin center**, in the left navigation, go to **Audio conferencing** > **Users**, and

then select the user from the list of available users.

2. In the Action pane, click **Edit**.
3. Under **Restrictions to dial-outs from meetings of this user**, select the dial-out restriction option you want.



4. Click **Save**.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Using PowerShell

Outbound call restrictions are controlled by a single policy called OnlineDialOutPolicy which has a restriction attribute for each. The policy cannot be customized, rather there are pre-defined policy instances for each combination of the settings.

You can use the Get-CSOnlineDialOutPolicy cmdlet to view the outbound calling policies and assign them to users by using the Grant-CSDialOutPolicy cmdlet. (Please note that the Grant cmdlet doesn't contain the word "Online" as the Get cmdlet does.)

The following table provides an overview of each policy.

Identity='tag:DialoutCPCandPSTNInternational'	User in the conference can dial out to international and domestic numbers, and this user can also make outbound calls to international and domestic numbers.
Identity='tag:DialoutCPCDomesticPSTNInternational'	User in the conference can only dial out to domestic numbers, and this user can make outbound calls to international and domestic numbers.
Identity='tag:DialoutCPCDisabledPSTNInternational'	User in the conference cannot make any dial out. This user can make outbound calls to international and domestic numbers.
Identity='tag:DialoutCPCInternationalPSTNDomestic'	User in the conference can dial out to international and domestic numbers, and this user can only make outbound calls to domestic PSTN number.
Identity='tag:DialoutCPCInternationalPSTNDisabled'	User in the conference can dial out to international and domestic numbers, and this user cannot make any outbound calls to PSTN number besides emergency numbers.
Identity='tag:DialoutCPCandPSTNDomestic'	User in the conference can only dial out to domestic numbers, and this user can only make outbound call to domestic PSTN numbers.
Identity='tag:DialoutCPCDomesticPSTNDisabled'	User in the conference can only dial out to domestic numbers, and this user cannot make any outbound calls to PSTN number besides emergency numbers.

Identity='tag:DialoutCPCDisabledPSTNDomestic'	User in the conference cannot make any dial out, and this user can only make outbound call to domestic PSTN numbers.
Identity='tag:DialoutCPCandPSTNDisabled'	User in the conference cannot make any dial out, and this user cannot make any outbound calls to PSTN number besides emergency numbers.
Identity='tag:DialoutCPCZoneAPSTNInternational'	User in the conference can only dial out to Zone A countries and regions, and this user can make outbound calls to international and domestic numbers.
Identity='tag:DialoutCPCZoneAPSTNDomestic'	User in the conference can only dial out to Zone A countries and regions, and this user can only make outbound calls to domestic PSTN number.
Identity='tag:DialoutCPCZoneAPSTNDisabled'	User in the conference can only dial out to Zone A countries and regions, and this user cannot make any outbound calls to PSTN number besides emergency numbers.

View and reset a conference ID assigned to a user in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

A conferencing ID is automatically assigned to a Microsoft Teams user when they are set up for Audio Conferencing in Microsoft 365 or Office 365 and use Microsoft as the audio conferencing provider. The conference ID assigned is sent in the meeting invite when the meeting is scheduled. Each meeting that a user schedules will get assigned a unique conference ID.

Although a conference ID will be automatically created and assigned to a user, there may be times when a user doesn't want to use this one and you want to set it to a certain number, or when your users can't remember or have lost their conference ID. You can use Microsoft Teams admin center or Windows PowerShell to view, change, and reset their conference ID.

An email will be sent to the user with the conference ID and the default audio conferencing phone numbers, or if you reset the conference ID a different email will be sent that will include the conference ID but not a PIN. See Reset a conference ID for a user in Microsoft Teams for more information about how to reset a conference organizer's PIN.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

View and reset conference IDs

To view the conference ID

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. At the top of the page, click **Edit**.
3. Under **Audio Conferencing**, look under **Conference ID**.

> **TIP**
> You can send all of the conferencing information to the user in an email that includes the conference ID and audio phone numbers by clicking the **Send conference info in email** link.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

To reset the conference ID

You can reset a conference ID for a user if, for example, they forget it.

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.

2. At the top of the page, click **Edit**.
3. Under **Audio Conferencing**, click **Reset conference ID**.
4. In the **Reset conference ID** window, click **Reset**. A conference ID will be automatically created and an email sent to the user with the new conference ID.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

What else should you know?

> **IMPORTANT**
> After a new conference ID is created or one is reset, the old conference ID can't be used by callers. You should notify users to reschedule their existing meeting invites to make sure the new conference ID is added to the invitations.

- The conference ID must meet the length in digits set on the audio conferencing bridge. You can't use alphabetic or special characters in conference IDs; only numbers can be used.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

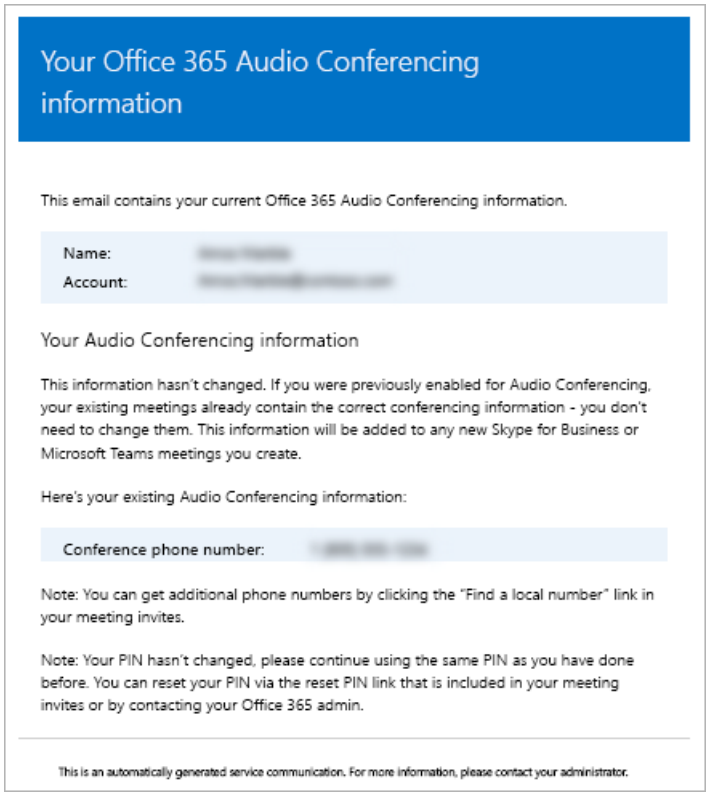
Send an email to a user with their Audio Conferencing information in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

Sometimes Microsoft Teams users may need you to send them their Audio Conferencing information. You can do this by clicking **Send conference info via email** under the properties for a user. When you send this email, it will contain all of the audio conferencing information, including:

- The conference phone or dial-in phone number for the user.
- The user's conference ID.

Here is an example of the email that is sent:



> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Send an email with audio conferencing information to a user

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, and then select the user from the list of available users.
2. At the top of the page, click **Edit**.
3. Under **Audio Conferencing**, click **Send conference info in email**.

What else should you know about this email?

- There are several emails that are sent to users in your organization after they are enabled for audio conferencing:
  - When an **Audio Conferencing** license is assigned to them.
  - When you manually reset the user's audio conferencing PIN.
  - When you manually reset the user's conference ID.
  - When an **Audio Conferencing** license is removed from them.
  - When the audio conferencing provider for a user is changed from Microsoft to another provider or **None**.
  - When the audio conferencing provider for a user is changed to Microsoft.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

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- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Dialing out from a Microsoft Teams meeting so other people can join it

8/17/2020 • 2 minutes to read • Edit Online

As the meeting organizer, you can dial out using the Teams app to let other people join the same meeting using their phones.

When you dial out to someone, we recommend that you do so using their full phone numbers (including the country/region code - E.164 format).

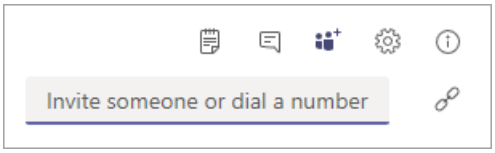
Please note that:

- You can dial out only if you join a meeting using Teams.
- The meeting organizer, has been enabled for audio conferencing, OR, in the case no audio conferencing license is assigned, is allowed to make calls to the public switched telephone network via online calling plans or direct routing.
- The meeting organizer is Granted an online dial out policy that enables dial out from conferencing enabled

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Here's how to get dial out to work:

Step 1: In the meeting, use the **Add people**  option to dial out to a phone number. **Step 2:** Enter the full phone number, including the country/region code in the **Invite someone or dial a number** box.



Supported countries and regions

Dial-out is only available to some countries/regions. For complete list, see Country and region availability for Audio Conferencing and Calling Plans.

Allow users to dial in

If you are looking for instructions on how to let your users dial in to a Teams meeting, please see Phone numbers for Audio Conferencing in Microsoft Teams.

Want to know more about audio conferencing?

Try or purchase Audio Conferencing

Microsoft Teams add-on licensing

Turn on or off entry and exit announcements for meetings in Microsoft Teams

7/22/2020 • 2 minutes to read • Edit Online

When you are setting up Audio Conferencing in Microsoft 365 or Office 365, you will get an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers that people will use to call in to a Microsoft Teams meeting.

The conferencing bridge answers a call for a user who is dialing in to a meeting using a phone. The conferencing bridge answers the caller with voice prompts from a conferencing auto attendant, and then, depending on your settings, can play notifications, ask callers to record their name, and set up the PIN security. A PIN is given to a Microsoft Teams meeting organizer, and it allows them to start a meeting if they can't start the meeting using the Microsoft Teams app. You can, however, set it so that a PIN isn't required to start a meeting.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Setting meeting join options

Using the Microsoft Teams admin center

You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

1. Log in to the admin center.
2. In the left navigation, go to **Meetings** > **Conference Bridges**.
3. At the top of the **Conference Bridges** page, click **Bridge Settings**.
4. In the **Bridge settings** pane, enable or disable **Meeting entry and exit notifications**. This is selected by default. If you clear it, users who have already joined the meeting won't be notified when someone enters or leaves the meeting.
5. Under **Entry/exit announcement type**, select **Names or phone numbers** or **Tones**.

   > **NOTE**
   > By default, external participants can't see the phone numbers of dialed-in participants. If you want to maintain the privacy of these phone numbers, select **Tones** for **Entry/exit announcement type** (this prevents the numbers from being read out by Teams).

6. If you chose **Names or phone numbers**, enable or disable **Ask callers to record their name before joining the meeting**.
7. Click **Save**.

Want to know more about Windows PowerShell

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows

PowerShell, you can manage Microsoft 365 or Office 365 using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Microsoft 365 or Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Audio Conferencing common questions

Set the PIN length for Audio Conferencing meetings in Microsoft Teams

6/10/2020 • 2 minutes to read • Edit Online

When you are setting up audio conferencing for Microsoft Teams, you will get an audio conferencing bridge. A conferencing bridge can contain one or more phone numbers. The phone number you set will be included on the meeting invites for the Microsoft Teams app.

The audio conferencing bridge answers a call for people who are dialing in to a meeting using a phone. It answers the caller with voice prompts from an auto attendant and then, depending on your settings, can play notifications and ask callers to record their name. **Microsoft bridge settings** allow you to change the settings for meeting notifications and the meeting join experience, and set the length of the PINs that are used by meeting organizers. Meeting organizers use PINs to start meetings if they can't join the meeting using the Microsoft Teams app.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Setting the PIN length

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Conference Bridges**.
2. At the top of the **Conference Bridges** page, click **Bridge Settings**.
3. In the **Bridge settings** pane, under **PIN length**, select the number of digits you want for the PIN.
4. Click **Save**.

> **NOTE**
> A PIN is different from a conference ID. Conference IDs are used by callers when they join the meeting. They are used to identify the meeting. The PIN is used to authenticate a caller as the meeting organizer.

Want to know more about PIN settings?

- PINs can be from 4 to 12 digits; the default is 5. Numbers are only used when creating PINs. Letters and special characters aren't used.
- A PIN is only required for the meeting organizer when a Microsoft Teams user hasn't already started the meeting. If everyone is dialing in to the meeting, then the PIN is required for the meeting organizer to start the meeting.
- PIN security settings are applied to all of the phone numbers that are associated with a Microsoft bridge. They will be applied to all meetings that use the phone numbers associated with a given bridge.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows

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Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Set the phone numbers included on invites in Microsoft Teams

7/22/2020 • 3 minutes to read • Edit Online

Audio Conferencing in Microsoft 365 and Office 365 enables users in your organization to create Microsoft Teams meetings, and then allow users to dial in to those meetings using a phone.

A conferencing bridge gives you a set of dial-in phone numbers for your organization. All of them can be used to join the meetings that a meeting organizer has created, but you can select which ones will be included on their meeting invites.

> **NOTE**
> There can be a maximum of one toll and one toll-free phone number on the meeting invite for a meeting organizer, but there is also a link located at the bottom of each meeting invite that opens the full list of all dial-in phone numbers that can be used to join a meeting.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Initial assignment of phone numbers that are included in the meeting invites for new users

The phone numbers that get included in the meeting invites of users enabled for Audio Conferencing are defined by the default conferencing toll phone number and the default conferencing toll-free phone number user's settings. Each setting specifies which toll and toll-free number will be included in the meeting invite of a given user. As noted above, each meeting invite contains one toll number, one optional toll-free number and a link that opens the full list of all dial-in phone numbers that can be used to join a given meeting.

For a new user, the default conferencing toll numbers is assigned based on the Usage Location that is set in the Microsoft 365 administration center of the user when the user is enabled for the Audio Conferencing service. If there is a toll number in the conference bridge that matches the country of the user, that number will be automatically assigned as the default toll number of the user. If there isn't one, the number that is defined as the default toll number of the conference bridge will be assigned as the default toll number of the user.

Once the user is enabled for the Audio Conferencing service, the default toll and toll-free phone numbers of the user can be changed by the tenant administrator from their initial values at any moment.

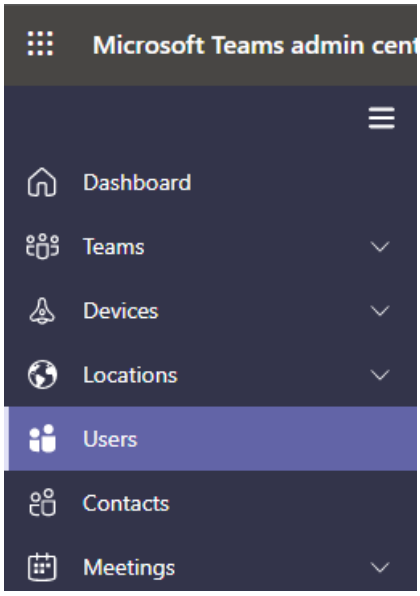
Set or change the default audio conferencing phone number for a meeting organizer or user

Using the Microsoft Teams admin center

You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

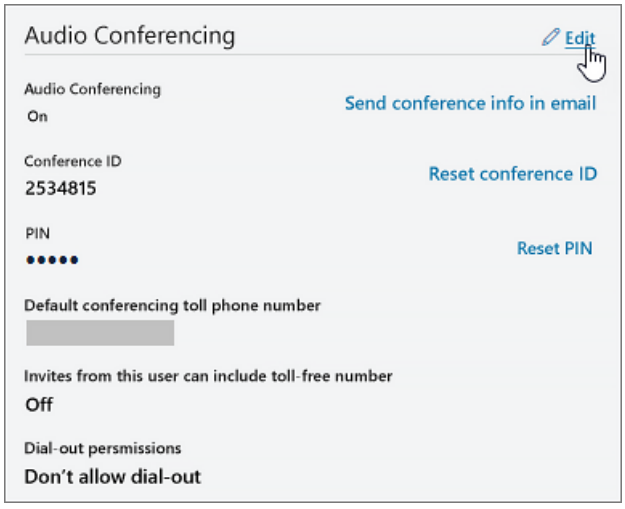
1. Log in to the Microsoft Teams admin center.

2. In the left navigation, click **Users**.



3. Click the user name from the list of available users.

4. Next to **Audio Conferencing**, click **Edit**.



5. Use the **Toll number** or **Toll-free number** fields to enter the numbers for the user.

> **IMPORTANT**
> When you change a user's audio conferencing settings, recurring and future Microsoft Teams meetings must be updated and sent to attendees.

Want to use Windows PowerShell

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

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For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Change the phone numbers on your Audio Conferencing bridge

Start an Audio Conference over the phone without a PIN in Microsoft Teams

6/10/2020 • 3 minutes to read • Edit Online

It might be frustrating for users who dial in to a meeting to be held in the meeting's lobby listening to music because the Microsoft Teams meeting organizer hasn't started the meeting.

If a meeting organizer calls in to the meeting, by default, a PIN is required to start a meeting. You can set it up so that anyone can dial in to a meeting and not be prompted for a PIN to start the meeting. You can use the admin center to enable or disable this setting for a single user.

A PIN isn't required for the meeting organizer if someone has started the meeting from the Microsoft Teams app. A PIN is only required when a meeting organizer joins their meeting over a phone. The PIN for meetings is sent to the audio user when they are assigned the **Audio Conferencing** license and are enabled for Audio Conferencing. See Send an email to a user with their Audio Conferencing information and Emails that are automatically sent to users when their Audio Conferencing settings change.

> **NOTE**
> We are frequently updating how you can manage features, so the steps here might be a little different from what you see.

Enable or disable anonymous callers from joining a meeting

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**.
2. Select a user in the list, and then click **Edit** at the top of the page.
3. Next to **Audio Conferencing**, click **Edit**.
4. In the **Audio Conferencing** pane, enable or disable **Dial-in callers can be the first person in a meeting**.
5. Click **Apply**.

Using Windows PowerShell

See the Microsoft Teams PowerShell reference for more information.

What else should you know?

- If you want to reset the PIN, see Reset the Audio Conferencing PIN.
- If anonymous access, or not requiring a PIN to start a meeting, is disabled:
  - If the meeting hasn't started (there's no one in the meeting yet): A caller will be prompted if he's the organizer; if he says yes, he'll be prompted for his PIN, and after he inputs the PIN, the meeting will start and the user will join the meeting.
  - If the meeting already started (someone else is already in the meeting): A caller won't be prompted if he's the organizer and he'll never be prompted for the PIN; the meeting is already started, and the

caller will join it.

- If anonymous access, or not requiring a PIN to start a meeting, is enabled:
  - If the meeting hasn't started (there's no one in the meeting yet): A caller won't be prompted if she's the organizer, and she'll never be prompted for the PIN. Because the setting of the organizer is set to off, the meeting will start and the anonymous callers will join the meeting.
  - If the meeting already started (someone else is already in the meeting): A caller won't be prompted if she's the organizer, and she'll never be prompted for the PIN,,the meeting is already started, and the caller will join it.

Want to know more about Windows PowerShell?

Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:

- Why you need to use Office 365 PowerShell
- Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell

For more information about Windows PowerShell, see the Microsoft Teams PowerShell reference for more information.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Country and region availability for Audio Conferencing and Calling Plans

11/2/2020 • 7 minutes to read • Edit Online

You can select a country or region to see what cloud voice features are available to your organization.

Select your country or region to see what's available for your organization

If you're looking for a spreadsheet with all countries and regions, download and save the Cloud voice feature country/region availability spreadsheet.

After you've verified if one of the Skype for Business or Microsoft Teams services are available, you can see Skype for Business and Microsoft Teams add-on licensing to help you buy licenses and assign them to your users.

> **NOTE**
> If you need to get more telephone numbers for your users, see Getting phone numbers for your users or, for phone number request forms, Manage phone numbers for your organization.

Want to learn more about these services

Audio Conferencing

Sometimes people in your organization will need to use a phone to call in to a meeting. Skype for Business and Microsoft Teams includes the Audio Conferencing feature for just this situation! People can call in to meetings using a phone instead of using the Skype for Business and Microsoft Teams apps on a mobile device or PC. When you've decided that you want Audio Conferencing for your organization, buy one **Audio Conferencing** license for each person in your organization who is going to schedule/host an audio meeting.

With Audio Conferencing, there are toll and toll free phone numbers that can be used by your users to dial in to meetings. Toll numbers from the following countries or regions are automatically assigned as shared audio conferencing numbers to organizations when they're enabled for Audio Conferencing. Dedicated toll and toll free numbers can be assigned to your organization from additional cities.

> **IMPORTANT**
> There isn't a resource that contains a listing of all of the dial-in numbers for Audio Conferencing. To find out if there are dial-in phone numbers available in your area or country/region, go to **Skype for Business admin center** > **Voice** > **Phone Numbers**, click **Add**, and then click **New Service Numbers**. Use the lists for **Country/Region**, **State/Region**, and **City** to filter your search. If you are looking for toll free service numbers, select **toll free** from the **State/Region** list.

To see more about Audio Conferencing, see Audio Conferencing common questions

Pricing for Audio Conferencing

Using the Call Me feature or when adding other people to a meeting so they can join it

In Audio Conferencing, the "*Call Me*" feature is used to let other people join a dial-in meeting. Use the drop-down list in this article to search for the country/region and see if this feature is available.

Caution

Dialing out to toll free or free phone numbers may not be possible, because some toll free numbers only function from within a certain country or area within a country. For example, if you dial out from the United States to a toll free number in Brazil, the call may not be successful because the call didn't originate from within Brazil or from a specific region within Brazil. The ability to dial out to toll free numbers varies widely depending on the restrictions of the toll free number dialed. Unfortunately, we can't control this behavior, and as a result, your experience may vary depending on the toll free number dialed and the restrictions of the toll free number.

Dialing out from a meeting to another country/region in the world that isn't listed below is available using Communication Credits. For those users, you'll need to Set up Communications Credits for your organization.

Phone System

With Phone System, you create auto attendants and call queues (with a toll or toll free number) to answer incoming calls for your organization. When you add a Calling Plan for users, they can use Skype for Business to take care of basic call-control tasks, such as placing and receiving calls, transferring calls, and muting and unmuting calls. **Phone System** users click a name in their address book, and Skype for Business will place a call to that person. To place and receive calls, **Phone System** users use their mobile devices, a headset with a laptop or PC, or one of many IP phones that work with Skype for Business.

> The availability of toll phone numbers from some of these locations might vary at any given time depending on inventory levels. In addition to getting phone numbers for individual users, it's also possible to search and acquire toll or toll free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants and call queues. These are called service numbers. See Getting service phone numbers to get phone numbers. But for your users, after you assign a Calling Plan to them, you can assign a user phone number so they can make and receive phone calls. To find those phone numbers, go to Getting phone numbers for your users. You can also see Assign, change, or remove a phone number for a user.

Pricing for Phone System

> **NOTE**
> The availability of toll phone numbers from some of these locations might vary at any given time depending on inventory levels.

Use the drop-down list at the top of the page to search for a country or region and what services are available.

Calling Plans

Along with Phone System, a Calling Plans let users make and receive phone calls. You first get a user (subscriber) phone number (not a service number) to assign to the user, and then assign a Calling Plan. There are two types of Calling Plans available: **Domestic** and **Domestic and International**. See Phone System and Calling Plans for more details.

You can also see Phone System and Calling Plans licensing for licensing information.

> **NOTE**
> The country/region is based on the location of the user's license in the **Microsoft 365 admin center** > **Active Users** and **not** the billing address listed under the **Organization Profile** in the **Microsoft 365 admin center**.

Toll and toll free phone numbers for services

In addition to getting phone numbers for individual users, it's also possible to search and acquire toll or toll free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants, and call queues. These are called service numbers.

The following is a list of capitals and major cities from where you can get toll service numbers to use with Audio Conferencing and Calling Plans. You get toll service numbers from these locations using the **Skype for Business admin center**.

If you want to get a toll or toll free service number, you can see Getting service phone numbers. If you already have a toll or toll free service number that you want to transfer from a different provider, see Manage phone numbers for your organization.

Use the drop-down list at the top of the page to search for a country or region and what services are available.

Communications Credits

We recommend that you set up Communications Credits for your Audio Conferencing and Calling Plans users that need the ability to dial out to **any destination**. Many countries/regions are included, but some destinations might not be included in your Calling Plan or Audio Conferencing subscriptions.

If you don't set up Communications Credits and assign a license to users, and you run out of minutes for your organization (depending on your Calling Plan or Audio Conferencing plan or your country/region), they won't be able to make calls or dial out from meetings. You can find out more information including recommended funding amounts by reading What are Communications Credits?

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Audio Conferencing supported languages

6/8/2020 • 2 minutes to read • Edit Online

When you are setting up and configuring Audio Conferencing in Microsoft 365 or Office 365, you can select the primary and secondary (up to 4) languages that are used when callers dial in to a Skype for Business or Microsoft Teams meeting. Here is the list of supported languages for Audio Conferencing:

> **IMPORTANT**
> Primary and secondary languages can be changed only on dedicated Audio Conferencing phone numbers.

Currently supported languages

LANGUAGE	COUNTRY/REGION	CULTURE ID
Arabic	Saudi Arabia	ar-SA
Bulgarian	Bulgaria	bg-BG
Cantonese	Hong Kong	zh-HK
Chinese (Simplified)	China	zh-CN
Chinese (Traditional)	Taiwan	zh-TW
Croatian	Croatia	hr-HR
Czech	Czech Republic	cs-CZ
Danish	Denmark	da-DK
Dutch	Netherlands	nl-NL
English	Australia	en-AU
English	United Kingdom	en-GB
English	United States	en-US
Estonian	Estonia	et-EE
Filipino	Philippines	fil-PH
Finnish	Finland	fi-FL
French	Canada	fr-CA
French	France	fr-FR

LANGUAGE	COUNTRY/REGION	CULTURE ID
German	Germany	de-DE
Georgian	Georgia	ka-GE
Greek	Greece	el-GR
Hebrew	Israel	he-IL
Hindi	India	hi-IN
Hungarian	Hungary	hu-HU
Indonesian	Indonesia	id-ID
Italian	Italy	it-IT
Japanese	Japan	ja-JP
Korean	Korea	ko-KR
Latvian	Latvia	lv-LV
Lithuanian	Lithuania	lt-LT
Malay	Malaysia	ms-MY
Norwegian (Bokmal)	Norway	nb-NO
Polish	Poland	pl-PL
Portuguese	Brazil	pt-BR
Portuguese	Portugal	pt-PT
Romanian	Romania	ro-RO
Russian	Russia	ru-RU
Slovak	Slovakia	sk-SK
Slovenian	Slovenia	sk-SK
Spanish	Mexico	es-MX
Spanish	Spain	es-ES
Swedish	Sweden	sv-SE
Thai	Thailand	th-TH

LANGUAGE	COUNTRY/REGION	CULTURE ID
Turkish	Turkey	tr-TR
Ukrainian	Ukraine	uk-UA

If you are looking for countries or regions where you can purchase Audio Conferencing, see Country and region availability for Audio Conferencing and Calling Plans.

If you are looking for specific countries or regions that have phone numbers for Audio Conferencing, see Phone numbers for Audio Conferencing in Microsoft Teams or Phone numbers for Audio Conferencing in Skype for Business Online.

Want to know how to manage with Windows PowerShell?

- To save time or automate this, you can use the Get-CsOnlineDialInConferencingLanguagesSupported or Set-CsOnlineDialInConferencingServiceNumber cmdlets.
- Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 by using a single point of administration that can simplify your daily work when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:
  - Why you need to use Office 365 PowerShell
  - Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell
- Windows PowerShell has many advantages in speed, simplicity, and productivity over only using the Microsoft 365 admin center, such as when you are making settings changes for many users at one time. Learn about these advantages in the following topics:
  - An introduction to Windows PowerShell and Skype for Business Online
  - Using Windows PowerShell to manage Skype for Business Online
  - Using Windows PowerShell to do common Skype for Business Online management tasks

    > **NOTE**
    > The Windows PowerShell module for Skype for Business Online enables you to create a remote Windows PowerShell session that connects to Skype for Business Online. This module, which is supported only on 64-bit computers, can be downloaded from the Microsoft Download Center at Windows PowerShell Module for Skype for Business Online.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Phone numbers for Audio Conferencing in Microsoft Teams

6/9/2020 • 2 minutes to read • Edit Online

When you are setting up **Audio Conferencing** for Microsoft Teams, dial-in phone numbers are automatically assigned to your organization. To see the phone numbers that are assigned to your audio conferencing bridge, in the Microsoft Teams admin center, go to **Meetings** > **Conference bridges**. For more information, go to See a list of Audio Conferencing numbers.

Audio Conferencing coverage and pricing

For a complete list of all the countries/regions and cities where Audio Conferencing is available, see Country and region availability for Audio Conferencing and Calling Plans. For pricing information, see Pricing for Audio Conferencing.

Dial-in phone numbers in a meeting invite

When a Microsoft Teams user schedules a meeting in Outlook or Outlook Web App, the default audio conferencing number that is set for the user is included in the meeting invite. If you want to select a different default number for one or more users, you can change that by going to **Users**, selecting the user, and editing the user's Audio Conferencing settings. See Set the phone numbers included on invites.

Dial-in phone numbers set on an audio conferencing bridge

There are two types of audio conferencing phone numbers that can be assigned to your conferencing bridge: **Shared** and **Dedicated**. Both types of these numbers can be used by any caller to join audio meetings that are being held in your organization.

- **Dedicated phone numbers** are those phone numbers that are only available to users within your organization. You can change the languages that are used when someone calls in to one of these numbers.
- **Shared phone numbers** are those phone numbers that can be shared with other Microsoft 365 or Office 365. You can't change the languages that are used when someone calls in to one of these numbers.

While the default audio conferencing number that is assigned to an organizer is only included in the meeting invite, a caller can use any of the phone numbers that are assigned to your conferencing bridge to join a meeting. The list of phone numbers that can be used to join a meeting is available using the **Find a local number** link that is included on every meeting invite.

Automatically assigned audio conferencing phone numbers

Shared audio conferencing phone numbers are automatically assigned to organizations when they're enabled for audio conferencing. When the phone numbers are assigned, a phone number is assigned as the default phone number of the conferencing bridge. The phone number assigned as the default number of the bridge will be one from the country/region of the organization.

To see a list of those countries/regions that have phone numbers automatically assigned to organizations, see Country and region availability for Audio Conferencing and Calling Plans.

NOTE

The country or region location of your organization can be found by signing in to the **Microsoft 365 admin center** and looking under **Organization Profile**.

Caution

Due to limited availability of toll phone numbers in Venezuela, Indonesia, and United Arab Emirates (UAE), organizations from these countries/regions won't have an Audio Conferencing toll number automatically assigned to them. Toll-free numbers from these locations are available depending on available inventory.

What else should you know?

- To see the list of supported languages for audio conferencing, see Audio Conferencing supported languages.
- You can set up to four languages for each audio conferencing phone number - one primary and three secondary. And you can also set languages on a dedicated audio conferencing phone number.
- To set the dial-in phone number for a user, see Set the phone numbers included on invites.

Related topics

Try or purchase Audio Conferencing in Microsoft 365 or Office 365

Country and region zones for Audio Conferencing

12/5/2020 • 2 minutes to read • Edit Online

This article lists the country and region zones for Audio Conferencing.

Zone A countries and regions

COUNTRY OR REGION
Australia
Austria
Belgium
Brazil
Bulgaria
Canada
China
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hong Kong
Hungary
India
Ireland
Italy

COUNTRY OR REGION
Japan
Luxembourg
Malaysia
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Puerto Rico
Romania
Russia
Singapore
Slovak Republic
Slovenia
South Africa
South Korea
Spain
Sweden
Switzerland
Taiwan
Thailand
United Kingdom
United States

Related topics

- Country and region availability for Audio Conferencing and Calling Plans
- Audio Conferencing complimentary dial-out period
- Audio Conferencing subscription "Dial-Out"/"Call Me At" minutes benefit
- Outbound calling restriction policies for Audio Conferencing and user PSTN calls
- What are Communications Credits?

Cloud Video Interop for Microsoft Teams

11/2/2020 • 6 minutes to read • Edit Online

Cloud Video Interop (CVI) is a Microsoft Qualified third-party solution that enables third-party meeting rooms (telepresence) and personal video devices (VTCs) to join Microsoft Teams meetings.

With Microsoft Teams, you get rich online content collaboration in meetings that include audio, video, and content sharing. This can be enjoyed through the desktop and web client, as well as through many partner devices that integrate natively with Microsoft Teams. However, many customers have already invested in video teleconferencing and personal video communication devices, which can be expensive to upgrade. Cloud Video Interop provides an easy solution, allowing you to keep using your existing solutions until you are ready to upgrade.

With Cloud Video Interop, Microsoft Teams delivers a native meeting experience for all participants – in meeting rooms or inside of Teams clients.

Is Cloud Video Interop for me?

Cloud Video Interop provides an intermediate service while you transition to a full native Microsoft Teams Solution, using Teams endpoints. The service provided should be part of your migration path.

Cloud Video Interop is intended for customers who meet the following criteria:

- Have a large deployment of meeting room devices and personal video devices deployment (50+ devices) that are not qualified for direct integration with Microsoft Teams
- Are supported by one of our Cloud Video Interop partners
- Want to retain the value of their investment in their current meeting room devices and personal video devices during the migration to a native Microsoft Teams solution

While Cloud Video Interop provides a great intermediate solution, we encourage our customers to look into our native Teams Meeting solutions, such as Teams Room Systems, for the long term.

Office 365 US Government and third-party services

Office 365 provides the ability to integrate third-party applications into SharePoint Online sites, Skype for Business, Teams, Office applications included in Microsoft 365 Apps for enterprise (such as Word, Excel, PowerPoint, and Outlook), and Outlook Web App. In addition, Office 365 supports integration with third-party service providers. These third-party applications and services might involve storing, transmitting, and processing your organization's customer data on third-party systems that are outside of the Office 365 infrastructure and therefore are not covered by the Office 365 compliance and data protection commitments. **It is recommended that you review the privacy and compliance statements provided by the third parties when assessing the appropriate use of these services for your organization.**

Partners Certified for Microsoft Teams

The following partners have video interop solutions for Microsoft Teams. Your company may choose to work with any combination of these partners within your enterprise.

PARTNER	PARTNER SOLUTION
poly	Polycom RealConnect Service
]pexip[	Pexip Infinity for Microsoft Teams

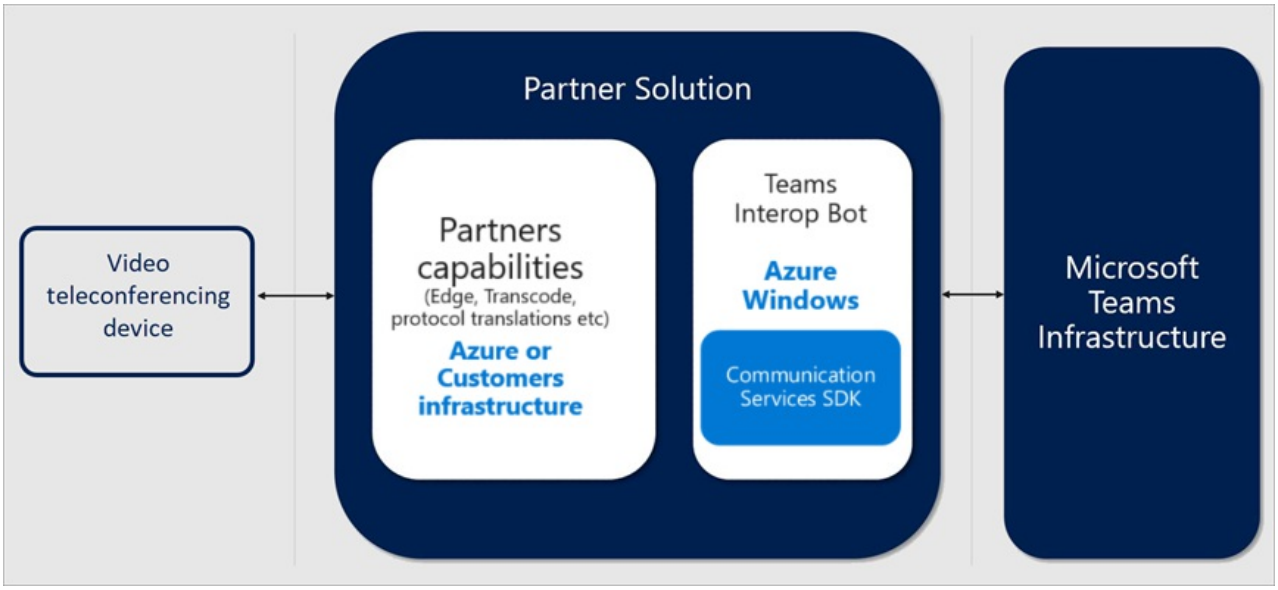
PARTNER	PARTNER SOLUTION
BlueJeans	BlueJeans Gateway for Microsoft Teams
cisco	Cisco Webex Video Integration for Microsoft Teams

Cloud Video Interop overview

Cloud Video Interop is a third-party service that is offered by our partners to provide interoperability between existing video conferencing and personal video device solutions on premises, and Microsoft Teams.

The solutions offered by our partners consist of components that can be deployed either fully cloud based or partially/fully on premises.

The following diagram shows the high-level architecture of our partner solutions.



Deploy Cloud Video Interop

When deploying a Cloud Video Interop solution, it's important to understand that you are deploying a partner solution. The general steps you should take to deploy Cloud Video Interop are listed in the following diagram.



Plan

During the plan phase, you should identify the devices that you will not replace with a native Teams device, and find a Cloud Video Interop partner that can support these devices.

It's also important to understand that you will need a license for each user who will schedule meetings in which you want a Cloud Video Interop-enabled device to join. Note that exact licensing requirements can be obtained from the Cloud Video Interop partner. Ensure that this is clear before you start your deployment.

Configure

The partner that you have chosen for your CVI deployment will provide you with a full deployment document that consists of all the steps needed to deploy successfully within your organization. This will include firewall ports and IP ranges, configuration changes for your devices, and other settings that need to change.

Provision

During the provision phase, you will assign licenses to the appropriate users according to the partner configuration guide. You will also need to go through the Azure Consent process to provide the partner access to your Teams environment. See Permissions and consent in the Microsoft identity platform endpoint for more information about the Azure consent process.

Schedule

After a user is enabled for Cloud Video Interop, any meeting scheduled using either the Teams Meeting Add-in for Outlook or the Teams Client will have the appropriate additional information automatically added into the Teams meeting so that Cloud Video Interop-compatible devices can join these meetings.

Join

Depending on the partner solution, there are several ways to join a Cloud Video Interop-enabled meeting. Exact meeting join scenarios will be provided by your Cloud Video Interop partner. We've listed some examples below:

- IVR (Interactive Voice Response)
  - You can dial in to the partner's IVR using the tenantkey@domain.
  - When you are in the partner IVR, you will be prompted to enter the VTC conferenceId, which will then connect you to the Teams meeting.
- Direct dial
  - You can directly dial in to the Teams meeting without interacting with the partner's IVR by using the direct dial feature, using the full string of tenantkey.VTC ConferenceId@domain.

- One-touch dial
  - If you have an integrated Teams room, you can use the one-touch dial capabilities offered by your partner (without needing to type any dial string).

Manage Cloud Video Interop

After Cloud Video Interop is deployed, you can manage the devices using the solutions provided by our partners. Each partner will provide you with an administrative interface that will include both license and device management.

Reporting is also available directly from the partner administrative interface. For more information on reporting capabilities, contact the partner of your choice.

Troubleshooting Cloud Video Interop

Cloud Video Interop is a partner-provided service. If you are experiencing issues, the first step is to connect a device that has the Teams Client installed and connect it to the same segment as the Cloud Video Interop device that is causing problems.

If Teams functions correctly on this segment, and you have also followed all the networking and configuration guidelines the partner has provided, you will need to contact the partner for further troubleshooting.

PowerShell for Cloud Video Interop

The following PowerShell cmdlets are available for you to (partially) automate the Cloud Video Interop deployment.

- **Get-CsTeamsVideoInteropServicepolicy**: Microsoft provides pre-constructed policies for each of our supported partners that allow you to designate which partner(s) to use for Cloud Video Interop.
  This cmdlet allows you to identify the pre-constructed policies that you can use in your organization. You can assign this policy to one or more of your users by leveraging the Grant-CsTeamsVideoInteropServicePolicy cmdlet.
- **Grant-CsTeamsVideoInteropServicePolicy**: This cmdlet allows you to assign a pre-constructed policy for use in your organization or assign the policy to specific users.
- **New-CsVideoInteropServiceProvider**: Use this cmdlet to specify information about a supported CVI partner that your organization would like to use.
- **Set-CsVideoInteropServiceProvider**: Use this cmdlet to update information about a supported CVI partner that your organization uses.
- **Get-CsVideoInteropServiceProvider**: Use this cmdlet to get all of the providers that have been configured for use within the organization.
- **Remove-CsVideoInteropServiceProvider**: Use this cmdlet to remove all provider information about a provider that your organization no longer uses.

What are Microsoft Teams live events

12/5/2020 • 5 minutes to read • Edit Online

Overview

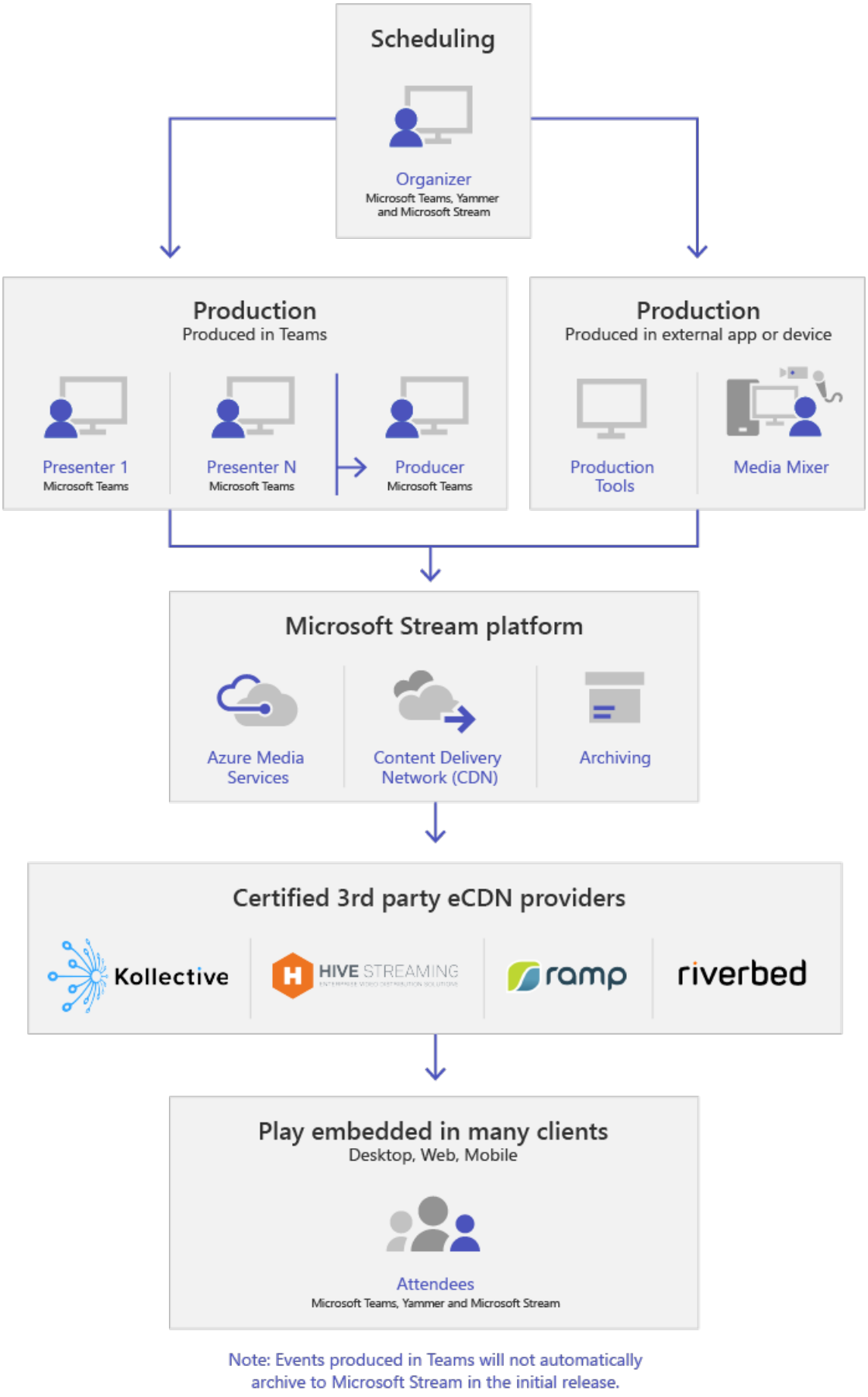
With Teams live events, users in your organization can broadcast video and meeting content to large online audiences.

Microsoft 365 live events bring live video streaming to a new level. Live events encourage connection throughout the entire engagement lifecycle with attendees before, during, and after live events. You can create a live event wherever your audience, team, or community resides, using Microsoft Stream, Teams, or Yammer.

Teams delivers chat-based collaboration, calling, meetings, and live events, so you can expand the audience of your meetings. Teams live events is an extension of Teams meetings, enabling users to broadcast video and meeting content to a large online audience. Live events are meant for one-to-many communications where the host of the event is leading the interactions and audience participation is primarily to view the content shared by host. The attendees can watch the live or recorded event in Yammer, Teams, and/or Stream and can interact with the presenters using moderated Q & A or a Yammer conversation.

Teams live events are considered the next version of Skype Meeting Broadcast and will eventually replace the capabilities provided in Skype Meeting Broadcast. At this point, Microsoft will continue to support Skype Meeting Broadcast for users who are using Skype for Business in their organizations, with no disruption in service for new or future events. However, we encourage you to try out Teams live events to leverage all the new and exciting features including screen sharing and support for external hardware/software encoders.

So, let's get started. First, take a look at the following diagram that shows high level components involved in Microsoft 365 live events and how they're connected.



Note: Events produced in Teams will not automatically archive to Microsoft Stream in the initial release.

Event group roles

Live events in Teams empowers multiple roles (organizer, producer, presenter, and attendee) to successfully broadcast and participate in an event. To learn more, see Event group roles.

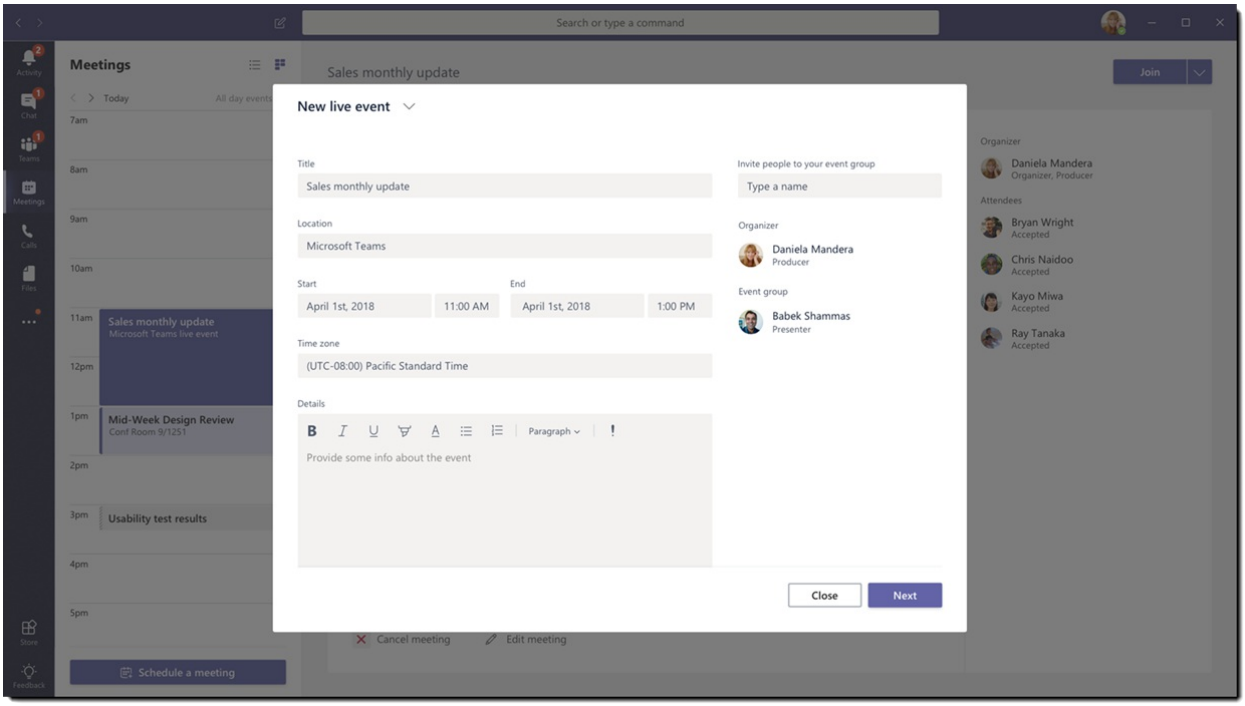
Key components

You can see from the picture above that there are five key components that are used with live events in Teams.

> **NOTE**
>
> For an overview of how to set up live events and the attendee experience, check out these short videos.

Scheduling

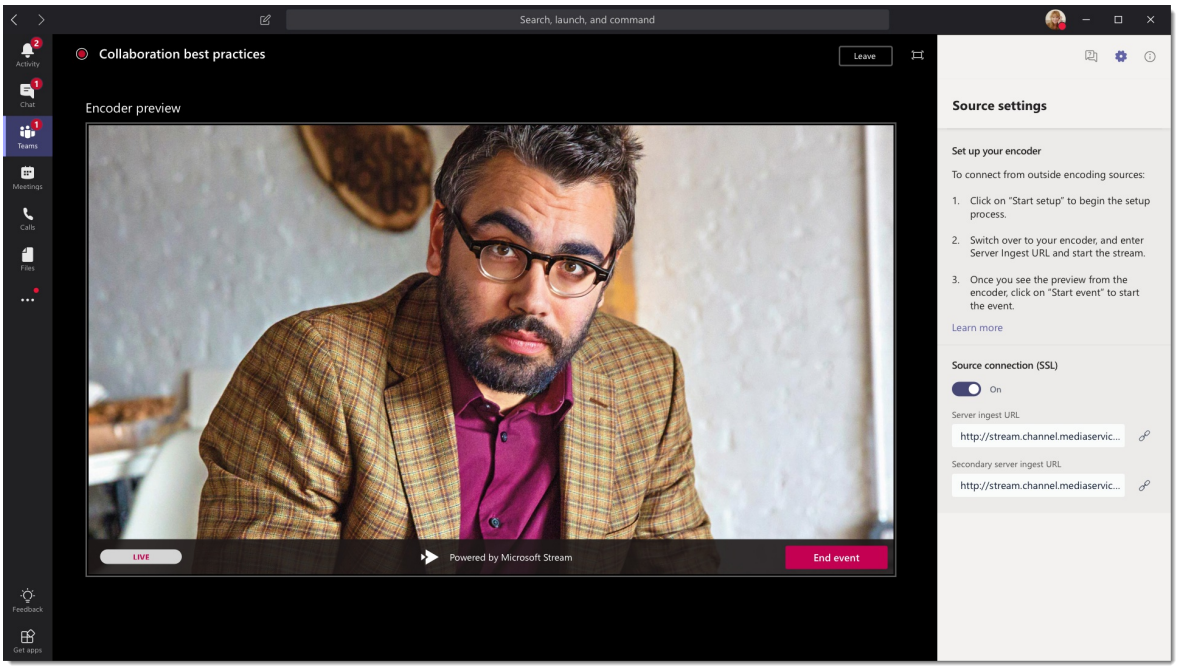
Teams provides the ability for the organizers to create an event with the appropriate attendee permissions, designate event team members, select a production method, and invite attendees. If the live event was created from within a Yammer group, the live event attendees will be able to use Yammer conversation for interacting with people in the event.



Production

The video input is the foundation of the live event and it can vary from a single webcam to a multi-camera professional video production. The live events in Microsoft 365 support a spectrum of production scenarios, include an event produced in Teams using a webcam or an event produced in an external app or device. You can choose these options depending on their project requirements and budget. There are two ways to produce events:

- **Teams**: This production method allows users to produce their live events in Teams using their webcam or using A/V input from Teams room systems. This option is the best and quickest option if you want to use the audio and video devices connected to the PC or are inviting remote presenters to participate in the event. This option allows users to easily use their webcams and share their screen as input in the event.
- **External app or device**: External encoders allow users to produce their live events directly from an external hardware or software-based encoder with Stream. This option is best if you already have studio quality equipment (for example, media mixers) which support streaming to a Real-time Messaging Protocol (RTMP) service. This type of production is typically used in large-scale events such as executive town halls – where a single stream from a media mixer is broadcasted to the audience.



> **NOTE**
>
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

Streaming platform

The live event streaming platform is made up of the following pieces:

- **Azure Media Services**: Azure Media Services gives you broadcast-quality video streaming services to reach larger audiences on today's most popular mobile devices. Media Services enhances accessibility, distribution, and scalability, and makes it easy and cost-effective to stream content to your local or worldwide audiences — all while protecting your content.
- **Azure Content Delivery Network (CDN)**: Once your stream goes live, it's delivered through the Azure Content Delivery Network (CDN). Azure Media Services provides integrated CDN for streaming endpoints. This allows the streams to be viewed worldwide with no buffering.

Enterprise Content Delivery Network (eCDN)

The goal of eCDN is to take the video content from the internet and distribute the content throughout your enterprise without impacting network performance. You can use one of the following certified eCDN partners to optimize your network for live events held within your organization:

- Hive
- Kollective
- Ramp
- Riverbed

Attendee experience

The attendee experience is the most important aspect of live events and it's critical that the attendees can participate in the live event without having any issues. The attendee experience uses Stream Player (for events produced in Teams) and Azure Media Player (for events produced in an external app or device) and works across desktop, browser, and mobile (iOS, Android). Microsoft 365 and Office 365 provide Yammer and Teams as two collaboration hubs, and the live attendee experience is integrated into these collaboration tools.



Live event usage report

Tenant admins can view real-time usage analytics for live events in Microsoft Teams admin center. The live event usage report shows the activity overview of the live events held in the organization. Admins can view event usage information, including event status, start time, views, and production type.

Next steps

Go to Plan for Teams live events.

Related topics

- Live events across Microsoft 365 in Yammer, Microsoft Teams, and Microsoft Stream
- Get started with Microsoft Teams live events
- Live events in Yammer
- Live events in Microsoft Stream

Plan for live events in Microsoft Teams

12/5/2020 • 6 minutes to read • Edit Online

When you're planning Teams live events to hold large meetings in your organization, there are several factors that you need to consider before starting the setup.

> **NOTE**
> For details about Teams live events on different platforms, see Teams features by platform. See prepare your organization to learn about bandwidth requirements for Teams live events.

Who can attend, create, and schedule live events

Anyone can attend a live event without a license. Read Admin quick start - Meetings and live events.

The following prerequisites are required for the user to schedule a Teams live event.

Here are the licenses that must be assigned to produce or present a Teams live event:

- A Microsoft or Office 365 Enterprise E1, E3, or E5 license or an Office 365 Education A3 or A5 license. The exception to this requirement is guest users can present without a license if the other criteria for guest users is met.
- A Microsoft Teams license - this is included in the licenses listed in the first bullet.
- A Microsoft Stream license - is required if you are planning to share the content to an external app or device; see Microsoft Stream licensing.

  Users won't need a Microsoft Stream license assigned if you want users to only record and download the recordings. This will mean that the recordings aren't stored in Microsoft Stream but are instead stored in Azure Media Services (AMS) with a 180-day limit before it's deleted. It's not something at this point that an admin can control or manage to include the ability to delete it.

> **NOTE**
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to OneDrive for Business and SharePoint for meeting recordings.

> **NOTE**
> At this time there aren't any Microsoft 365 Small Business plans that can be used to create and hold Teams live events.

It's important to know that a Microsoft 365 or Office 365 license is required to participate in a live event as an authenticated user, but this requirement depends on the production method used:

- **For events produced in Teams** The user must be assigned a Teams license.
- **For events produced with an external app or device** The user must be assigned a Stream license.

> **NOTE**
> Teams live events is now available for US Government Cloud Community (GCC) organizations.

For more information about licensing, see Microsoft Teams add-on licensing.

The user must have:

- Private meeting scheduling in Teams enabled (*The TeamsMeetingPolicy -AllowPrivateMeetingScheduling parameter = True*).
- Video sharing enabled in Teams meetings (*The TeamsMeetingPolicy -AllowIPVideo parameter = True*).
- Screen sharing enabled in Teams meetings (*The TeamsMeetingPolicy -ScreenSharingMode parameter = EntireScreen*).
- Live event scheduling in Teams enabled (*The TeamsMeetingBroadcastPolicy -AllowBroadcastScheduling parameter = True*).
- Permissions to create live events in Stream (for external app or device production).
- Coexistence mode configured to be able to schedule Teams meetings (*Islands, Meeting First, or Teams Only*).

> **IMPORTANT**
> Non-authenticated anonymous users can't be invited as producers or presenters in Teams live events.

Guest to present

For a guest to present in a live event, do the following:

1. Add the user as a guest to a team.
2. Have the user accept the guest invitation and join the team.
3. Schedule the live event and add the guest to your event group.

As a best practice, we recommend that you create a channel for producers and presenters of the live event so they can chat and share information before the event. Guests who don't have Microsoft 365 credentials won't see the Calendar in Teams. To make it easy for them to join the event, producers can post the event link to the channel. Presenters can then open Teams, go to the channel, and then click the link to join the event.

Who can watch live events

ATTENDEE VISIBILITY	TEAMS PRODUCTION	EXTERNAL APP OR DEVICE PRODUCTION
Public (anonymous users)	Yes	No
Guest users	Yes	No
Everyone in external access (federation) company	Yes[1]	No
Everyone in company	Yes	Yes
Specific groups / people	Yes	Yes

[1] External access (federation) attendees can only be invited through People & Group

Teams live events and Skype Meeting Broadcast

The following table highlights core capabilities and features offered in live events and how they differ from Skype Meeting Broadcast.

> **IMPORTANT**
>
> **Microsoft 365 live event limit increases**
>
> **To help support our customers, through January 1, 2021, we will extend temporary limit increases for live events hosted in Teams, Stream, and Yammer, including:**
>
> - Up to 20,000 attendees per event
> - Up to 50 simultaneous events per Teams tenant
> - Up to 16 hours per broadcast
>
> Additionally, live events with up to 100,000 attendees can be planned through the Microsoft 365 live events assistance program. The team will assess each request and work with you to determine options that may be available. Learn more.
> **After January 1, 2021, customers who need these limit increases will be required to purchase the Advanced Communications add-on.**

CAPABILITY	SKYPE MEETING BROADCAST	EVENTS PRODUCED IN TEAMS	EVENTS PRODUCED IN EXTERNAL APP OR DEVICE
Maximum audience size	10,000 attendees	10,000 attendees[1]	10,000 attendees[1]
Maximum duration of live event	4 hours	4 hours	4 hours
Maximum number of presenters and producers in a live event	10 [2]	10 [2]	10 [2]
Maximum number of concurrent live events per Microsoft 365 or Office 365 organization	15	15	15
Live event creation	Skype Meeting Broadcast Portal	Teams, Yammer via Teams	Teams, Yammer via Teams, Stream
Audience engagement – Yammer	✔	✔ (integrated experience)	✔ (integrated experience)
Audience engagement – Moderated Q & A	✔	✔	✔
Producer client on Windows	✔ (Skype for Business)	✔ (Teams)	✔ (Stream, Teams via Stream Embed)
Producer client on Mac	✘	✔ (Teams)	✔ (Stream, Teams via Stream Embed)
Attendee count in Producer UI	✘	✔ (Teams)	✔ (Stream, Teams via Stream Embed)

CAPABILITY	SKYPE MEETING BROADCAST	EVENTS PRODUCED IN TEAMS	EVENTS PRODUCED IN EXTERNAL APP OR DEVICE
Allows multiple presenters	✔ (Skype for Business)	✔ (Teams)	N/A
Invite a presenter during the meeting	✔ (Skype for Business)	✘	N/A
Presenter join on Web and Mobile	✔ (Skype for Business)	✘	N/A
External access (federation) & Guest presenters/attendees	✔ (Skype for Business)	✔ (Teams)	N/A
Presenter – PSTN access	✘	✔ (Teams)	N/A
Present a screen	✘	✔ (Teams)	N/A
Share system audio on Windows (available only when screen sharing)	✘	✔ (Teams)	✔
Present a PowerPoint (PPT sharing)	✔	✘ (mitigated via screen sharing)	N/A
Cloud based meeting recording	✔	✔	✔
Auto publish recording to Stream	✘	✘	✔
Live captions and subtitles	✔	✔	✘
Captions in live event recordings	✔	✔	✔
Attendee DVR controls (pause, rewind)	✔	✔	✔
Partner eCDN Support	✔ (Kollective, Hive, Riverbed)	✔ (Kollective, Hive, Riverbed)	✔ (Hive, Kollective, Ramp, Riverbed)
Post-broadcast attendance report for Producers	✔	✔	✘
Audience Sentiment Analysis – Live voting & polls	✔ (Microsoft Pulse)	✘	✘

[1] The limits that are set might be changed. Check Limits and specifications for Teams.

[2] You can have up to 100 presenters and producers in a live event, but only the last 10 who spoke show up in the list.

Regional availability

You can use Teams live events in multiple regions across the world. The following information shows availability

for event team members and attendees.

> **IMPORTANT**
> The region for the event is automatically selected depending on the organizer and the Microsoft 365 tenant location.

Available in these regional data centers

- North America
- Central America
- South America
- Asia Pacific
- Europe/Africa

Data location for these countries/regions (supported)

- Australia
- Canada
- India
- Japan
- United Kingdom

These countries/regions and clouds aren't supported

- Germany
- France
- Norway
- South Africa
- South Korea
- Switzerland
- UAE
- Government Community Cloud (GCC)-H
- DOD

Exclusions and considerations

- **Data location:** Teams data locations, outside of the ones listed above, are not currently supported.
- **China:** Event team members and attendees will not be able to use Teams live events because Azure CDN is not accessible in China. A workaround is to use a company VPN connection, which gets the client connected to CDN via the customer's corporate network.

Next steps

Go to Set up for Teams live events.

Related topics

- What are Teams live events?
- Set up for Teams live events
- Configure live events settings in Teams

Set up for live events in Microsoft Teams

12/5/2020 • 7 minutes to read • Edit Online

When you're setting up for live events, there are several steps that you must take.

Step 1: Set up your network for live events in Teams

Live events produced in Teams require you to prepare your organization's network for Teams.

Step 2: Get and assign licenses

Ensure you have correct license assignments for who can create and schedule live events and who can watch live events.

Step 3: Set up live events policies

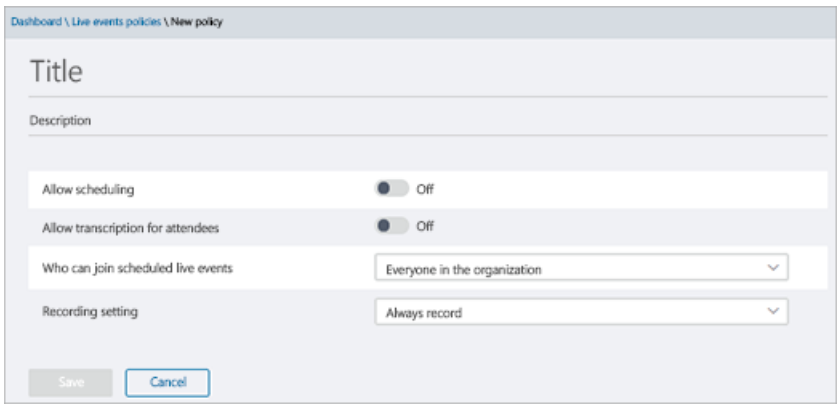
Live events policies are used to control who in your organization can hold live events and the features that are available in the events they create. You can use the default policy or create one or more custom live events policies. After you create a custom policy, assign it to a user or groups of users in your organization.

> **NOTE**
> Users in your organization will get the global (Org-wide default) policy unless you create and assign a custom policy. By default in the global policy, live event scheduling is enabled for Teams users, live captions and subtitles (transcription) is turned off, everyone in the organization can join live events, and the recording setting is set to always record.

Create or edit a live events policy

1. In the left navigation of the Microsoft Teams admin center, go to **Meetings** > **Live events policies**.
2. Do one of the following options:
   - If you want to edit the existing default policy, choose **Global (Org-wide default)**.
   - If you want to create a new custom policy, choose **Add**.
   - If you want to edit a custom policy, select the policy, and then choose **Edit**.

   Here are the settings you can change to fit the needs of your organization.



SETTING	DESCRIPTION
Title	This is the title of the policy that appears on the live events policies page. It can't be longer than 64 characters or have any special characters.
Description	Use this to add a friendly description for the policy.
Allow scheduling	Turning this on lets users in your organization create and schedule live events in Teams. It's important to know that if you want users to schedule a live event produced with an external app or device, there are additional steps you must do. To learn more, see Enable users to schedule events that were produced with an external app or device.
Allow transcription for attendees	This setting can only be applied to events produced in Teams. Turning this on enables live event attendees to see live captions and subtitles during the event.
Who can join scheduled live events	Choose one of the following. **Everyone** Users can create live events that everyone, including people outside your organization, can attend. This setting enables the **Public** permission type in Teams when a user schedules a live event. **Everyone in the organization** Users can create live events that people in your organization, including guest users added to your organization, can attend. Users can't create live events that are attended by anonymous users. This setting enables the **Org-wide** permission type in Teams when a user schedules a live event. **Specific users or groups** Users can create live events that only specific users or groups in your organization can attend. Users can't create live events that are attended by everyone in your organization or by anonymous users. This setting enables the **People and groups** permission type in Teams when a user schedules a live event.
Recording setting	This setting can only be applied to events produced in Teams. Choose one of the following. **Always record** Live events created by users are always recorded. After the event is over, event team members can download the recording and attendees can watch the event. **Never record** Live events created by users are never recorded. **Organizer can record or not** Users can decide whether to record the live event. If it's recorded, after the event is over, event team members can download the recording and attendees can watch the event.

You can also do this by using Windows PowerShell. For more information, see Use PowerShell to set live events policies in Teams.

Assign a live events policy to users

If you created a custom live events policy, assign it to users for the policy to be active.

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Enable users to schedule events that were produced with an external app or device

For users to schedule events produced with an external app or device, you must also do the following steps:

1. Enable Microsoft Stream for users in your organization. Stream is available as part of eligible Microsoft 365 or Office 365 subscriptions or as a standalone service. Stream isn't included in Business Essentials or Business Premium plans. See Stream licensing overview for more details.

   > **NOTE**
   > The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings. Learn more about how you can **assign licenses to users** so that users can access Stream. Ensure Stream isn't blocked for the users as defined in **this article**.

2. Ensure users have live event creation permission in Stream. By default, administrators can create events with an external app or device. Stream administrator can enable additional users for live event creation in Stream.

3. Ensure live event organizers have consented to the company policy set by Stream admin. If a Stream administrator has set up a company guidelines policy and requires employees to accept this policy before saving content, then users must do so before creating a live event (with an external app or device) in Teams. Before you roll out the live events feature in the organization, make sure users who will be creating these live events have consented to the policy.

Step 4: Set up a video distribution solution for live events in Teams

Playback of live event videos uses adaptive bitrate streaming (ABR) but it's a unicast stream, meaning every viewer is getting their own video stream from the internet. For live events or videos sent out to large portions of your organization, there could be a significant amount of internet bandwidth consumed by viewers. For organizations that want to reduce this internet traffic for live events, live events solutions are integrated with Microsoft's trusted video delivery partners offering software defined networks (SDNs) or enterprise content delivery networks (eCDNs). These SDN/eCDN platforms enable organizations to optimize network bandwidth without sacrificing end user viewing experiences. Our partners can help enable a more scalable and efficient video distribution across your enterprise network.

Purchase and set up your solution outside of Teams Get expert help with scaling video delivery by leveraging Microsoft's trusted video delivery partners. Before you can enable a video delivery provider to be used with Teams, you must purchase and set up the SDN/eCDN solution outside and separate from Teams.

The following SDN/eCDN solutions are pre-integrated and can be set up to be used with Stream.

- **Hive Streaming** provides a simple and powerful solution for live and on-demand enterprise video distribution. Hive is a software-based solution that requires no additional hardware or bandwidth and provides a secure way to enable thousands of simultaneous video viewers without impact to your network. For customers looking to understand the impact video is having on their network prior to purchasing an SDN/eCDN solution, Hive Streaming also provides a browser-based analytics solution for Microsoft customers. Learn more.

- **Kollective** is a cloud-based, smart peering distribution platform that leverages your existing network infrastructure to deliver content, in many forms, (live streaming video, on-demand video, software updates, security patches, etc.) faster, more reliably and with less bandwidth. Our secure platform is trusted by the world's largest financial institutions and with no additional hardware, setup and maintenance are easy. Learn more.

- **Ramp OmniCache** provides next-generation network distribution and ensures seamless delivery of video content across global WANs, helping event producers optimize network bandwidth and support successful live event broadcasts and on-demand streaming. The support for Ramp OmniCache for live events produced in Teams is coming soon. Learn more.
- **Riverbed**, the industry standard in network optimization, is extending its acceleration solutions to Microsoft Teams and Stream. Now Microsoft 365 customers can confidently accelerate 365 traffic including Teams and Stream along with a wealth of other leading enterprise SaaS services to increase workforce productivity from anywhere. Teams and Stream acceleration can be enabled through an effortless setup that comes with all the assurance of Riverbed's world-class support and ongoing investment.

> **NOTE**
>
> Your chosen SDN or eCDN solution is subject to the selected **3rd party provider's terms of service and privacy policy**, which will govern your use of the provider's solution. Your use of the provider's solution will not be subject to the Microsoft volume licensing terms or Online Services Terms. If you do not agree to the **3rd party provider's terms**, then don't enable the solution in Teams.

After you set up the SDN or eCDN solution, you're ready to configure the provider for live events in Teams.

Next steps

Go to Configure live events settings in Teams.

Related topics

- What is Teams live events?
- Plan for Teams live events
- Configure live events settings in Teams

Use PowerShell to set live events policies in Microsoft Teams

10/6/2020 • 2 minutes to read • Edit Online

You can use the following Windows PowerShell cmdlets to set and assign policy settings for live events in Teams:

- Get-CsTeamsMeetingBroadcastPolicy
- Set-CsTeamsMeetingBroadcastPolicy
- New-CsTeamsMeetingBroadcastPolicy
- Grant-CsTeamsMeetingBroadcastPolicy
- New-CsGroupPolicyAssignment

Here are some examples.

> **NOTE**
> Before you can run these cmdlets you must be connected to Skype for Business Online PowerShell. For more information, see Manage Skype for Business Online with Microsoft 365 or Office 365 PowerShell.

Allow users to schedule live events

> **NOTE**
> These examples are for events produced in Teams. For events produced with an external app or device, there are additional steps you must do. For more information, see Enable users to schedule events that were produced with an external app or device.

Allow a user to schedule live events

If the user is assigned the global policy, run and verify that *AllowBroadcastScheduling* parameter is set to *True*:

```
Get-CsTeamsMeetingBroadcastPolicy -identity Global
```

Then assign the user to the global policy, run:

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity {user} -PolicyName $null -Verbose
```

User scenarios

You want all users in your organization to be able to schedule live events

If users are assigned the global policy, run and verify that *AllowBroadcastScheduling* *is set to *True*:

```
Get-CsTeamsMeetingBroadcastPolicy -identity Global
```

If users are assigned a policy other than the global policy, run and verify that *-AllowBroadcastScheduling* is set to *True*:

```
Get-CsTeamsMeetingBroadcastPolicy -identity {policy name}
```

You want live events scheduling to be disabled across your organization

Disable live events scheduling, run:

```
Set-CsTeamsMeetingBroadcastPolicy -identity Global -AllowBroadcastScheduling $false
```

Assign all users in your organization to the global policy, run:

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity {user} -PolicyName $null -Verbose
```

You want a large number of users to be able to schedule live events and prevent a set of users from scheduling them

Run and verify that *AllowBroadcastScheduling* is set to *True*:

```
Get-CsTeamsMeetingBroadcastPolicy -Identity Global
```

Then assign a user or users to the global policy, run:

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity {user} -PolicyName $null -Verbose
```

Create a new policy that doesn't allow scheduling live events, run:

```
New-CSTeamsMeetingBroadcastPolicy -Identity DisabledBroadcastSchedulingPolicy
```

Disable live events scheduling, run:

```
Set-CsTeamsMeetingBroadcastPolicy -Identity DisabledBroadcastSchedulingPolicy -AllowBroadcastScheduling $false
```

Then assign users to this policy, run:

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity {user} -PolicyName DisabledBroadcastSchedulingPolicy -Verbose
```

You want to disable live event scheduling for a large number of the users and allow a set of users to schedule them

Disable live events scheduling, run:

```
Set-CsTeamsMeetingBroadcastPolicy -identity Global -AllowBroadcastScheduling $false
```

Then assign those users to the global policy, run:

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity {user} -PolicyName $null -Verbose
```

Create a policy to allow live events scheduling, run:

```
New-CSTeamsMeetingBroadcastPolicy -identity EnableBroadcastSchedulingpolicy
```

Enable live events scheduling, run:

```
Set-CsTeamsMeetingBroadcastPolicy -identity EnableBroadcastSchedulingpolicy -AllowBroadcastScheduling $true
```

Then assign users to this policy, run:

```
Grant-CsTeamsMeetingBroadcastPolicy -Identity {user} -PolicyName EnableBroadcastSchedulingpolicy -Verbose
```

Set who can join live events

Set the global policy to allow users to create events that everyone, including anonymous users, can attend, run:

```
Set-CsTeamsMeetingBroadcastPolicy -Identity Global -BroadcastAttendeeVisibility Everyone
```

Set the recording option for live events

> **NOTE**
> This setting applies only to events produced in Teams.

Set the global policy to disable recording for live events:

```
Set-CsTeamsMeetingBroadcastPolicy -Identity Global -BroadcastRecordingMode AlwaysDisabled
```

Set live captions and subtitles in live events

> **NOTE**
> This setting applies only to events produced in Teams.

Set the global policy to turn on live captions and subtitles (transcription) for event attendees:

```
Set-CsTeamsMeetingBroadcastPolicy -Identity Global -AllowBroadcastTranscription $true
```

Related topics

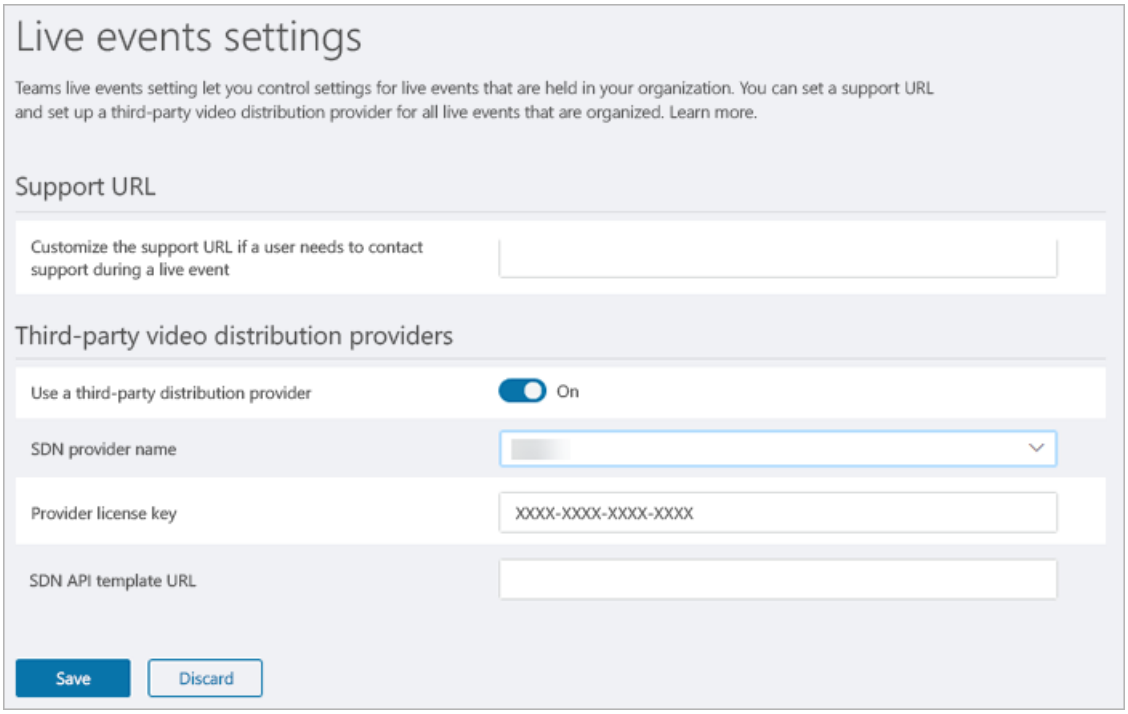
- Set up for Teams live events
- Teams PowerShell overview

Configure live event settings in Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

Use Teams live events settings to configure settings for live events that are held in your organization. You can set up a support URL and configure a third-party video distribution provider. These settings apply to all live events that are created in your organization.

You can easily manage these settings in the Microsoft Teams admin center. In the left navigation, go to **Meetings** > **Live events settings**.

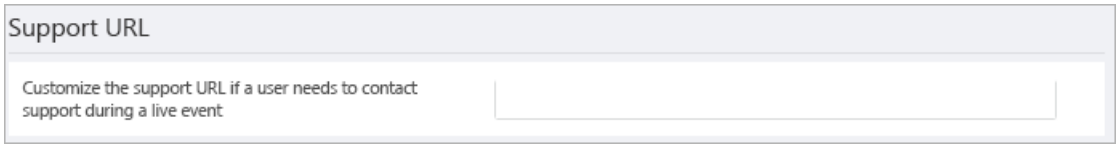


Set up event support URL

This URL is shown to live event attendees. Add the support URL for your organization to give attendees a way to contact support during a live event.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Live event settings**.
2. Under **Support URL**, enter your organization's support URL.



Using Windows PowerShell

Run the following:

```
Set-CsTeamsMeetingBroadcastConfiguration -SupportURL “{your URL}”
```

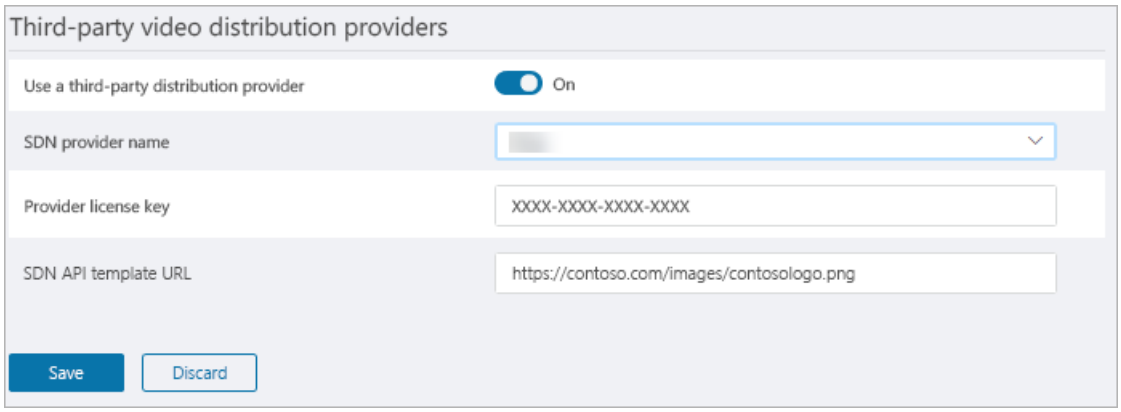
For more information, see Set-CsTeamsMeetingBroadcastConfiguration.

Configure a third-party video distribution provider

If you purchased and set up a software defined network (SDN) solution or enterprise content delivery network (eCDN) solution through a Microsoft video delivery partner, configure the provider for live events in Teams.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Meetings** > **Live event settings**.
2. Under **Third-party video distribution providers**, complete the following:



- **Use a third-party distribution provider** Turn this on to enable the third-party video distribution provider.
- **SDN provider name** Choose the provider you're using.
- **Provider license key** Enter the license ID that you got from your provider contact.
- **SDN API template URL** Enter the API template URL that you got from your provider contact.

Using Windows PowerShell

Get the license ID or API token and API template from your provider contact, and then run one of the following, depending on the provider you're using:

Hive

```
Set-CsTeamsMeetingBroadcastConfiguration -AllowSdnProviderForBroadcastMeeting $True -SdnProviderName hive -
SdnLicenseId {license ID GUID provided by Hive} -SdnApiTemplateUrl “{API template URL provided by Hive}”
```

Kollective

```
Set-CsTeamsMeetingBroadcastConfiguration -AllowSdnProviderForBroadcastMeeting $True -SdnProviderName
kollective -SdnApiTemplateUrl "{API template URL provided by Kollective}" -SdnApiToken {API token GUID
provided by Kollective}
```

Riverbed

```
Set-CsTeamsMeetingBroadcastConfiguration -AllowSdnProviderForBroadcastMeeting $True -SdnProviderName riverbed
-SdnApiTemplateUrl "{API template URL provided by Riverbed}" -SdnApiToken {API token GUID provided by
Riverbed}
```

For more information, see Set-CsTeamsMeetingBroadcastConfiguration.

> **NOTE**
>
> If you plan to create live events using an external app or device, you'll also need to configure your eCDN provider with Microsoft Stream.

> **NOTE**
>
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

Related topics

- What are Teams live events?
- Plan for Teams live events
- Set up for Teams live events

Plan your Teams voice solution

12/5/2020 • 13 minutes to read • Edit Online

This article helps you decide which Microsoft voice solution is right for your organization. After you've decided, the article provides a roadmap to content that will enable you to implement your chosen solution.

You might want the simplest solution—Phone System with Calling Plan. This is Microsoft's all-in-the-cloud solution that provides Private Branch Exchange (PBX) functionality and calls to the Public Switched Telephone Network (PSTN), as shown in the following diagram. With this solution, Microsoft is your PSTN carrier.



If you answer yes to the following, then Phone System with Calling Plan is the right solution for you:

- Calling Plan is available in your region.
- You do not need to retain your current PSTN carrier.
- You want to use Microsoft-managed access to the PSTN.

However, your situation might be more complex. For example, you might have offices in locations where Calling Plan isn't available. Or you might need a combination solution that supports a complex, multi-national deployment, with different requirements for different geographic locations. Microsoft supports a combination of solutions:

- Phone System with Calling Plan
- Phone System with your own PSTN carrier with Direct Routing
- A combination solution that uses both Phone System with Calling Plan and Phone System with Direct Routing

What do you need to read?

Required for all. Some of the sections in this article pertain to all organizations. For example, everyone should read about Phone System and understand the options for connecting to the Public Switched Telephone Network (PSTN).

REQUIRED FOR ALL	DESCRIPTION
Phone System	Microsoft's technology for enabling call control and Private Branch Exchange (PBX) capabilities in the Microsoft 365 cloud with Microsoft Teams.
Public Switched Telephone Network (PSTN) connectivity options	A choice between using Microsoft as your telephony carrier or connecting your own telephony carrier to Microsoft Teams by using Direct Routing. Combined with Phone System, PSTN connectivity options enable your users to make phone calls all over the world.

Depending on your requirements. Some of the sections in this article are pertinent depending on your existing deployment and requirements. For example, Location-Based Routing is only required for Direct Routing customers

in geographic locations that do not allow toll bypass.

DEPENDING ON YOUR REQUIREMENTS	DESCRIPTION
Phone numbers from Microsoft	How to get and manage phone numbers from Microsoft, and how to transfer existing numbers to Microsoft. Read this if you need to obtain phone numbers for Microsoft Calling Plan, transfer existing numbers, obtain service numbers, and so on.
Dial plans and call routing	How to configure and manage dial plans that translate dialed phone numbers into an alternate format (typically E.164 format) for call authorization and call routing. Read this if you need to understand what dial plans are and whether you need to specify dial plans for your organization.
Emergency calling	How to manage and configure emergency calling—depending on your PSTN connectivity option. Read this section if you are using Microsoft Calling Plan or Direct Routing and need to understand how to manage emergency calling for your organization.
Location-Based Routing for Direct Routing	How to use Location-Based Routing (LBR) to restrict toll bypass for Microsoft Teams users based on their geographic location. Read this section if your organization is using Direct Routing at a location that does not allow toll bypass.
Network topology for cloud voice features	If your organization is deploying Location-Based Routing (LBR) for Direct Routing or dynamic emergency calling, you must configure network settings for use with these features in Microsoft Teams. Read this section if you are implementing LBR for Direct Routing, or if you are implementing dynamic emergency calling with Calling Plan or Direct Routing.
Migrate your existing voice solution	What you need to think about when migrating your voice solution to Teams. Read this section if you are migrating from an existing voice solution to Teams.

IMPORTANT

This article focuses on voice solutions with Microsoft Teams. While solutions with Skype for Business Online are still available (as described in Microsoft telephony solutions), it's important to understand that Skype for Business Online will be retired on July 31, 2021. After that date, the Skype for Business Online service will no longer be accessible. In addition, PSTN connectivity between your on-premises environment—whether through Skype for Business Server or Cloud Connector Edition—and Skype for Business Online will no longer be supported. This article introduces Teams voice solutions and how you can connect your on-premises telephony network, if necessary, to Teams by using Direct Routing.

Phone System

Phone System is Microsoft's technology for enabling call control and Private Branch Exchange (PBX) capabilities in the Microsoft 365 or Office 365 cloud with Microsoft Teams.

Phone System works with Teams or Skype for Business clients and certified devices. Phone System allows you to replace your existing PBX system with a set of features directly delivered from Microsoft 365 or Office 365.

Calls between users in your organization are handled internally within Phone System, and never go to the Public Switched Telephone Network (PSTN). This applies to calls between users in your organization located in different geographical areas, removing long-distance costs on these internal calls.

This article introduces the following Phone System key features and functionality, and the deployment decisions you'll need to consider:

- Auto attendants and call queues
- Cloud Voicemail
- Calling identity

For information about all Phone System features, and how to set up Phone System, see the following articles:

- Here's what you get with Phone System
- Set up Phone System in your organization
  Describes how to buy and assign Phone System licenses, manage phone numbers, and set up communication credits for toll-free numbers.

For information about managing supported devices, see Manage your devices in Microsoft Teams and Teams Marketplace.

Auto attendants and Call queues

Auto attendants allow you to set up menu options to route calls based on caller input. Call queues are waiting areas for callers. Used together, auto attendants and call queues can easily route callers to the appropriate person or department in your organization.

For information about auto attendants and call queues, see the following articles:

- Plan for Teams auto attendants and call queues
- Set up an auto attendant
- Create a call queue
- Contoso case study: Auto attendants and call queues
  Describes how a fictional multi-national corporation, Contoso, implemented auto attendants and call queues for their voice solution.

Cloud Voicemail

Cloud Voicemail, powered by Azure Voicemail services, supports voicemail deposits to Exchange mailboxes only. It doesn't support third-party email systems.

Cloud Voicemail includes voicemail transcription, which is enabled for all users in your organization by default. Your business needs might require that you disable voicemail transcription for specific users or everyone throughout the organization.

For online only users, Cloud Voicemail is automatically set up and provisioned for users after they are assigned a Phone System license. For Phone System users with an Exchange mailbox, you will need to perform extra configuration steps.

For more information about Cloud Voicemail and its configuration, see the following articles:

- Set up Cloud Voicemail
- Set voicemail policies in your organization

Calling identity

By default, all outbound calls use the assigned phone number as calling identity (caller ID). The recipient of the call can quickly identify the caller and decide whether to accept or reject the call. For information about configuring caller ID or to change or block the caller ID, see Set the caller ID for a user.

Public Switched Telephone Network connectivity options

Phone System provides complete PBX capabilities for your organization. However, to enable users to make calls

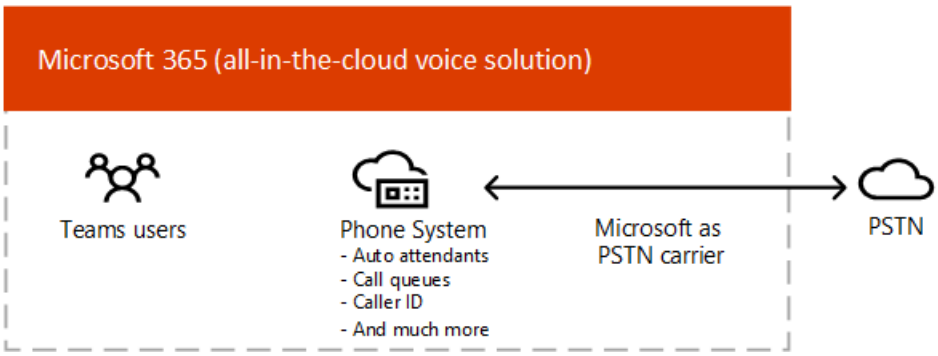
outside your organization, you need to connect Phone System to the Public Switched Telephone Network (PSTN). To connect Phone System to the PSTN, you can choose one of the following options:

- **Phone System with Calling Plan**. An all-in-the-cloud solution with Microsoft as your PSTN carrier.
- **Phone System with your own PSTN carrier** by using Direct Routing to connect your on-premises environment to Teams.

You can also choose a combination of options, which enables you to design a solution for a complex environment, or manage a multi-step migration (more about migration later).

Phone System with Calling Plan

As described earlier in this article, Phone System with Calling Plan is Microsoft's all-in-the-cloud voice solution for Teams users. This is the simplest option that connects Microsoft Phone System to the Public Switched Telephone Network (PSTN) to enable calls to landlines and mobile phones around the world. With this option, Microsoft provides Private Branch Exchange (PBX) functionality for your organization and acts as your PSTN carrier, as shown in the following diagram:



If you answer yes to the following, then Phone System with Calling Plan is the right solution for you:

- Calling Plan is available in your region.
- You do not need to retain your current PSTN carrier.
- You want to use Microsoft-managed access to the PSTN.

With this option:

- You get Microsoft Phone System with added Domestic or International Calling Plans that enable calling to phones around the world (depending on the level of service being licensed).
- You do not require deployment or maintenance of an on-premises deployment—because Calling Plan operates out of Microsoft 365 or Office 365.
- Note: If necessary, you can choose to connect a supported Session Border Controller (SBC) through Direct Routing for interoperability with third-party PBXs, analog devices, and other third-party telephony equipment supported by the SBC.

This option requires uninterrupted connection to Microsoft 365 or Office 365.

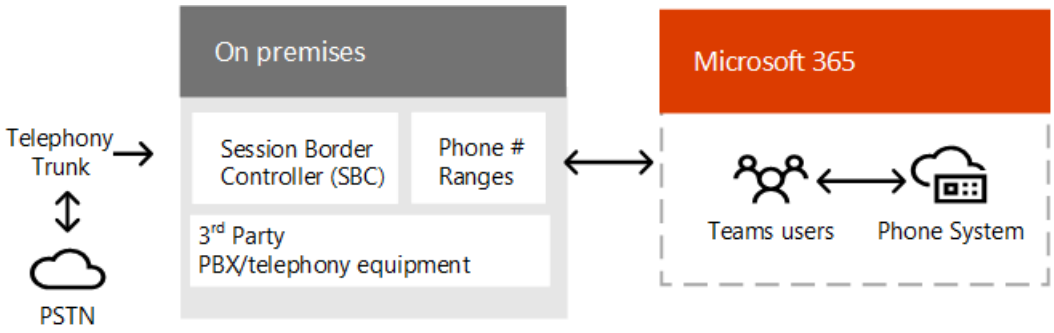
For more information about Calling Plan, see the following articles:

- Which Calling Plan is right for you?
- How to buy a Calling Plan
- Country and region availability for Calling Plan
- Set up Calling Plan

Phone System with own PSTN carrier with Direct Routing

This option connects Microsoft Phone System to your telephony network by using Direct Routing, as shown in the

following diagram:



If you answer yes to the following questions, then Phone System with Direct Routing is the right solution for you:

- You want to use Teams with Phone System.
- You need to retain your current PSTN carrier.
- You want to mix routing, with some calls going through Calling Plan, some through your carrier.
- You need to interoperate with third-party PBXs and/or equipment such us overhead pagers, analog devices, and so on.

With this option:

- You connect your own supported SBC to Microsoft Phone System without the need for additional on-premises software.
- You can use virtually any telephony carrier with Microsoft Phone System.
- You can choose to configure and manage this option, or it can be configured and managed by your carrier or partner (ask if your carrier or partner provides this option).
- You can configure interoperability between your telephony equipment—such as a third-party PBX and analog devices—and Microsoft Phone System.

This option requires the following:

- Uninterrupted connection to Microsoft 365 or Office 365.
- Deploying and maintaining a supported SBC.
- A contract with a third-party carrier. (Unless deployed as an option to provide connection to third-party PBX, analog devices, or other telephony equipment for users who are on Phone System with Calling Plan.)

For more information about Direct Routing, see the following articles:

- Phone System Direct Routing
- Plan Direct Routing
- Configure Direct Routing
- Manage voice routing policies for use with Direct Routing
- Plan Location-Based Routing for Direct Routing
- List of Session Border Controllers certified for Direct Routing

Phone numbers from Microsoft

Microsoft has two types of telephone numbers available: *subscriber* (user) numbers, which can be assigned to users in your organization, and *service* numbers, available as toll and toll-free service numbers. Service numbers have higher concurrent call capacity than subscriber numbers and can be assigned to services such as Audio Conferencing, Auto Attendants, or Call Queues.

You will need to decide:

- Which user locations need new phone numbers from Microsoft?
- Which type of telephone number (subscriber or service) do I need?
- How do I port existing phone numbers to Teams?

For more information about managing phone numbers in your organization, including getting new numbers or transferring exiting numbers, see the following articles:

- Manage phone numbers for your organization
- Different kinds of phone numbers used for Calling Plan
- Getting phone numbers for your users
- Transfer phone numbers to Microsoft Teams

Dial plans and call routing

A dial plan is a set of normalization rules that translate dialed phone numbers into an alternate format (typically E.164 format) for call authorization and call routing.

You will need to decide the following:

- Does my organization need a customized dial plan?
- Which users require a customized dial plan?
- Which tenant dial plan should be assigned to each user?

For more information, see the following articles:

- What are dial plans?
- Plan for tenant dial plans
- Create and manage dial plans

Emergency calling

How you configure emergency calling differs depending on your PSTN connectivity option: Microsoft Calling Plan or Direct Routing. Dynamic emergency calling for Microsoft Calling Plan and Phone System Direct Routing provides the capability to configure and route emergency calls and notify security personnel based on the current location of the Teams client. For more information about emergency calling concepts and terminology, and how to configure dynamic emergency calling, see the following articles:

- Manage emergency calling
- Plan and configure dynamic emergency calling
- Contoso case study: Emergency calling
  Describes how a fictional multi-national corporation, Contoso, implemented emergency calling for their organization.

Location-Based Routing for Direct Routing

In some countries and regions, it's illegal to bypass the Public Switched Telephone Network (PSTN) provider to decrease long-distance calling costs. Location-Based Routing for Direct Routing enables you to restrict toll bypass for Microsoft Teams users based on their geographic location. For more information about how to plan and configure Location-Based Routing (LBR), see the following articles:

- Plan Location-Based Routing for Direct Routing
- Configure network settings for Location-Based Routing
- Enable Location-Based Routing for Direct Routing

- Contoso case study: Location-Based Routing
  Describes how a fictional multi-national corporation, Contoso, implemented Location-Based Routing for their organization.

Network topology for voice features

If you are deploying dynamic emergency calling or Location-Based Routing for Direct Routing, you must configure network settings for use with these features in Microsoft Teams. To learn how to configure network settings for network regions, network sites, network subnets, and trusted IP addresses, see the following articles:

- Network settings for cloud voice features in Microsoft Teams - Concepts and terminology
- Manage your network topology for cloud voice features in Microsoft Teams

Migrate your existing voice solution to Teams

For an organization that is upgrading to Teams, the ultimate goal is to move all users to TeamsOnly mode. Using Phone System with Teams is only supported when the user is in TeamsOnly mode. If you need basic information about upgrading to Teams, start here:

- Getting started with your Microsoft Teams upgrade
- About the upgrade framework
- Upgrade from Skype for Business to Teams — for IT administrators

When migrating your voice solution, there are four possible calling scenarios when moving to TeamsOnly mode:

- **A user in Skype for Business Online, with a Microsoft Calling Plan**. Upon upgrade, this user will continue to have a Microsoft Calling Plan.
- **A user in Skype for Business Online, with on-premises voice functionality through Skype for Business on-premises or Cloud Connector Edition**. The user's upgrade to Teams needs to be coordinated with migration of the user to Direct Routing to ensure the TeamsOnly user has PSTN functionality.
- **A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and keeping on-premises PSTN connectivity**. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with migration of the user to Direct Routing.
- **A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and using a Microsoft Calling plan**. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with either A) the port of that user's phone number to a Microsoft Calling Plan or B) assigning a new subscriber number from available regions.

For more information about how to implement your voice migration for each of these scenarios—including information about when you need to set up hybrid connectivity and how to migrate users with on-premises voice functionality to Direct Routing—see the following articles:

- PSTN considerations when upgrading to Teams — for IT administrators
- Contoso voice migration case study
  The case study describes how a fictional multi-national corporation, Contoso, implemented a Teams voice solution for their organization. It contains the following articles:
  - Teams upgrade plan
  - Phone System and PSTN connectivity options

- Location-Based Routing implementation
- Emergency calling
- Auto attendants and call queues
- Audio Conferencing

What is Phone System?

12/5/2020 • 3 minutes to read • Edit Online

A Private Branch Exchange (PBX) is a phone system within a business. Phone System gives you PBX capabilities, but without the complicated and expensive equipment.

Phone System allows you to replace your existing on-premises PBX system with a set of features delivered from Microsoft 365 or Office 365 that is tightly integrated into your cloud experience. For more information about the features, see Here's what you get with Phone System.

Phone System technology

Phone System enables call control and PBX capabilities in the cloud with Microsoft Teams and Skype for Business Online.

With Phone System, users can use Teams or Skype for Business Online to place and receive calls, transfer calls, and mute or unmute calls. Phone System users can click a name in their address book, and place Teams or Skype for Business Online calls to that person. To place and receive calls, Phone System users can use their mobile devices, a headset with a laptop or PC, or one of many IP phones that work with Teams and Skype for Business Online. Phone System administrators can manage calling options and settings from the same console used for messaging, collaboration, and so on.

Calls between users in your organization are handled internally within Phone System, and never go to the Public Switched Telephone Network (PSTN). This applies to calls between users in your organization located in different geographical areas, removing long-distance costs on these internal calls.

For calls outside your organization, Microsoft provides multiple options for connecting Phone System to the Public Switched Telephone Network (PSTN).

Connect to the Public Switched Telephone Network (PSTN)

Phone System can be connected to the PSTN in one of two ways:

- Purchase a Microsoft Calling Plan (domestic or domestic and international). Microsoft Calling Plan is an all-in-the-cloud solution with Microsoft as your PSTN carrier. For more information, see Phone System and Calling Plans.
- Use your existing telephony infrastructure for on-premises PSTN connectivity.

  For your Teams users, you can connect your on-premises telephony infrastructure to Phone System by using Direct Routing. For more information, see Phone System Direct Routing.

  For more information about all Microsoft telephony solutions, see Microsoft telephony solutions.

Phone System with services

Phone System can be used for services and voicemail, such as:

- **Auto attendants** - Auto attendants can be used to create a menu system for your organization that lets external and internal callers move through the system to locate and place or transfer calls to company users or departments in your organization. See What are Cloud auto attendants?.
- **Call queues** - Call queue greetings can be used when someone calls in to a phone number for your

organization. These greetings include the ability to automatically put the calls on hold and the ability to search for the next available call agent to handle the call while the people who call are listening to music on hold. You can create single or multiple call queues for your organization. See Create a Cloud call queue.

- **Voicemail** - When you get a Phone System license for a user, that user is able to get voicemail that has been left by callers. Cloud Voicemail is automatically set up and provisioned for users after you assign a Phone System license and a phone number to them. See Set up Cloud Voicemail.

For more information about features, see Here's what you get with Phone System. If you're ready to get started, see Set up Phone System in your organization.

Related topics

- Phone System features
- Cloud voice in Microsoft Teams
- Set up Phone System
- Which Calling Plan is right for you?
- Phone System Direct Routing
- Microsoft Teams add-on licensing

Here's what you get with Phone System

12/5/2020 • 6 minutes to read • Edit Online

This article describes Phone System features. For more information about using Phone System as your Private Branch Exchange (PBX) replacement, and options for connecting to the Public Switched Telephone Network (PSTN), see What is Phone System.

Clients are available for PC, Mac, and mobile, which provides features on devices from tablets and mobile phones to PCs and desktop IP phones. For more information, see Get clients for Microsoft Teams.

> **NOTE**
> For details about Teams phone systems on different platforms, see Teams features by platform.

Phone System features

Phone System provides the following features. Unless otherwise noted, features are available in both Teams and Skype for Business Online.

Phone System feature	Description
Cloud auto attendants	Lets you create a menu system that enables external and internal callers to locate and place or transfer calls to company users or departments in your organization.
Cloud call queues	Lets you configure how call queues are managed for your organization: for example, set up greetings and music on hold, search for the next available call agent to handle the call, and so on.
Music on hold	Plays default music defined by the service when an external call from the Public Switched Telephone Network (PSTN) is placed on hold. This feature works for one-to-one PSTN-to-Teams calls in addition to calls made to a call queue. This feature provides on-hold notification parity with other platforms. This feature is configurable by the administrator but currently only via PowerShell. Hold music is also not supported in consultative transfer of a PSTN call.
Call answer/initiate (by name and number)	Lets users answer inbound calls with a touch, and place outbound calls either by dialing the full phone number or by clicking a name in the client.
Call forwarding options and simultaneous ring	Lets users set up forwarding rules so calls can go with them anywhere, or calls can be forwarded to colleagues or to voicemail.

Group call pickup and forward to group	Lets users share incoming calls with colleagues so that the colleagues can answer calls that occur while the user is unavailable. Less disruptive to recipients than other forms of call sharing (such as call forwarding or simultaneous ringing) because users can configure how they want to be notified of an incoming shared call.
Transfer a call and consultative transfer	Lets users transfers calls to another person. Or, if they need to leave their office but want to continue the conversation, they can transfer the calls from their PC or IP phone to their cell phone.
Transfer to voicemail mid call	Lets users transfer to voicemail during a call.
Call park and retrieve	Lets users place a call on hold in the Teams service in the cloud. When a call is parked, the service generates a unique code for call retrieval. The user who parked the call or someone else can then use that code and a supported app or device to retrieve the call.
Call phone number from search	Lets users place a call from the search box by using the /call command and specifying a name or a number.
Caller ID	Calls from inside the company display a detailed caller ID that pulls information from the corporate directory, showing picture ID and job title instead of just a phone number. For calls from external phone numbers, the caller ID as provided by the phone service provider is displayed. If the external phone numbers are secondary numbers in the corporate directory, then the information from the corporate directory will be displayed.
Device switching	Lets users play a call or meeting on another HID device that is connected to Teams; for example, switching from their PC speakers to a headset.
Presence-based call routing	Controls inbound communications with presence, enabling the user to block all incoming communication except from those specifically indicated.
Integrated dial pad	Lets users dial by name or by number anywhere in the search bar and in the dial pad, speeding up the process of making outbound calls.
Federated calling	Lets users securely connect, communicate, and collaborate with users in federated tenants.
Make and receive a video call	If the user's account is enabled for video calls, the user can make face-to-face video calls with their contacts. All they need is a camera, their computer's speakers and microphone. Users can also use a headset if their computer doesn't have a built-in audio device.

Cloud voicemail	When a user receives a voicemail, it is delivered to their Exchange mailbox as an email with the voicemail message as an attachment. Users can listen to their messages on their certified desktop phone, and on all Teams or Skype for Business applications. Support for voicemail transcription has been added as of March 2017 and is enabled by default for all organizations and users.
Cloud voicemail user settings	Lets users configure their client settings for voicemail greetings, call answering rules, and greeting language, including out-of-office greetings.
Secondary ringer	Users with multiple speaker devices connected to their PC can choose to set a secondary device to ring in addition to their default speaker. For example, a user with a headset connected to the PC and desk speakers can choose to have both headset and desk speakers ring when a call comes in so that they don't miss a call.
Distinctive ring alerts (Teams only)	Lets users choose separate ringtones for normal calls, forwarded calls, and delegated calls so they can distinguish the type of call.
Shared Line Appearance	Lets users share their phone line so that another user can make and receive calls on their behalf.
Busy on Busy (Teams only)	A calling policy that lets you configure how incoming calls are handled when a user is already in a call or conference or has a call placed on hold. The caller will hear a busy signal when the callee is on the phone already. The callee gets a missed call notification but is not able to answer incoming calls. This is feature is disabled by default but can be turned on by the tenant admin.
Call blocking	Lets users add (PSTN) phone numbers to a blocked list so that the next call from that number is blocked from ringing the user.
Common Area Phones	A common area phone is typically placed in an area like a lobby or conference room making it available to multiple people. Common area phones are set up as devices rather than users, and can automatically sign into a network.
Media bypass support (for Teams Direct Routing only)	For better performance, media is kept between the Session Border Controller (SBC) and the client instead of sending it via the Microsoft Phone System.

Availability in GCC High and DoD clouds

The following capabilities are not yet available in GCC High and DoD Clouds.

- Call settings for secondary ringer, voicemail, and enhanced delegation
- Transfer to voicemail mid call
- Call phone number from search bar
- Music on hold
- Azure AD reverse number lookup

Related topics

- What is Phone System
- Cloud voice in Microsoft Teams
- Set up Phone System
- Which Calling Plan is right for you?
- Phone System Direct Routing
- Monitor and manage call quality
- Microsoft Teams add-on licensing
- Pricing for Phone System
- Teams for Virtualized Desktop Infrastructure with callings and meetings

Set up Phone System in your organization

12/5/2020 • 7 minutes to read • Edit Online

The following is a step-by-step guide for setting up Phone System in Microsoft 365 or Office 365. Links to additional, detailed information are available at the end of each step.

Step 1: Make sure that Phone System is available in your country or region

1. First go to Country and region availability for Audio Conferencing and Calling Plans, and select your country or region from the list at the top of the page.
2. Under **Phone System**, review the list of features and details.
3. If Phone System is available, go to step 2.

Step 2: Buy and assign Phone System and Calling Plan licenses

To assign a Phone System and Calling Plan license to a single user, the steps are the same as assigning a Microsoft 365 or Office 365 license. You can also assign licenses to multiple users in bulk. For more information, see Assign Microsoft Teams add-on licenses.

If Calling Plans are not available for your country or region, consider using Direct Routing to connect your on-premises telephony infrastructure to Phone System. For more information, see Phone System Direct Routing.

Step 3: Get phone numbers for your users

Before you can set up users in your organization to make and receive phone calls, you must get phone numbers for them.

You have three ways of getting numbers for your users:

- Get new numbers using the Teams admin center.
- Get new numbers that aren't available in the Teams admin center.
- Port or transfer your existing numbers from your current service provider or phone carrier to Microsoft 365 or Office 365.

You must use the **Add numbers** page to see, search, acquire, and reserve those numbers. You can search by Country/Region, State, and City, and then enter the number of phone numbers you will need for your users.

Get new user phone numbers using the Teams admin center

1. Sign in to Microsoft 365 with your work or school account.
2. Go to the **Teams admin center**.
3. In the left navigation go to **Voice** > **Phone numbers**, click **Add**, and then follow the prompts.

Get new numbers that aren't available in the Teams admin center

Sometimes (depending on your country/region) you won't be able to get your new numbers using the Teams admin center. In this case, you'll need to download a form and send it back to us. To learn how to request new user numbers, see Manage phone numbers for your organization.

Port or transfer phone numbers from your service provider or phone carrier

- If you need 999 or fewer phone numbers for your users, you can use the **New Local Number Port Order** wizard in the Teams admin center. Follow the steps found in Transfer phone numbers to Teams to transfer your phone numbers.
- If you need to port more than 999 phone numbers, see Manage phone numbers for your organization to submit a port order service request or order.

For detailed information about getting new phone numbers or transferring existing numbers, see Manage phone numbers for your organization.

Step 4: Get service phone numbers (audio conferencing, call queues, auto attendants)

In addition to getting phone numbers for your users from Microsoft 365 or Office 365, you can search and acquire toll or toll-free phone numbers for services such as audio conferencing (for conference bridges), auto attendants, and call queues. Service phone numbers have a higher concurrent calling capacity than user or subscriber phone numbers. For example, a service number can handle hundreds of calls simultaneously, whereas a user's phone number can only handle a few calls simultaneously.

Get new service numbers using the Teams admin center

1. Sign in with your work or school account.
2. Go to the **Teams admin center**.
3. In the left navigation pane go to **Voice** > **Phone numbers** > **Add new number**, and then click **New service numbers**.

> **IMPORTANT**
> For you to see the **Voice** option in the left navigation pane in the Teams admin center, you must first buy at least one **Enterprise E5 license**, one **Phone System** add-on license, or one **Audio Conferencing** add-on license.

Get new numbers that aren't available in the Teams admin center

Sometimes (depending on your country/region) you won't be able to get your new numbers using the Teams admin center. In this case, you will need to download a form and send it back to us. To learn how to request new numbers, see Manage phone numbers for your organization.

Port or transfer existing service numbers

If you want to transfer service numbers from your current service provider or carrier, you need to manually submit a port order to Microsoft. You need to submit separate port orders for each type of service number (toll vs. toll-free) that you will be transferring using a Letter of Authorization (LOA). In the Letter of Authorization (LOA), you must select the correct type of service number. When contacting Microsoft support, specify that you are transferring a service number (*and not a user or subscriber number*), or the concurrent calling capacity may not be enough to handle call volumes. If you want to transfer phone numbers or do other things with your phone numbers, see Manage phone numbers for your organization.

Step 5: If you want to set up Calling Plans

If you have been following the steps above, you have already bought and assigned Phone System and licenses and a Calling Plan (step 2) and acquired phone numbers for your users (step 3), so your calling plan is partially set up. To complete the procedures for setting up Calling Plan, see Set up Calling Plans.

Step 6: If you want to set up Audio Conferencing

Sometimes people in your organization will need to use a phone to call in to a meeting. Microsoft Teams includes the Audio Conferencing feature for just this situation. People can call in to Teams meetings using a phone, instead of using the Teams app on a mobile device or PC. For information about how to set up Audio Conferencing, see Set up Audio Conferencing for Teams.

Step 7: If you want to set up a Cloud call queue

Cloud call queues include greetings that are used when someone calls in to a phone number for your organization, the ability to automatically put the calls on hold, and the ability to search for the next available call agent to handle the call while the people who call are listening to music on hold. You can create single or multiple call queues for your organization.

For more information about call queues, see Create a Cloud call queue.

Step 8: If you want to set up a Cloud auto attendant

Auto attendants let people that call in to your organization and navigate a menu system to get them to the right department, call queue, person, or the operator. You can create an auto attendant for your organization by using the Teams admin center.

For information about setting up a Cloud auto attendendant, see Set up a Cloud auto attendant.

Step 9: Assign service phone numbers (audio conferencing, call queues, auto attendants)

Once you have your service numbers from **Step 4 above**, you need to assign them to each type of service that you want. For example, if you want a dedicated service phone number (toll or toll-free), you'll need to assign the number to the conferencing bridge.

- For Audio Conferencing, you can assign a dedicated number to a conferencing bridge by going to **Teams admin center** > **Meetings** > **Conference bridges** and follow the prompts. For more information, see Change the toll or toll-free numbers on your Audio Conferencing bridge.
- For Auto Attendants, you can assign a dedicated number to an auto attendant by going to **Teams admin center** > **Voice** > **Auto attendants** and follow the prompts. For more information, see Set up a Cloud auto attendant.
- For Call Queues, you can assign a dedicated number to a call queue by going to **Teams admin center** > **Voice** > **Call queues** and follow the prompts. For more information, see Create a Cloud call queue.

For detailed information about getting new service numbers and porting existing service numbers, see Getting service phone numbers.

Step 10: Set up Communications Credits for your organization

If you would like to use toll-free numbers with Microsoft Teams, You'll need to set up Communications Credits. Microsoft recommends that you set up Communications Credits for your Calling Plans (Domestic or International) and Audio Conferencing users who need the ability to dial out to any destination. Many countries/regions are included, but some destinations may not be included in your Calling Plan or Audio Conferencing subscriptions.

If you don't set up Communications Credits billing and assign a **Communications Credits** license to your users and you run out minutes for your organization (depending on your Calling Plan or Audio Conferencing plan in your country/region), those users won't be able to make calls or dial out from Audio Conferencing meetings. For more information, including recommended funding amounts, see What are Communications Credits? and Set up Communications Credits for your organization.

Related topics

Here's what you get with Phone System in Microsoft 365 or Office 365

Manage phone numbers for your organization

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Set up the Common Area Phone license for Microsoft Teams

10/15/2020 • 3 minutes to read • Edit Online

NOTE

Common area phones do not support voicemail.

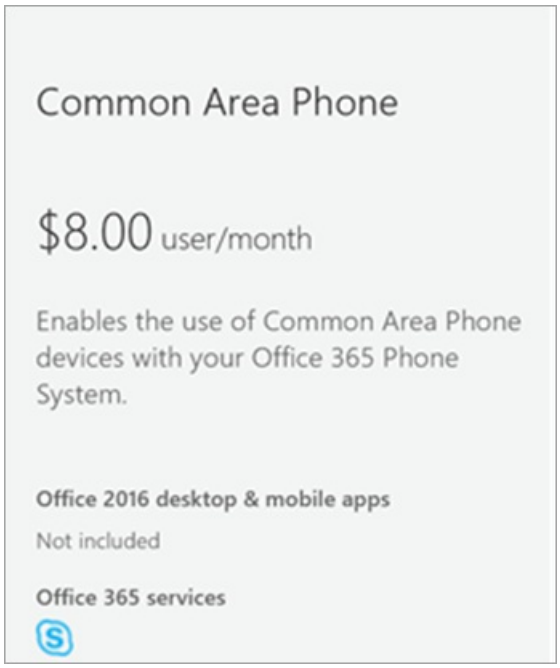
A common area phone is typically placed in an area like a lobby or another area that is available to many people to make a call; for example, a reception area, lobby, or conference phone. Common area phones are signed in with accounts tied to a Common Area Phone license. The TeamsIPPhone policy must also be appropriately set for the phone to have a common area user experience.

In the steps below, we'll help you set up an account for Phone System to deploy common area phones for your organization. For a more complete meeting room experience, including audio conferencing, consider purchasing the dedicated Meeting Room license with a meeting room device.

First, you need to purchase a Common Area Phone (CAP) license and make sure that you have a certified phone. To search for and learn more about certified phones, go to Microsoft Teams devices.

Step 1 - Buy the licenses

1. In the Microsoft 365 admin center, go to **Billing** > **Purchase services** and then expand **Other plans**.



2. Select **Common Area Phone** > **Buy now**.
3. On the Checkout page, click **Buy now**.
4. Expand **Add-on subscriptions** and then click to buy a Calling Plan. Choose either the **Domestic Calling Plan** or **Domestic and International Calling Plan**.

NOTE

If you are using Microsoft Phone System Direct Routing, you do not need a Calling Plan license.

NOTE

You don't need to add a Phone System license. It's included with the Common Area Phone license.

For more information on licenses, see Microsoft Teams add-on licensing.

The Common Area Phone license supports:

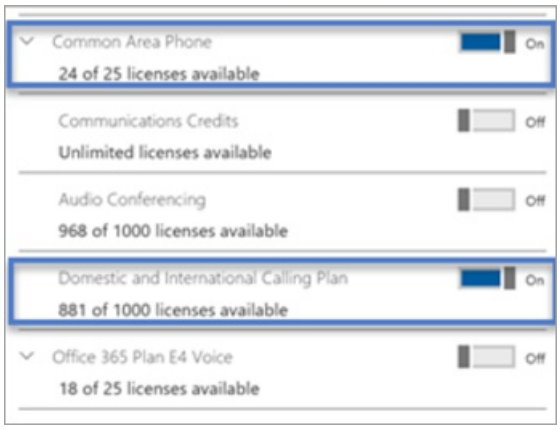
	COMMON AREA PHONE
Skype for Business	✔
Microsoft Teams	✔
Phone System	✔
Audio Conferencing	✗ [1]
Microsoft Intune	✗
Worldwide Availability	✗ [2]
Channel Availability	EA, EAS, CSP, GCC, EES, Web Direct

[1] Common Area Phones can join audio conferences via dial-in number provided by the meeting organizer

[2] Not available in sovereign clouds

Step 2 - Create a new user account for the phone and assign the licenses

1. In the Microsoft 365 admin center, go to **users** > **active users** > **add a user**.
2. Enter a user name like "Main" for the first name and "Reception" for the second name.
3. Enter a display name if it doesn't autogenerate one like "Main Reception."
4. Enter a user name like "MainReception" or "Mainlobby."
5. For common area phones, you might want to set a password manually or have the same password for all your common area phones. Also, you might think about clearing the **Make this user change their password when they first sign in** check box.
6. Assign the licenses to the user. On the same page, click to expand **Product licenses**. Turn on the Common Area Phone and pick either a **Domestic Calling Plan** or a **Domestic and International Calling Plan**.



NOTE

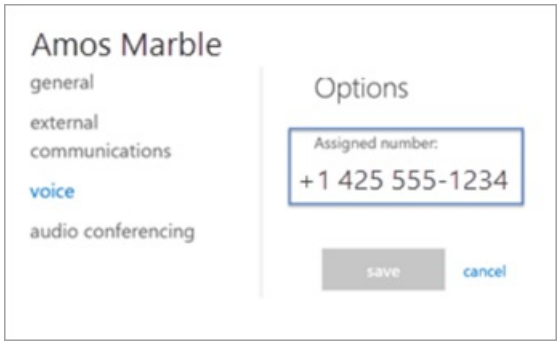
If you are using Microsoft Phone System Direct Routing, you do not need to assign a Calling Plan license.

For more information, see Assign licenses to users.

Step 3 - Assign a phone number to the Common Area Phone user account

Use the Teams admin center to assign a number to the user.

1. In the Teams admin center, select **Voice** > **Phone numbers**.
2. Select a number from the list of phone numbers and click **Assign**.
3. On the **Assign** page, in the Voice user box, type the name of the user who will be using the phone, and then select the user in the **Select a voice user** drop-down list.
4. Next, you need to add an emergency address. Choose **Search by city**, **Search by description**, or **Search by location** from the drop-down list, and then enter the city, description, or location in the text box. Once you search, look under **Select emergency address** to pick the right one for you.
5. Click **Save** and your user should look like this:



NOTE

Users will only show up if they have a Phone System license applied. If you just did this, then sometimes it takes a bit for the user to show up in the list.

For more information, see Getting phone numbers for your users.

You can also take your phone number that you have with another carrier and "port" or transfer it over to Microsoft 365 or Office 365. See Transfer phone numbers to Teams.

Set up Cloud Voicemail

12/5/2020 • 5 minutes to read • Edit Online

This article is for the Microsoft 365 or Office 365 admin as described in About admin roles who wants to set up the Cloud Voicemail feature for everyone in the business.

> **NOTE**
> Cloud Voicemail supports depositing voicemail messages only in an Exchange mailbox and doesn't support any third-party email systems.

> **NOTE**
> When a delegate answers a call on behalf of a delegator, notifications are not available in Cloud Voicemail. Users can receive notifications for missed calls.

Cloud-only environments: Set up Cloud Voicemail for Online Phone System users

For Online Phone System users, Cloud Voicemail is automatically set up and provisioned for users after you assign a **Phone System** license to the users.

> **NOTE**
> For Online Skype for Business Phone System users with on-premises provided phone numbers, you may need to enable hosted voice mail with Set-CsUser -HostedVoicemail $True.

Set up Cloud Voicemail for Exchange Server Mailbox Users

The following information is about configuring Cloud Voicemail to work with users who are online for Phone System but have their mailbox on Exchange Server.

1. Voicemail messages are delivered to users' Exchange mailbox via SMTP routed through Exchange Online Protection. To enable successful delivery of these messages, please be sure that Exchange Connectors are configured correctly between your Exchange servers and Exchange Online Protection; Use Connectors to Configure Mail Flow.

2. To enable Voicemail features such as customizing greetings and visual voicemail in Skype for Business clients, connectivity from Microsoft 365 or Office 365 to the Exchange server mailbox via Exchange Web Services is required. To enable this connectivity, you must configure the new Exchange Oauth authentication protocol described in Configure OAuth authentication between Exchange and Exchange Online organizations, or run the Exchange Hybrid Wizard from Exchange 2013 CU5 or greater. Additionally, you must configure integration and Oauth between Skype for Business Online and Exchange server described in Configure Integration and OAuth between Skype for Business Online and Exchange Server.

Set up Cloud Voicemail for Skype for Business Server Users

To configure Skype for Business server users for Cloud Voicemail, please see Plan Cloud Voicemail service for on-

premises users.

Enabling protected voicemail in your organization

When someone leaves a voicemail message for a user in your organization, the voicemail is delivered to the user's mailbox as an email message attachment. Using mail flow rules to apply message encryption, you can prevent those voicemail messages from being forwarded to other recipients. When you enable protected voicemail, users can listen to protected voicemail messages by calling into their voicemail mailbox or by opening the message in Outlook, Outlook on the web, or in Outlook for Android or iOS. Protected voicemail messages can't be opened in Skype for Business.

For more information about message encryption, see Email encryption.

To set up protected voicemail, do the following:

1. Go to https://admin.microsoft.com and sign in using an account with global administrator permissions.
2. Select **Show all** and then go to **Admin centers** > **Exchange**.
3. In the Exchange Admin Center, select **Mail flow** > **Rules**.
4. Select **+ Add**, and then select **Apply Office 365 Message Encryption and rights protection to messages**.
5. Provide a name for the new mail flow rule and then under **Apply this rule if**, select **The message properties** > **Include the message type** > **Voice mail**. Select **OK**.
6. Under **Do the following**, select **Apply Office 365 Message Encryption and rights protection to the message with** and then select **Select one**. Under **RMS template**, select **Do not forward**. Select **OK** and then **Save**.

   > **NOTE**
   >
   > If the **RMS template** list is empty, you need to set up Message Encryption. For more information about setting up Message Encryption, see the following articles:
   >
   > - Set up new Message Encryption capabilities
   > - Configuring and managing templates for Azure Information Protection
   > - Do Not Forward option for emails

Setting voicemail policies in your organization

> **WARNING**
>
> For Skype for Business customers, disabling voicemail through a Microsoft Teams calling policy might also disable the voicemail service for your Skype for Business users.

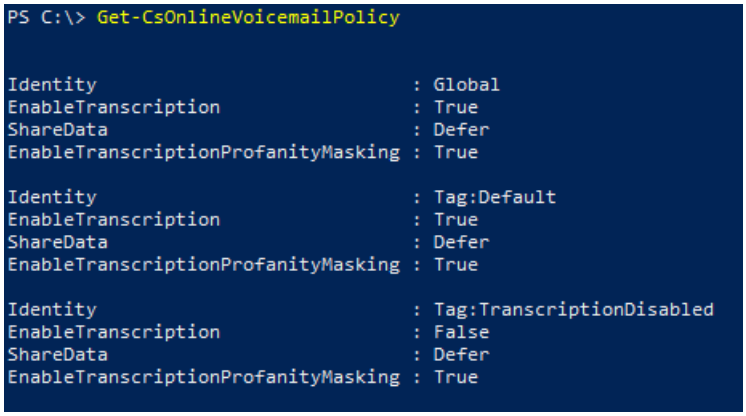
Voicemail transcription is enabled by default and transcription profanity masking is disabled by default for all organizations and users; however, you can control them by using the Set-CsOnlineVoicemailPolicy and Grant-CsOnlineVoicemailPolicy cmdlets.

Voicemail messages received by users in your organization are transcribed in the region where your Microsoft 365 or Office 365 organization is hosted. The region where your tenant is hosted might not be the same region where the user receiving the voicemail message is located. To view the region where your tenant is hosted, go to the Organization profile page and then click **View details** next to **Data location**.

> **IMPORTANT**
>
> You can't create a new policy instance for transcription and transcription profanity masking using the **New-CsOnlineVoiceMailPolicy** cmdlet, and you can't remove an existing policy instance using the **Remove-CsOnlineVoiceMailPolicy** cmdlet.

You can manage the transcription settings for your users using voicemail policies. To see all available voicemail policy instances, you can use the Get-CsOnlineVoicemailPolicy cmdlet.

```
PS C:\> Get-CsOnlineVoicemailPolicy
```



Turning off transcription for your organization

Because the default setting for transcription is on for your organization, you may want to disable it by using Set-CsOnlineVoicemailPolicy. To do this, run:

```
Set-CsOnlineVoicemailPolicy -EnableTranscription $false
```

Turning on transcription profanity masking for your organization

Transcription profanity masking is disabled by default for your organization. If there is a business requirement to enable it, you can enable transcription profanity masking by using Set-CsOnlineVoicemailPolicy. To do this, run:

```
Set-CsOnlineVoicemailPolicy -EnableTranscriptionProfanityMasking $true
```

Turning off transcription for a user

User policies are evaluated before the organizational default settings. For example, if voicemail transcription is enabled for all of your users, you can assign a policy to disable transcription for a specific user by using the Grant-CsOnlineVoicemailPolicy cmdlet.

To disable transcription for a single user, run:

```
Grant-CsOnlineVoicemailPolicy -PolicyName TranscriptionDisabled -Identity sip:amosmar@contoso.com
```

Turning on transcription profanity masking for a user

To enable transcription profanity masking for a specific user, you can assign a policy to enable transcription profanity masking for a specific user by using the Grant-CsOnlineVoicemailPolicy cmdlet.

To enable transcription profanity masking for a single user, run:

```
Grant-CsOnlineVoicemailPolicy -PolicyName TranscriptionProfanityMaskingEnabled -Identity
sip:amosmar@contoso.com
```

IMPORTANT

The voicemail service in Microsoft 365 and Office 365 caches voicemail policies and updates the cache every 4 hours. So, policy changes that you make can take up to 4 hours to be applied.

Help your users learn Teams voicemail features

We have the following information for your users on managing their voicemail settings as well as other calling features in Teams:

- Manage your call settings in Teams. This article explains how to manage all end-user Teams calling features.

Help your users learn Skype for Business voicemail features

We have training information and articles to help your users be successful with Skype for Business voicemail. Point them to the following articles:

- Check Skype for Business voicemail and options: This article explains how to listen to your voicemail in Skype for Business, change your voice mail greeting, change your voicemail settings, and listen to your voicemail at different speeds.
- Skype for Business 2016 training

Related topics

Set up Skype for Business Online

Here's what you get with Phone System

Plan for Skype for Business Server and Exchange Server migration

Change the default language for greetings and emails

6/10/2020 • 2 minutes to read • Edit Online

If you are a global administrator, you can set up Skype for Business to play its default voicemail greeting in another language. The default system greeting is something like, "Please leave a message for John Smith. After the tone, please record your message. When you finish recording, hang up, or press the pound key for more options."

First, read this important info:

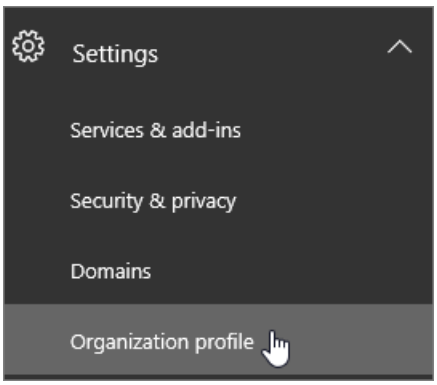
- **The languages that are available to you are determined by the location of your organization**. For example, if your organization is located in the United States, you can set the default language to English or Spanish. If your organization is located in Canada, you can choose between English and French. For a list of supported languages, see Languages for voicemail greetings and messages from Skype for Business.
- **Changing languages for individual user's voicemail greeting and voicemail messages.** You can change the preferred lanaguage for users, which will change the language of the their voicemail greeting and voicemail messages sent to their Outlook mailbox. For instruction please see [How to set language and region settings for Microsoft 365 or Office 365] (https://docs.microsoft.com/office365/troubleshoot/access-management/set-language-and-region).

  > **NOTE**
  > Users can change their own greeting language through their settings after they sign in by following instructions found in Change your display language and time zone in Microsoft 365 for Business

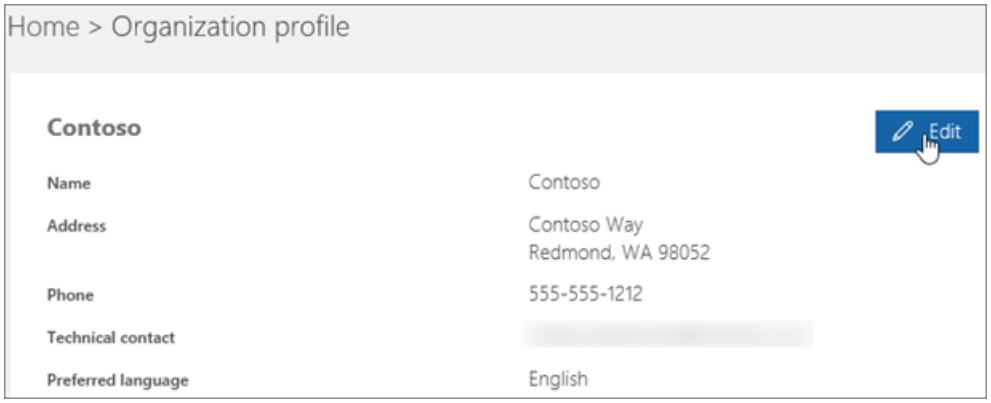
- **Do you want to record your outgoing voicemail message?** See Check Skype for Business voicemail and options. For Microsoft Teams - Users can change their voicemail settings from the Teams desktop client settings
- **Do you want to change the voicemail prompt language?** For Skype for Business - https://mysettings.lync.com/voicemail and choose a new language under **Prompt Language**. For Microsoft Teams - Users can change their voicemail greeting from the Teams desktop client settings

Change the system language for everyone in your organization

1. Sign in with your global administrator account at https://portal.office.com/adminportal/home.
2. In the Microsoft 365 admin center, choose **Settings** > **Settings** > **Organization profile**.



3. Choose **Edit**.



4. Select a language from the **Preferred language** list for everyone in your organization.
5. Choose **Save**.

Related articles for the admin

- Phone System and Calling Plans
- Set up Calling Plans
- Plan Phone System in Microsoft 365 or Office 365 with on-premises PSTN connectivity in Skype for Business Server

Related topics

- Change your display language and time zone in Microsoft 365 or Office 365 for Business
- Add a language or set language preferences in Office 2010 and later)
- Enable or change a keyboard layout language

Languages for voicemail greetings and messages

6/8/2020 • 2 minutes to read • Edit Online

You can set up Skype for Business to play its system voicemail greeting in one of the languages listed in this table.

To change the language that Skype for Business uses for system voicemail greetings, see Change the default language for voicemail greetings and emails in your organization.

Language	Country/region	Language code	Available for a user to see it in email?	Available when the user calls in?	Transcription available?
Arabic	Egypt	ar-EG	Yes	Yes	No
Catalan	Catalan	ca-ES	Yes	Yes	No
Chinese (Simplified)	China	zh-hans	Yes	Yes	Yes
Chinese (Hong Kong)	China	zh-hk	Yes, but Chinese (Traditional) (zh-hant) is used.	Yes	Yes, but Chinese (Traditional) (zh-hant) is used.
Chinese (Traditional)	Taiwan	zh-hant	Yes	Yes	No
Croatian	Croatia	hr-HR	Yes	Yes	No
Czech	Czech Republic	cs-CZ	Yes	Yes	No
Danish	Denmark	da-DK	Yes	Yes	No
Dutch	Netherlands	nl-NL	Yes	Yes	No
English	Australia	en-AU	Yes, but US English (en-US) is used.	Yes	Yes, but US English (en-US) is used.
English	Canada	en-CA	Yes, but US English (en-US) is used.	Yes	Yes, but US English (en-US) is used.
English	India	en-IN	Yes, but US English (en-US) is used.	Yes	Yes, but US English (en-US) is used.
English	United Kingdom	en-GB	Yes, but US English (en-US) is used.	Yes	Yes, but US English (en-US) is used.

English	United States	en-US	Yes	Yes	Yes
Finnish	Finland	fi-FI	Yes	Yes	No
French	Canada	fr-CA	Yes, but France French (fr-FR) is used.	Yes	Yes, but France French (fr-FR) is used.
French	France	fr-FR	Yes	Yes	Yes
German	Germany	de-DE	Yes	Yes	Yes
Greek	Greece	el-GR	Yes	Yes	No
Hungarian	Hungary	hu-HU	Yes	Yes	No
Indonesian	Indonesia	id-ID	Yes	Yes	No
Italian	Italy	it-IT	Yes	Yes	Yes
Japanese	Japan	ja-JP	Yes	Yes	Yes
Korean	Korean	ko-KR	Yes	Yes	No
Norwegian (Bokmal)	Norway	nb-NO	Yes	No	No
Polish	Poland	pl-PL	Yes	Yes	No
Portuguese	Brazil	pt-BR	Yes, but Portugal Portuguese (pt-PT) is used.	Yes	Yes
Portuguese	Portugal	pt-PT	Yes	Yes	Yes, but Brazil Portuguese (pt-BR) is used.
Romanian	Romania	ro-RO	Yes	Yes	No
Russian	Russia	ru-RU	Yes	Yes	No
Slovak	Slovakia	sk-SK	Yes	Yes	No
Slovenian	Slovenia	sl-SI	Yes	Yes	No
Spanish	Spain	es-ES	Yes	Yes	Yes
Spanish	Mexico	es-MX	Yes, but Spain Spanish (es-ES) is used.	Yes	Yes, but Spain Spanish (es-ES) is used.
Swedish	Sweden	sv-SE	Yes	Yes	No

Thai	Thailand	th-TH	Yes	Yes	No
Turkish	Turkey	tr-TR	Yes	Yes	No
Vietnamese	Vietnam	vi-VN	Yes	Yes	No

Related topics

Country and region availability for Audio Conferencing and Calling Plans

Here's what you get with Phone System

How can caller ID be used in your organization

8/26/2020 • 2 minutes to read • Edit Online

Caller ID can be controlled for both inbound and outbound calls for Phone System users by using a policy called CallingLineIdentity.

The caller ID functionality is available to all Phone System users regardless of PSTN connectivity:

- Microsoft Calling Plans
- Phone System Direct Routing
- Online PSTN Connectivity
- On-Premises PSTN Connectivity with Skype for Business Cloud Connector Edition (requires Cloud Connector Edition 1.4.2 and beyond)
- On-Premises PSTN Connectivity with Skype for Business Server (requires Skype for Business Server 2015 CU5 and beyond)

> **NOTE**
> This policy isn't available in Skype for Business 2015 Server.

Outbound caller ID

There are three options available for outbound PSTN caller ID:

- The telephone number assigned to the user, which is the default.
- A telephone number that is classified as a *service* and *toll-free* number in your Calling Plans telephone number inventory. It is usually assigned to an organizational auto attendant or call queue.
- Set to anonymous.

However, you can't assign these types of phone numbers for the outbound caller ID:

- Any phone numbers that are classified as a *user* in your Calling Plans telephone number inventory
- A Skype for Business Server on-premises phone number

To set the outbound caller ID, see Set the Caller ID for a user.

End user control of outbound caller ID

The EnableUserOverride attribute enables single or multiple users to change their caller ID setting to **Anonymous**. This only applies when a CallingLineIdentity policy is configured with a CallingIDSubstitute parameter of either LineURI or Substitute. The default value of EnableUserOverride is False.

Your end users can set their caller ID to **Anonymous** by using the **Settings** tab in the Skype for Business desktop client, select **Calls an End User** (if enabled by admin), and then select **Hide my phone number and profile information for all calls**. In Teams, users can go to their profile picture in the upper-right corner, select **Settings** > **Calls**, and then under **Caller ID**, select **Hide my phone number and profile information for all calls**.

Windows	Version	Supported
Click-to-Run	Current Channel released on December 6, 2016 - version 1611 (Build 7571.2072)	Yes
Click-to-Run	First Release for Deferred Channel released on February 22, 2017 - Version 1701 (Build 7766.2060)	Yes
Click-to-Run	Deferred Channel released on June 13, 2017 - Version 1701 (Build 7766.2092)	Yes
MSI	Skype for Business	No
Mac	Skype for Business	No

Inbound caller ID

Phone System will show called ID for an external phone number if the number is associated with a user in Azure AD. If the phone number is not in Azure AD, the telco-provided display name will be shown if it is available.

The BlockIncomingCallerID attribute allows for blocking the caller ID on incoming PSTN calls. You can set this attribute, but it isn't available to your end users on the user settings page. And it is currently available only with Online PSTN connectivity.

To set the outbound caller ID, see Set the Caller ID for a user.

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Skype for Business Online: Emergency Calling disclaimer label

Manage caller ID policies in Microsoft Teams

8/26/2020 • 2 minutes to read • Edit Online

> Don't see this feature in the Microsoft Teams admin center yet? It's currently being rolled out and might not be available in your organization yet. To stay on top of upcoming Teams features, check out the Microsoft 365 Roadmap.

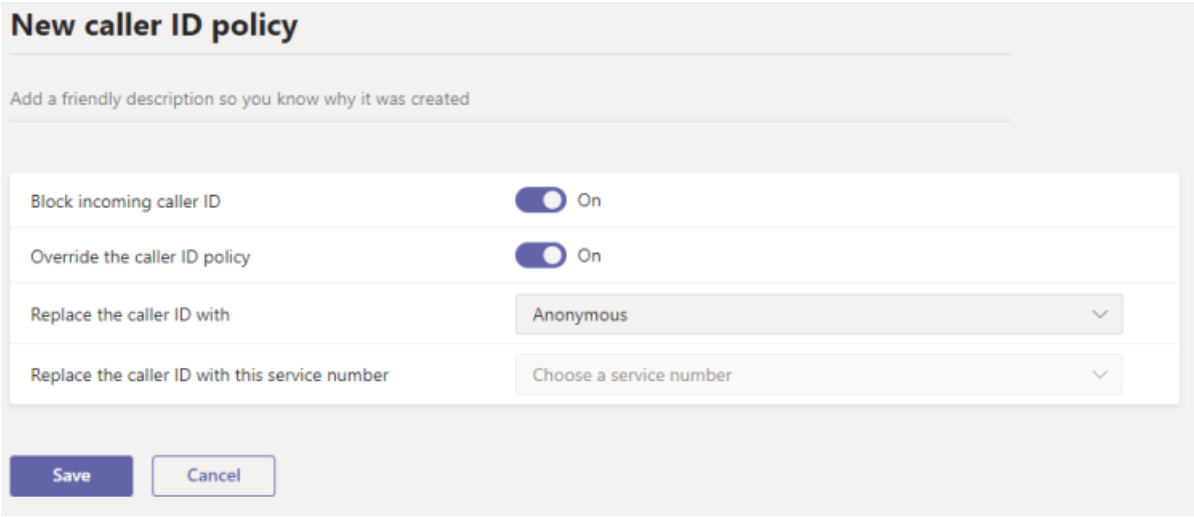
As an admin, you can use caller ID policies in Microsoft Teams to change or block the caller ID (also known as calling line ID). By default, the phone number of Teams users can be seen when they make a call to a PSTN phone and the phone number of PSTN callers can be seen when they call a Teams user. You can use caller ID policies to display an alternate phone number for Teams users in your organization or block an incoming number from being displayed.

For example, when users make a call, you can change the caller ID to display your organization's main phone number instead of users' phone numbers.

You manage caller ID policies by going to **Voice** > **Caller ID policies** in the Microsoft Teams admin center. You can use the global (Org-wide default) policy or create and assign custom policies. Users in your organization will automatically get the global policy unless you create and assign a custom policy.

Create a custom caller ID policy

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Caller ID policies**.
2. Click **Add**.



3. Enter a name and description for the policy.
4. From here, choose the settings that you want:

   - **Block incoming caller ID**: Turn on this setting to block the caller ID of incoming calls from being displayed.
   - **Override the caller ID policy**: Turn on this setting to let users override the settings in the policy regarding displaying their number to callees or not. This means that users can choose whether to display their caller ID. For more information, see End user control of outbound caller ID.
   - **Replace the caller ID with**: Set the caller ID to be displayed for users by selecting one of the following:

    - **User's number**: Displays the user's number.
    - **Service number**: Lets you set a service phone number to display as the caller ID.
    - **Anonymous**: Displays the caller ID as Anonymous.
- **Replace the caller ID with this service number**: Choose a service number to replace the caller ID of users. This option is available if you selected **Service number** in **Replace the caller ID with**.

5. Click **Save**.

Edit a caller ID policy

You can edit the global policy or any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Caller ID policies**.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. Change the settings that you want, and then click **Save**.

Assign a custom caller ID policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Related topics

New-CsCallingLineIdentity

Assign policies to your users in Teams

Set the Caller ID for a user

9/15/2020 • 5 minutes to read • Edit Online

The Phone System in Microsoft 365 and Office 365 provides a default caller ID that is the user's assigned telephone number. You can either change or block the caller ID (also called a Calling Line ID) for a user. You can learn more about how to use caller ID in your organization by going How can caller ID be used in your organization.

> **TIP**
> You can't block incoming calls currently in Skype for Business Online.

There are settings that you can change:

> **NOTE**
> This **is not** for on-premises organizations with Lync or Skype for Business Server.

- **Change their outgoing caller ID** You can replace a user's Caller ID, which by default is their telephone number, with another phone number. For example, you could change the user's Caller ID from their phone number to a main phone number for your business or change the user's Calling Line ID from their phone number to a main phone number for the legal department. You can change the Calling ID number to any Online **service** number (toll or toll-free).

  > **NOTE**
  > If you want to use the *Service* parameter, you must specify a valid service number.

- **Block their outbound caller ID** You can block the outgoing Caller ID from being sent on a user's outgoing PSTN calls. Doing this will block their phone number from being displayed on the phone of a person being called.
- **Block their incoming caller ID** You can block a user from receiving Caller ID on any incoming PSTN calls.

> **IMPORTANT**
> Emergency calls will always send the user's telephone number (caller ID).

By default, all of these caller ID settings are **turned off**. This means that the Skype for Business Online user's phone number can be seen when that user makes a call to a PSTN phone.

To learn more about these settings and how you can use them, go How can caller ID be used in your organization.

Set your caller ID policy settings

> **NOTE**
> For all of the Caller ID settings in Skype for Business Online, you must use Windows PowerShell and you **can't use** the **Skype for Business admin center**.

Verify and start Windows PowerShell

- **Check that you are running Windows PowerShell version 3.0 or higher**

1. To verify that you are running version 3.0 or higher: **Start Menu** > **Windows PowerShell**.
2. Check the version by typing *Get-Host* in the **Windows PowerShell** window.
3. If you don't have version 3.0 or higher, you need to download and install updates to Windows PowerShell. See Windows Management Framework 4.0 to download and update Windows PowerShell to version 4.0. Restart your computer when you are prompted.
4. You will also need to install the Windows PowerShell module for Skype for Business Online that enables you to create a remote Windows PowerShell session that connects to Skype for Business Online. This module, which is supported only on 64-bit computers, can be downloaded from the Microsoft Download Center at Windows PowerShell Module for Skype for Business Online. Restart your computer if you are prompted.

   If you need to know more, see Connect to all Microsoft 365 or Office 365 services in a single Windows PowerShell window.

- **Start a Windows PowerShell session**

1. From the **Start Menu** > **Windows PowerShell**.
2. In the **Windows PowerShell** window, connect to your Microsoft 365 or Office 365 by running:

   > **NOTE**
   > Skype for Business Online Connector is currently part of the latest Teams PowerShell module. If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

   ```
   Import-Module -Name MicrosoftTeams
   $credential = Get-Credential
   $session = New-CsOnlineSession -Credential $credential
   Import-PSSession $session
   ```

If you want more information about starting Windows PowerShell, see Connect to all Microsoft 365 or Office 365 services in a single Windows PowerShell window or Set up your computer for Windows PowerShell.

See all of the caller ID policy settings in your organization

- To view all of the caller ID policy settings in your organization, run:

  ```
  Get-CsCallingLineIdentity |fl
  ```

  See more examples and details for Get-CsCallingLineIdentity.

Create a new caller ID policy for your organization

- To create a new caller ID policy that sets the caller ID to anonymous, run:

```
New-CsCallingLineIdentity  -Identity Anonymous -Description "Anonymous policy" -CallingIDSubstitute
Anonymous -EnableUserOverride $false
```

> **NOTE**
> In all cases, the "Service Number" field should not include an initial "+".

See more examples and details for New-CsCallingLineIdentity.

- To apply the new policy you created to Amos Marble, run:

```
Grant-CsCallingLineIdentity -Identity "amos.marble@contoso.com" -PolicyName Anonymous
```

See more on the Grant-CsCallingLineIdentity cmdlet.

If you have already created a policy, you can use the Set-CsCallingLineIdentity cmdlet to make changes to the existing policy, and then use the Grant-CsCallingLineIdentity cmdlet to apply the settings to your users.

Set it so the incoming caller ID is blocked

- To block the incoming caller ID, run:

```
Set-CsCallingLineIdentity  -Identity "Block Incoming" -BlockIncomingPstnCallerID $true -
EnableUserOverride $true
```

See more examples and details for Set-CsCallingLineIdentity.

- To apply the policy setting you created to a user in your organization, run:

```
Grant-CsCallingLineIdentity -Identity "amos.marble@contoso.com" -PolicyName "Block Incoming"
```

See more on the Grant-CsCallingLineIdentity cmdlet.

Remove a caller ID policy

To remove a policy from your organization, run:

```
Remove-CsCallingLineIdentity -Identity "My Caller ID Policy"
```

To remove a policy from a user, run:

```
Grant-CsCallingLineIdentity -Identity "amos.marble@contoso.com" -PolicyName $null
```

Want to know more about Windows PowerShell?

- Windows PowerShell is all about managing users and what users are allowed or not allowed to do. With Windows PowerShell, you can manage Microsoft 365 or Office 365 and Skype for Business Online using a single point of administration that can simplify your daily work, when you have multiple tasks to do. To get started with Windows PowerShell, see these topics:
  - An introduction to Windows PowerShell and Skype for Business Online
  - Six Reasons Why You Might Want to Use Windows PowerShell to Manage Microsoft 365 or Office

365

- Windows PowerShell has many advantages in speed, simplicity, and productivity over only using the Microsoft 365 admin center such as when you are making setting changes for many users at one time. Learn about these advantages in the following topics:
  - Best ways to manage Microsoft 365 or Office 365 with Windows PowerShell
  - Using Windows PowerShell to manage Skype for Business Online
  - Using Windows PowerShell to do common Skype for Business Online management tasks

Related topics

Transferring phone numbers common questions

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Skype for Business Online: Emergency Calling disclaimer label

More about Calling Line ID and Calling Party Name

8/26/2020 • 2 minutes to read • Edit Online

CallerID, as it is typically referred to, actually consists of two user-facing identifiable pieces of information: - A phone number (typically referred to as CLID or calling line ID) - Calling party name (typically referred to as CNAM) which can be up to 15 characters in length.

When a call is made, the CLID (phone number) is routed to the destination's carrier (also known as the terminating carrier). The CNAM info for the call may or may not be routed with the call as this depends on how the country has implemented CNAM (if at all). The reliability of CNAM delivery with the call varies depending on the country and carriers which handle the call either as an intermediary and/or a terminating carrier.

CLID & CNAM transmission is the responsibility of the terminating carrier insofar as the terminating carrier must support CLID & CNAM functionality as well as provide up to date records for both values. Microsoft reliably provides CLID values when originating calls, but those values may not be kept intact once they pass through an intermediary carrier or the terminating carrier. Unfortunately, in the event the CLID value is changed, omitted or truncated by the intermediary or terminating carrier, Microsoft has little to no recourse in correcting such problems in the public telephone network.

Inconsistencies in CNAM can be caused by delays in intermediate or terminating carriers refreshing CNAM info in authoritative databases as in the case of the United States. In countries where there is no authoritative database for CNAM, individual carrier practices can also cause problems with CNAM information arriving intact with the call. Microsoft currently does not support originating CNAM information in countries other than the United States."

Related topics

Plan for Teams auto attendants and call queues

12/5/2020 • 13 minutes to read • Edit Online

Auto attendants allow you to set up menu options to route calls based on caller input. Menu options, such as "For Sales, press 1. For Services press 2", for an auto attendant let an organization provide a series of choices that guide callers to their destination quickly, without relying on a human operator to handle incoming calls.

Call queues are waiting areas for callers. For situations where callers need to reach someone with a particular specialty - such as sales or service - rather than a specific person, you can use call queues to connect callers to the group of agents who can assist them. Callers are put on hold until an agent assigned to the queue is available to take their call.

Used together, auto attendants and call queues can easily route callers to the appropriate person or department in your organization.

Auto attendants

The primary purpose of an auto attendant is to direct a caller to an appropriate person or department based on the caller's input to the provided menu options. Callers can be directed to specific people within your organization, to call queues where they wait to talk to the next available agent, or to voicemail. Different call routing options can be specified for business hours, off hours, and holidays.

Menu prompts can be created by using text-to-speech (system-generated prompts) or by uploading a recorded audio file. Speech recognition accepts voice commands for hands-free navigation, but people calling in can also use the phone keypad to navigate menus.

Each auto attendant has a specific language and time zone. If you do business in multiple languages or multiple parts of the world, you can create as many different auto attendants as you need to accommodate your callers.

For each auto attendant, you can configure an operator. While you can configure operator calls to go to a variety of destinations, the operator feature is designed to allow callers to talk to a specific person in your organization who can help them.

Auto attendants can be configured to allow callers to search your organization's directory, either by name or by extension number. Within an auto attendant, you can specify who is available for the directory search by choosing groups of users to include or exclude. (This is known as *dial scope*.)

Callers can reach an auto attendant either by direct phone number, if configured, or by being redirected from another auto attendant or a call queue.

Call queues

A call queue is analogous to a waiting room in a physical building. Callers wait on hold while calls are routed to the agents in the queue as they become available. Call queues are commonly used for sales and service functions. However, call queues can be used for any situation where the number of calls exceeds your internal capacity, such as a receptionist in a busy facility.

Call queues allow for specific routing of calls in cases where the total number of callers in the queue or the wait time exceeds the limits that you specify. Calls can be routed to specific people, voicemail, other call queues, or auto attendants.

Like auto attendants, call queues each have a language setting. You can use different call queues if you do business in multiple languages. Agents can be members of more than one queue if they're multi-lingual.

For each call queue, you can specify if agents in the queue can opt out of taking calls and if calls should be routed to them based on their presence indication in Teams.

You can assign a phone number to a call queue, however call queues do not provide separate call routing for off hours and holidays. Unless your call queue is staffed 24/7, we recommend assigning the phone number to an auto attendant that redirects to the call queue during business hours.

Prerequisites

To configure auto attendants and call queues, you need the following resources:

- A resource account for each auto attendant and each call queue
- A free Phone System - Virtual User license for each resource account
- At least one Microsoft service number, direct routing number, or a hybrid number for each resource account that you want to be directly dialable
- The service number may be a toll or toll-free number

Agents who receive calls from the call queues must be Enterprise Voice enabled online or on-premise users.

If your agents are using the Microsoft Teams app for call queue calls, they need to be in TeamsOnly mode.

When transferring calls to an external phone number, the resource account performing the transfer (that is, the one associated with the auto attendant or call queue) must have a phone number and a Microsoft 365 Phone System Virtual User license. Additionally:

- For a resource account with a Calling Plan number, assign a Calling Plan license.
- For a resource account with a Direct Routing number, assign an online voice routing policy.

> **NOTE**
> Direct Routing service numbers for auto attendant and call queues are supported for Microsoft Teams users and call agents only.
> Transfers between Calling Plan trunks and Direct Routing trunks aren't supported.

Business decisions

Before you set up your auto attendants and call queues, there are some decisions that you should make about how to use these features in your business. These decisions will determine the settings that you choose when you configure your auto attendants and call queues.

Document your answers to these questions and provide the information to the administrator doing the configuration.

- What languages do you need? Where are these languages needed - which department or group?
- Do you want to allow voice inputs from callers or only dialing inputs?
- Do you need separate call routing for off hours or holidays? What are the hours and holidays?
- Do you want to allow agents in a call queue to opt out of taking calls?
- Do you want agents in your call queues or your operator to have a specific caller ID if they dial out?
- Do you want to enable call parking and retrieval in your organization to assist in call handoffs between people or departments?
- For the voice prompts, do you want to record your own or use the system-generated voice? (The system-generated voice is easy to update.)

Technical decisions

When using auto attendants and call queues to connect callers to people in your organization, there are some technical decisions to make before you start the configuration.

Agents can be added to call queues in the following ways:

- Individual users
- Distribution lists
- Security groups, including mail-enabled security groups
- Microsoft 365 Groups or Teams

You can use a combination of these options for each queue if needed. Groups that have an email address can be used for voicemail. Using Teams offers a number of advantages, including shared file storage and chat between agents, a common mailbox where voicemails can be received, and an extensible platform that can include integration with your line of business applications or Power Apps.

We recommend choosing a strategy for adding call agents to queues before you start your configuration.

If you have an existing auto attendant and call queue infrastructure and you're migrating to Teams, you'll need a plan to transfer your existing phone numbers to the new auto attendants and call queues. You might need to create a port order to move your numbers from another providers. We recommend that you temporarily acquire one or more new phone numbers and test your auto attendant and call queue flows before switching them over the numbers you currently have in service.

Conference mode is an option in call queues that significantly reduces the amount of time it takes to connect Teams VOIP calls and PSTN calls to an agent. For conference mode to work, agents in the call queue must use one of the following clients:

- The latest version of the Microsoft Teams desktop client, Android app, or iOS app
  - Microsoft Teams phone version 1449/1.0.94.2020051601 or later

Set Agents' Teams accounts to Teams-only mode. Agents who don't meet the requirements aren't included in the call routing list.

We recommend enabling conference mode for your call queues if your agents are all using compatible clients.

> **NOTE**
> Busy on Busy is not supported by conference mode. Agents on non-call queue calls may still be presented with a call queue call if presence-based routing is not enabled.

Plan your call routing flow

As part of the planning process, we recommend that you work out the call routing for your organization in a diagram. The diagram helps determine the most efficient routing for people calling in to your organization. You can also use the diagram to determine the auto attendants and call queues that you need to create, along with related requirements such as service numbers, licenses, and resource accounts.

Let's look at how auto attendants and call queues route calls.

Auto attendants route all calls in one of the following ways:

- **Redirect immediately** - calls can be redirected to one of the call routing destinations (listed below) immediately upon answering or after an initial greeting.
- **Redirect based on dial options** - callers can be directed to choose between options that are assigned to the numbers on their telephone keypad, 0-9. Each dial key can be assigned a call routing destinations.
- **Dial people by name or extension** - callers can be directed to dial the extension number of the person

they're trying to reach in your organization's directory, or by spelling the person's name.

- **Disconnect** - an auto attendant can hang up the call.

> **NOTE**
>
> A single Auto attendant can only support a single "dial by" method. To allow callers to dial by name and by number, you will need to create an auto attendant that has an option for dial by name and the another for dial by extension. Each of these options will route to separate auto attendants configured for these "dial by" scenarios.

When calls are redirected by an auto attendant or call queue, you can choose from the following call routing destinations:

- **Person in the organization** - a person in your organization who is able to receive voice calls. This can be an online user or a user hosted on-premises using Skype for Business Server.
- **Voice app** - another auto attendant or a call queue. Choose the resource account associated with the destination.
- **External phone number** - any phone number. (See external transfer technical details).
- **Voicemail** - the voice mailbox associated with a Microsoft 365 group that you specify.
- **Operator** (auto attendant only) - the operator defined for the auto attendant. Defining an operator is optional. An operator can be any of the other destinations in this list.

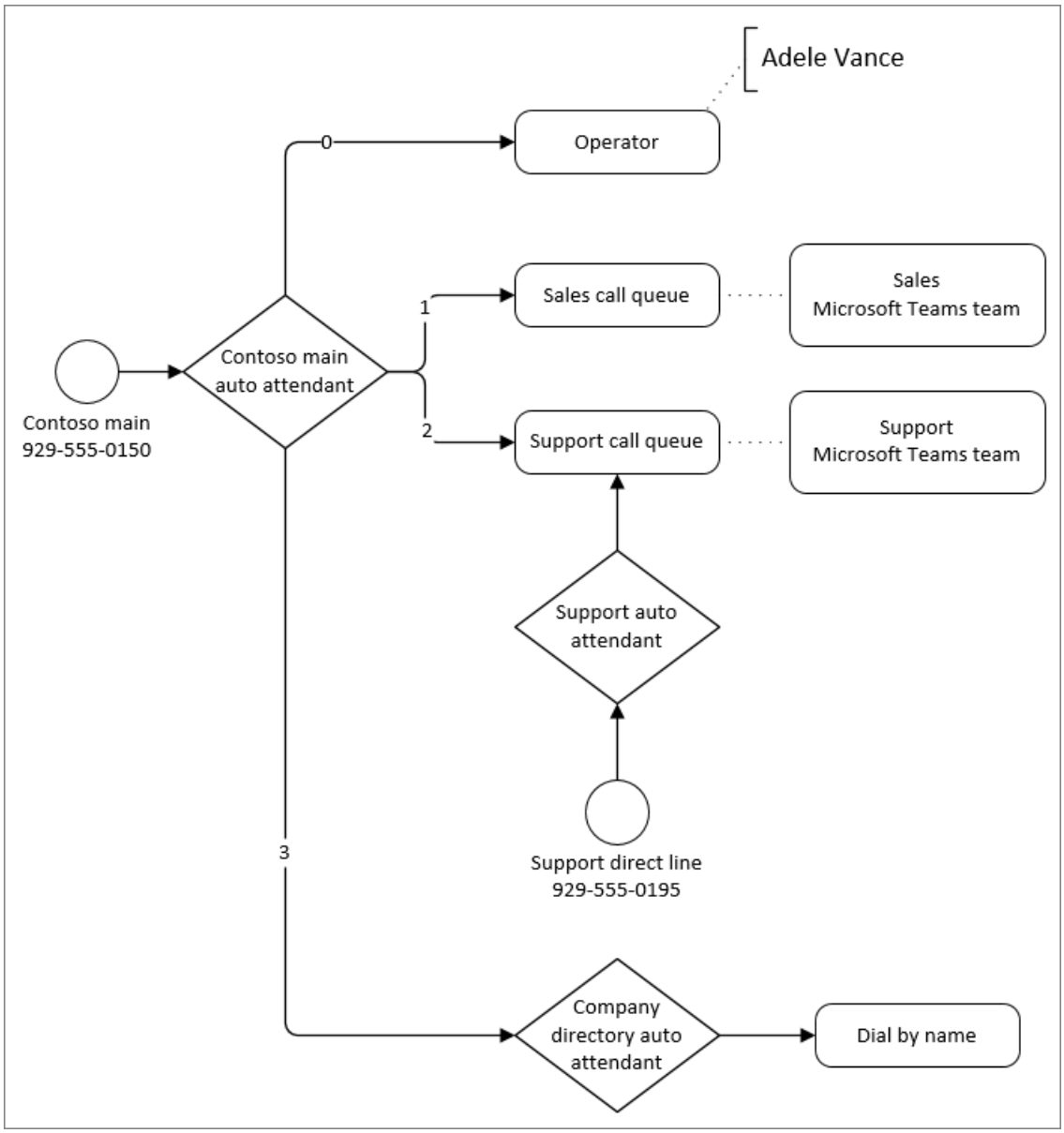
Auto attendants offer separate call routing options for calls received outside of business hours and on holidays. After-hours call routing allows all the options listed above, while holiday call routing allows only redirecting or disconnecting a call, but no dial key options.

Call queues place the caller on hold until an agent assigned to the queue is available to take their call. There are two situations where a caller might be directed out of the queue:

- **Call overflow** - if the number of calls in the queue exceeds the limit that you set, then new callers are redirected out of the queue.
- **Call timeout** - if a caller has been in the queue longer than the configured timeout setting, they're redirected out of the queue.

Calls redirected out of a queue can be sent to any of the call routing destinations listed above except for an operator. (Call queues don't have operators, but you can redirect callers to the same destination as an operator that you've configured for an auto attendant.)

The example below shows an example of call routing using auto attendants and call queues.



In the example above:

- The zero (0) key redirects callers to an operator. The operator for that auto attendant has been configured as a **Person in the organization**.
- The one (1) key redirects callers to the sales call queue. This call queue is connected to a team that contains the sales team assigned to the queue.
- The two (2) key redirects callers to the support call queue. This call queue is connected to a team that contains the support team assigned to the team.
- The support call queue has a direct phone number via an intervening auto attendant. Having an auto attendant answer the support line allows for separate off hours and holiday call routing.
- The three (3) key redirects users to another auto attendant for the company directory. The company directory auto attendant allows callers to call individuals in the organization by dialing their name or extension.

We recommend that you create one or more diagrams similar to the one above to map out your call routing. Be sure to include the following in your diagram or accompanying documentation:

- Which auto attendants will have direct access via phone numbers?
- What are the off-hours and holiday routing requirements for each auto attendants?
- The membership for each call queue. (You can add users individually or map the queue to different kinds of groups. Mapping a queue to a team provides the most versatile experience.)

Here are some call routing best practices:

- Look at your existing calling system and analyze the types and frequency of incoming calls. Use this information to help inform your auto attendant and call queue structure.
- Put the most common options earliest in the menu to route calls as quickly as possible.
- Avoid connecting service numbers directly to call queues unless the queues are available 24/7. Call queues don't allow for separate call handling for off hours or holidays. If you want to have a queue with a direct number, assign the number to an auto attendant that automatically redirects to the queue during business hours.
- If you receive numerous calls requesting basic information about your company, such as business hours, location, or web site address, consider creating an auto attendant to answer these questions with recorded messages.
- Keep the list of menu items to five or fewer. Callers can have trouble remembering more than five options. Use nested auto attendants if more options are needed to properly route a call.
- Describe the service first, followed by the option to press (eg: For Sales press 1) rather than the other way around (eg. Press 1 for Sales).
- User terminology your callers will understand rather than what you may use internally.
- Avoid frequent updates to call routing. If you change your menu options for an auto attendant in the future, call that out in the voice prompts for the first 30 days.

Getting started

Once you've completed the planning tasks in this article, follow these steps to get your auto attendants and call queues set up:

1. Get the service numbers that you need for the auto attendants and call queues that you want to be accessible by direct dialing from outside your organization. This might include transferring numbers from another provider or requesting new service numbers.
2. Get a Phone System - Virtual User license for each resource account that you plan to create. These licenses are free, so we suggest getting a few extra in case you decide to make changes to your resource accounts in the future.
3. Create a resource account for each auto attendant and call queue that you want to create. Assign each account a Phone System - Virtual User license and, optionally, a service number.
4. Create the holidays for which you want to have separate call routing in your auto attendants.
5. Optionally, set up call parking and retrieval if you want to use this feature to help with call transfers.
6. Create the groups that you want to use to contain the call agents for the call queues.
7. If you plan to allow dial by extension, ensure that you've added your users' extension number to their Azure Active Directory profile.

Once you've completed the steps above, you're ready to create your auto attendants and call queues. Because auto attendants and call queues can redirect calls to each other, refer to the workflow diagram that you created to determine which auto attendant or call queue should be created first. In the example in the diagram above, you would create the sales and support call queues before you create the Contoso main auto attendant because the main auto attendant needs to direct callers to the sales and support call queues.

See the following articles for information on how to create auto attendants and call queues:

- Set up an auto attendant
- Create a call queue

Related topics

Plan Direct Routing

Country and region availability for Audio Conferencing and Calling Plans

Small business example - Set up an auto attendant

Set up an auto attendant

12/5/2020 • 9 minutes to read • Edit Online

Auto attendants let people call your organization and navigate a menu system to speak to the right department, call queue, person, or an operator. You can create auto attendants for your organization with the Microsoft Teams admin center, or with PowerShell.

Be sure you have read Plan for Teams auto attendants and call queues and followed the getting started steps before you follow the procedures in this article.

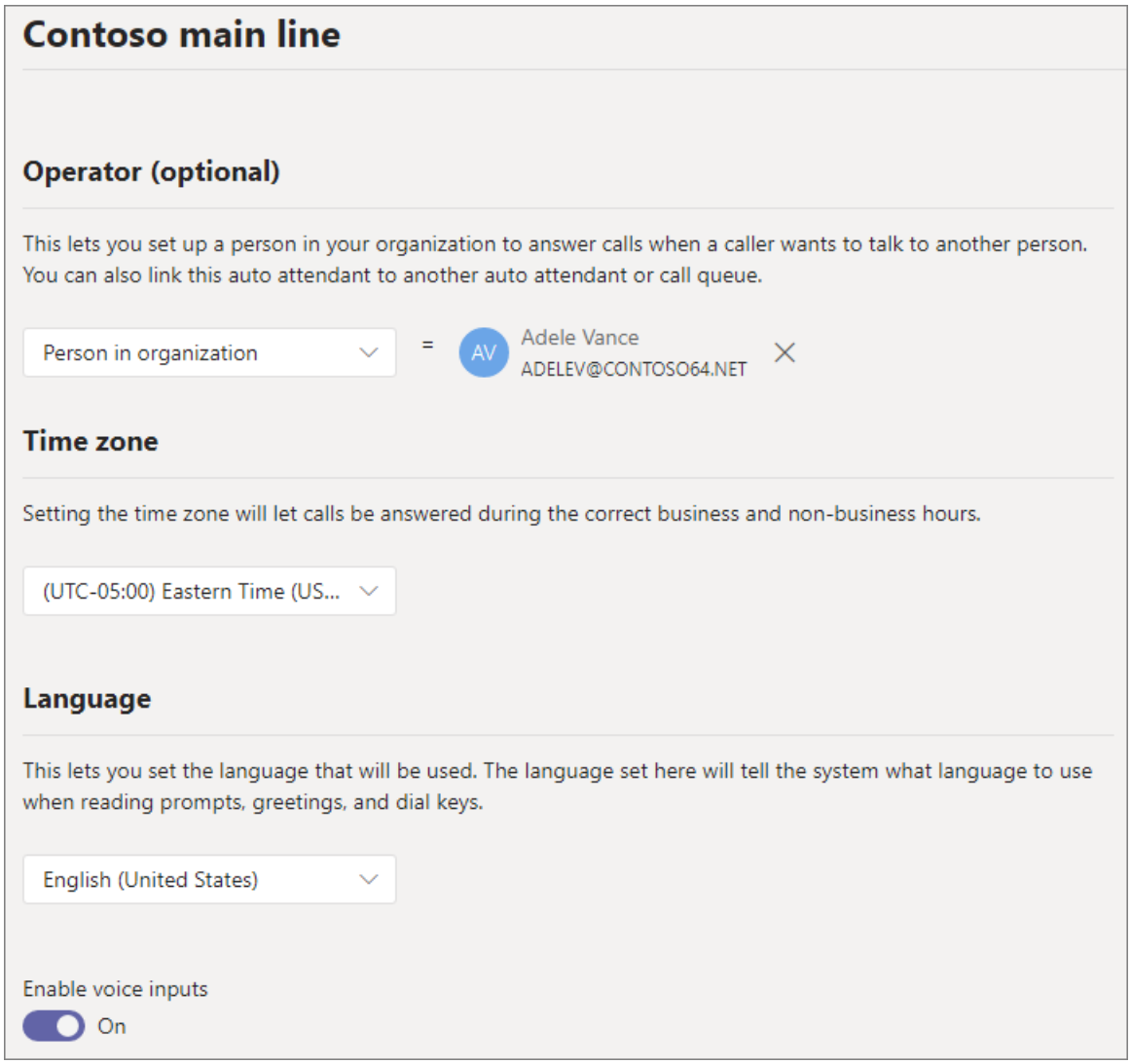
Auto attendants can direct calls, based on callers' input, to one of the following destinations:

- **Person in the organization** - a person in your organization who is able to receive voice calls. This can be an online user or a user hosted on-premises using Skype for Business Server.
- **Voice app** - another auto attendant or a call queue. (Choose the resource account associated with the auto attendant or call queue when choosing this destination.)
- **External phone number** - any phone number. (See external transfer technical details).
- **Voicemail** - the voice mailbox associated with a Microsoft 365 group that you specify.
- **Operator** - the operator defined for the auto attendant. Defining an operator is optional. The operator can be defined as any of the other destinations in this list.

You'll be prompted to choose one of these options at various stages as you set up an auto attendant.

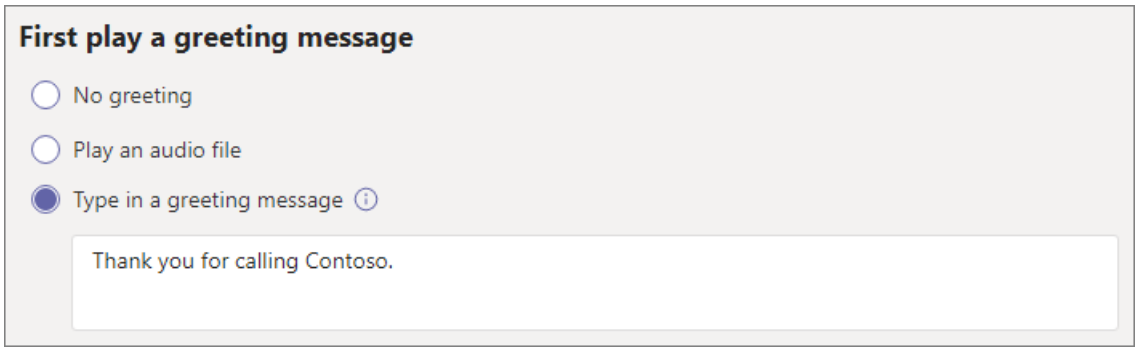
To set up an auto attendant, in the Teams admin center, expand **Voice**, click **Auto attendants**, and then click **Add**.

General info



1. Type a name for the auto attendant in the box at the top.
2. If you want to designate an operator, specify the destination for calls to the operator. This is optional (but recommended). You can set the **Operator** option to allow callers to break out of the menus and speak to a designated person.
3. Specify the time zone for this auto attendant. The time zone is used for calculating business hours if you create a separate call flow for after hours.
4. Specify a language for this auto attendant. This the language that will be used for system-generated voice prompts.
5. Choose if you want to enable voice inputs. When enabled, the name of every menu option becomes a speech-recognition keyword. For example, callers can say "One" to select the menu option mapped to key 1, or they can say "Sales" to select the menu option named "Sales."
6. Click **Next**.

Call flow



Choose if you want to play a greeting when the auto attendant answers a call.

If you select **Play an audio file** you can use the **Upload file** button to upload a recorded greeting message saved as audio in .WAV, .MP3, or .WMA format. The recording can be no larger than 5 MB.

If you select **Type a greeting message** the system will read the text you the text that you type (up to 1000 characters) when the auto attendant answers a call.



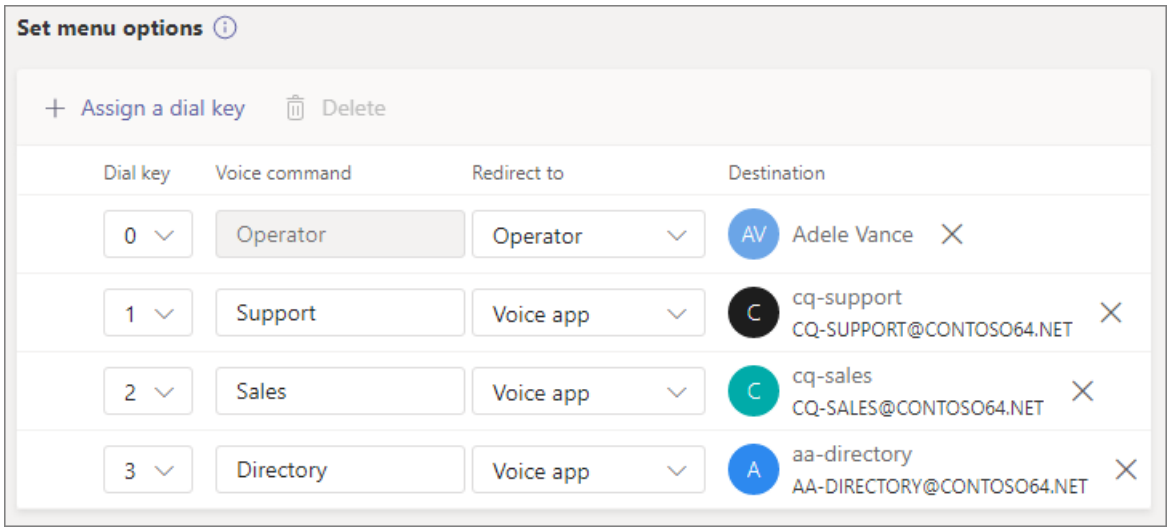
Choose how you want to route the call.

If you select **Disconnect**, the auto attendant will hang up the call.

If you select **Redirect call**, you can choose one of the call routing destinations.

If you select **Play menu options**, you can choose to **Play an audio file** or **Type in a greeting message** and then choose between menu options and directory search.

Menu options



For dialing options, you can assign the 0-9 keys on the telephone keypad to one of the call routing destinations. (The keys * (Repeat) and # (Back) are reserved by the system and can't be reassigned.)

Key mappings don't have to be continuous. It is possible, for example, to create a menu with keys 0, 1, and 3 mapped to options, while the 2 key isn't used.

We recommend mapping the 0 key to the operator if you have configured one. If the operator isn't set to any key, the voice command "Operator" is also disabled.

For each menu option, specify the following:

- **Dial key** - the key on the telephone keypad to access this option. If voice inputs are available, callers can also say this number to access the option.
- **Voice command** - defines the voice command that a caller can give to access this option, if voice inputs are enabled. It can contain multiple words like "Customer Service" or "Operations and Grounds." For example, the caller can press 2, say "two," or say "Sales" to select the option mapped to the 2 key. This text is also rendered by text to speech for the service confirmation prompt, which might be something like "Transferring your call to sales."
- **Redirect to** - the call routing destination used when callers choose this option. If you are redirecting to an auto attendant or call queue, choose the resource account associated with it.

Directory search

If you assign dial keys to destinations, we recommend that you choose **None** for **Directory search**. If a caller attempts to dial a name or extension using keys that are assigned to specific destinations, they may be unexpectedly routed to a destination before they finish entering the name or extension. We recommend that you create a separate auto attendant for directory search and have your main auto attendant link to it via a dial key.

If you didn't assign dial keys, then choose an option for **Directory search**.

Dial by name - If you enable this option, callers can say the user's name or type it on the telephone keypad. Any online user with a Phone System license, or any user hosted on-premises using Skype for Business Server, is an eligible user and can be found with Dial by name. (You can set who is and is not included in the directory on the Dial scope page.)

Dial by extension - If you enable this option, callers can connect with users in your organization by dialing their phone extension. Any online user with a Phone System license, or any user hosted on-premises using Skype for Business Server, is an eligible user and can be found with **Dial by extension**. (You can set who is and is not included in the directory on the Dial scope page.)

Users you wish to make available for Dial By Extension need to have an extension specified as part of one of the following phone attributes defined in Active Directory or Azure Active Directory (See Add users individually or in

bulk for more information.)

- OfficePhone
- HomePhone
- Mobile/MobilePhone
- TelephoneNumber/PhoneNumber
- OtherTelephone

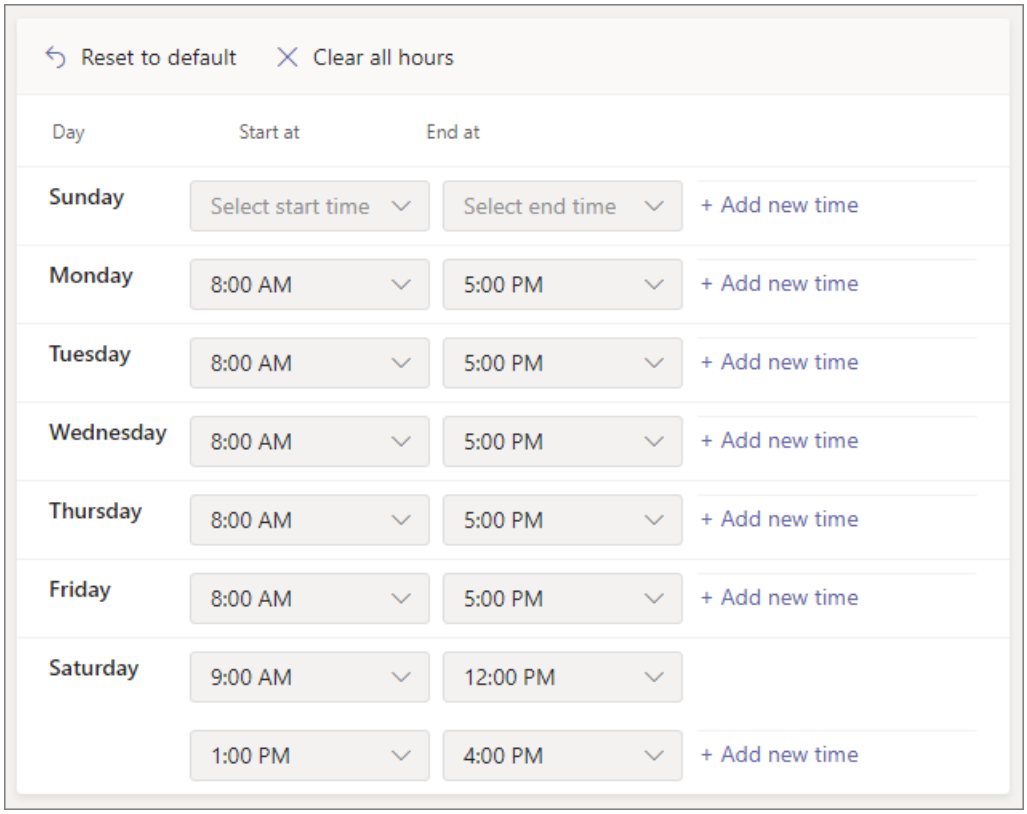
The required format to enter the extension in the user phone number field is either *+<phone number>;ext=<extension>* or *+<phone number>;x<extension>*. Example: Set-MsolUser -UserPrincipalName usern@domain.com -Phonenumber "+15555555678;ext=5678".

You can set the extension in the Microsoft 365 admin center or the Azure Active Directory admin center. It can take up to 12 hours before changes are available to auto attendants and call queues.

> **NOTE**
> If you want to use both the **Dial by name** and **Dial by extension** features, you can assign a dial key on your main auto attendant to reach an auto attendant enabled for **Dial by name**. Within that auto attendant, you can assign the 1 key (which has no letters associated with it) to reach the **Dial by extension** auto attendant.

Once you have selected a **Directory search** option, click **Next**.

Call flow for after hours



Business hours can be set for each auto attendant. If business hours aren't set, all days and all hours in the day are considered business hours because a 24/7 schedule is set by default. Business hours can be set with breaks in time during the day, and all of the hours that are not set as business hours are considered after-hours. You can set different incoming call-handling options and greetings for after-hours.

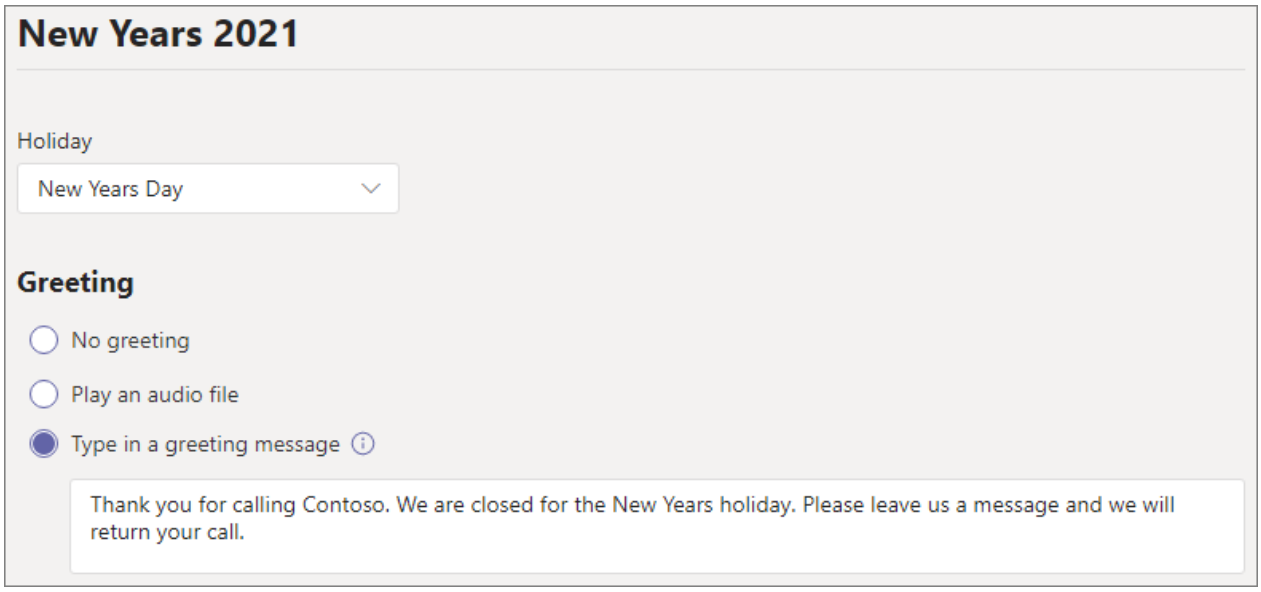
Depending on how you have configured your auto attendants and call queues, you may only need to specify after-hours call routing for auto attendants with direct phone numbers.

If you want separate call routing for after-hours callers, then specify your business hours for each day. Click **Add new time** to specify multiple sets of hours for a given day, for example, to specify a lunch break.

Once you have specified your business hours, then choose your call routing options for after hours. The same options are available as for the business hours call routing that you specified above.

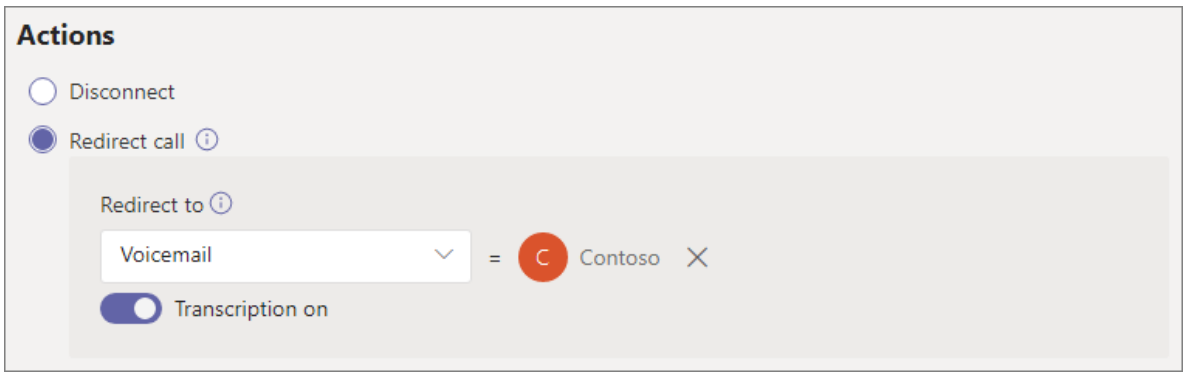
Click **Next** when you're done.

Call flows during holidays

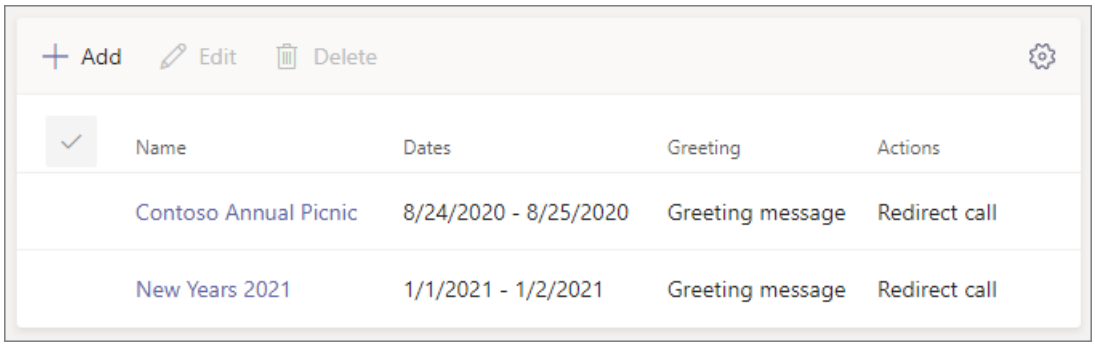


Your auto attendant can have a call flow for each Holiday you've set up. You can add up to 20 scheduled holidays to each auto attendant.

1. On the Holiday call settings page, click **Add**.
2. Type a name for this holiday setting.
3. From the **Holiday** dropdown, choose the holiday that you want to use.
4. Choose the type of greeting that you want to use.



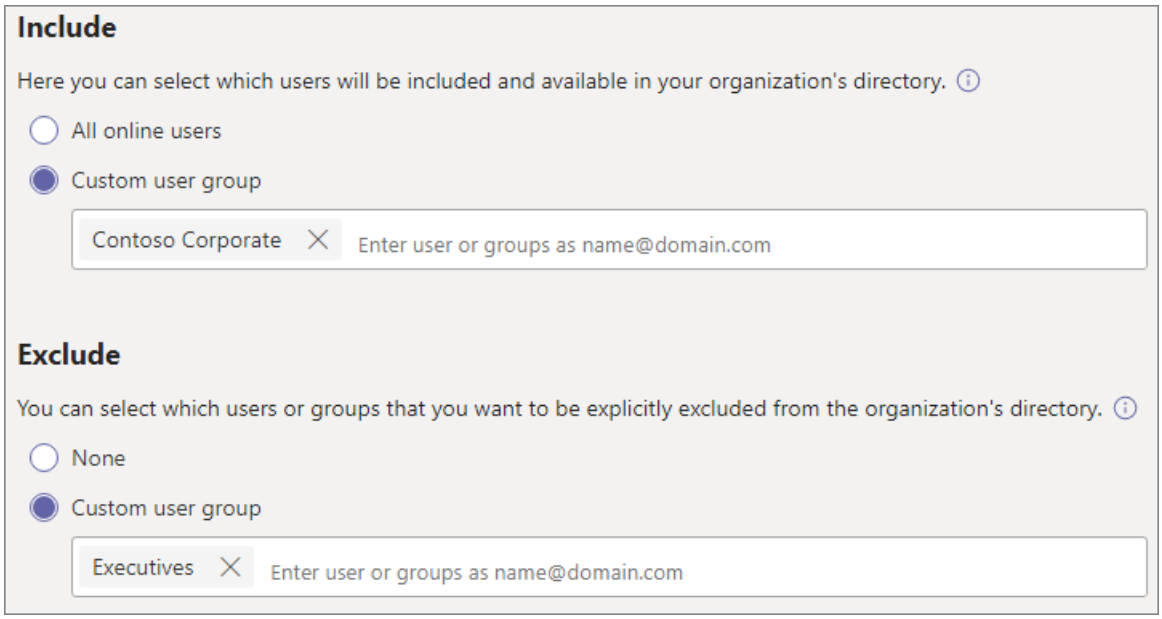
5. Choose if you want to **Disconnect** or **Redirect** the call.
6. If you chose to redirect, choose the call routing destination for the call.
7. Click **Save**.



Repeat the procedure as needed for each additional holiday.

When you've added all your holidays, click **Next**.

Dial scope



The *dial scope* defines which users are available in the directory when a caller uses dial-by-name or dial-by-extension. The default of **All online users** includes all users in your organization that are Online users with a Phone System license or hosted on-premises using Skype for Business Server.

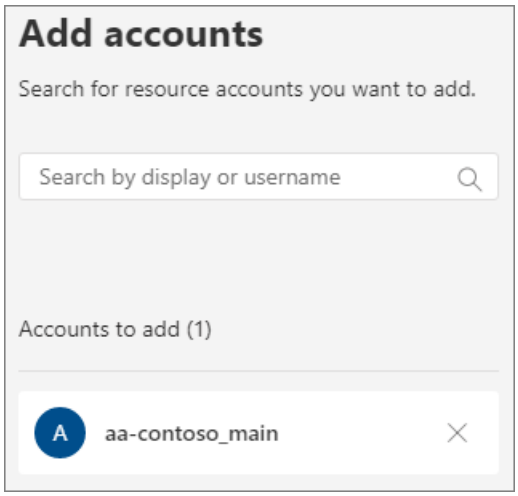
You can include or exclude specific users by selecting **Custom user group** under **Include** or **Exclude** and choosing one or more Microsoft 365 groups, distribution lists, or security groups. For example, you might want to exclude executives in your organization from the dialing directory. (If a user is in both lists, they will be excluded from the directory.)

> **NOTE**
> It might take up to 36 hours for a new user to have their name listed in the directory.

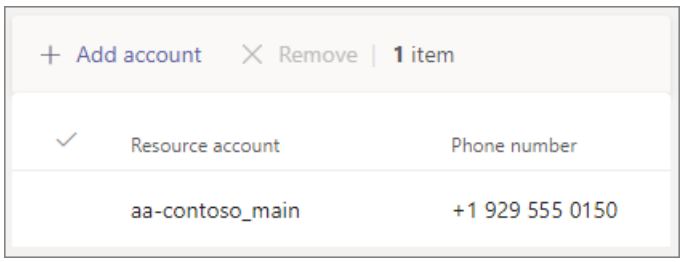
When you're done setting the dial scope, click **Next**.

Resource accounts

All auto attendants must have an associated resource account. First level auto attendants will need at least one resource account that has an associated service number. If you wish, you can assign several resource accounts to an auto attendant, each with a separate service number.



To add a resource account, click **Add account** and search for the account that you want to add. Click **Add**, and then click **Add**.



When you have finished adding service accounts, click **Submit**. This completes the auto attendant configuration.

External phone number transfers - technical details

Please refer to the Prerequisites in order to allow auto attendants to transfer calls externally. In addition:

- For a resource account with a Calling Plan number, the external transfer phone number must be entered in E.164 format (+[country code][area code][phone number]).
- For a resource account with a Direct Routing number, the external transfer phone number format is dependant on the Session Border Controller (SBC) settings.

The outbound phone number that's displayed is determined as follows:

- For Calling Plan numbers, the original caller's phone number is displayed.
- For Direct Routing numbers, the number sent is based on the P-Asserted-Identity (PAI) setting on the SBC, as follows:
  - If set to Disabled, the original caller's phone number is displayed. This is the default and recommended setting.
  - If set to Enabled, the resource account phone number is displayed.

In a Skype for Business hybrid environment, to transfer an auto attendant call to the PSTN, create a new on-premises user with call forwarding set to the PSTN number. The user must be enabled for Enterprise Voice and have a voice policy assigned. To learn more, see Auto attendant call transfer to PSTN.

Create an auto attendant with PowerShell

You can also use PowerShell to create and set up auto attendants. Here are the cmdlets that you need to manage an auto attendant:

- New-CsAutoAttendant
- Set-CsAutoAttendant
- Get-CsAutoAttendant

- Get-CsAutoAttendantHolidays
- Remove-CsAutoAttendant
- New-CsAutoAttendantMenu
- New-CsOnlineAudioFile
- New-CsAutoAttendantCallFlow
- Export-CsAutoAttendantHolidays
- New-CsOnlineTimeRange
- New-CsOnlineDateTimeRange
- New-CsOnlineSchedule
- Get-CsAutoAttendantSupportedTimeZone
- New-CsAutoAttendantCallHandlingAssociation
- Get-CsAutoAttendantSupportedLanguage
- Import-CsAutoAttendantHolidays
- New-CsAutoAttendantCallableEntity

Related topics

Here's what you get with Phone System

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Small business example — Set up an auto attendant

An introduction to Windows PowerShell and Skype for Business Online

Create a call queue

12/5/2020 • 7 minutes to read • Edit Online

Call queues provide a method of routing callers to people in your organization who can help with with a particular issue or question. Calls are distributed one at a time to the people in the queue (who are known as *agents*).

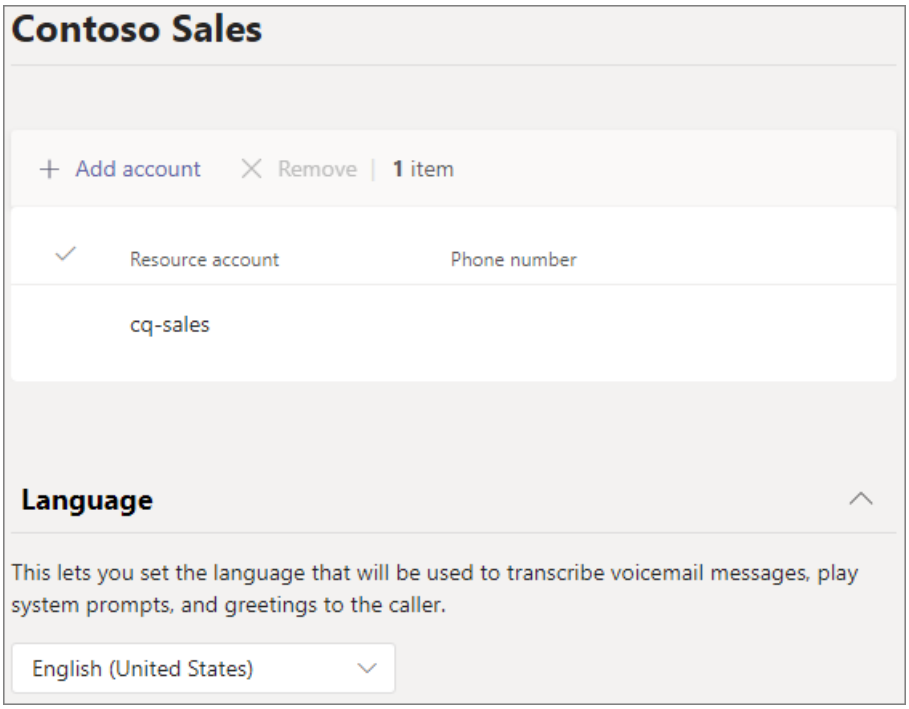
Call queues provide:

- A greeting message.
- Music while people are waiting on hold in a queue.
- Call routing - in *First In, First Out* (FIFO) order - to agents.
- Handling options for queue overflow and timeout.

Be sure you have read Plan for Teams auto attendants and call queues and followed the getting started steps before you follow the procedures in this articles.

To set up a call queue, in the Teams admin center, expand **Voice**, click **Call queues**, and then click **Add**.

Resource account and language



1. Type a name for the call queue. Agents will see this name when they receive an incoming call from the queue.
2. Click **Add accounts**, search for the resource account that you want to use with this call queue, click **Add**, and then click **Add**.
3. Choose a language. This language will be used for system-generated voice prompts and voicemail transcription (if you enable them).

Greetings and music on hold in queue

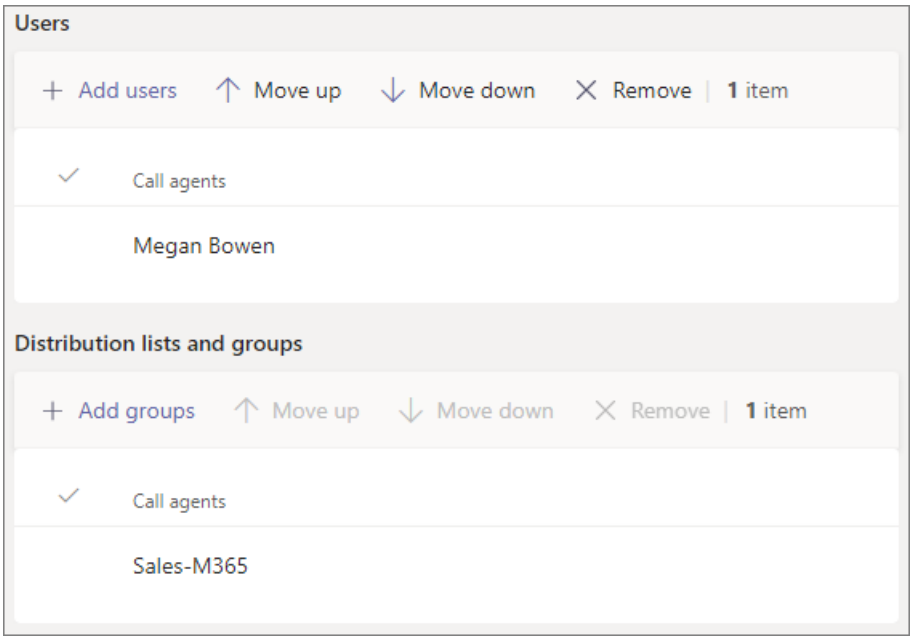
Specify if you want to play a greeting to callers when they arrive in the queue. You must upload an MP3, WAV, or WMA file containing the greeting that you want to play.

Teams provides default music to callers while they are on hold in a queue. If you want to play a specific audio file, choose **Play an audio file** and upload an MP3, WAV, or WMA file.

> **NOTE**
> The uploaded recording can be no larger than 5 MB. The default music supplied in Teams call queues is free of any royalties payable by your organization.

Call agents

Please refer to the Prerequisites in order to be able to add agents to a call queue.



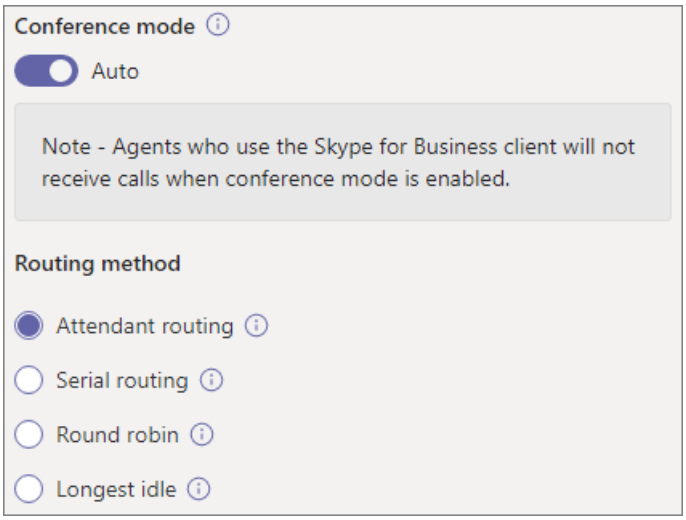
You can add up to 20 agents individually and up to 200 agents via groups.

To add a user to the queue, click **Add users**, search for the user, click **Add**, and then click **Add**.

To add a group to the queue, click **Add groups**, search for the group, click **Add**, and then click **Add**. You can use distribution lists, security groups, and Microsoft 365 groups or Microsoft Teams teams.

> **NOTE**
> New users added to a group can take up to eight hours for their first call to arrive.

Call routing



Conference mode significantly reduces the amount of time it takes for a caller to be connected to an agent, after the agent accepts the call. For conference mode to work, agents in the call queue must use one of the following clients:

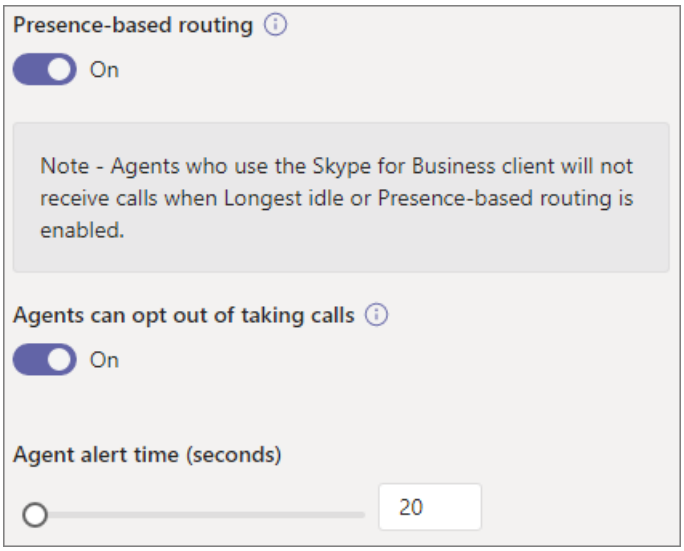
- The latest version of the Microsoft Teams desktop client, Android app, or iOS app
- Microsoft Teams phone version 1449/1.0.94.2020051601 or later

Agents' Teams accounts need to be set to Teams-only mode. Agents who don't meet the requirements aren't included in the call routing list. We recommend enabling conference mode for your call queues if your agents are all using compatible clients.

> **NOTE**
> Busy on Busy is not supported by conference mode. Agents on non-call queue calls may still be presented with a call queue call if presence-based routing is not enabled.

Routing method determines the order in which agents receive calls from the queue. Choose from these options:

- **Attendant routing** rings all agents in the queue at the same time. The first call agent to pick up the call gets the call.
- **Serial routing** rings all call agents one by one in the order specified in the **Call agents** list. If an agent dismisses or does not pick up a call, the call will ring the next agent and will try all agents until it is picked up or times out.
- **Round robin** balances the routing of incoming calls so that each call agent gets the same number of calls from the queue. This may be desirable in an inbound sales environment to assure equal opportunity among all the call agents.
- **Longest idle** routes each call to the agent who has been idle the longest time. An agent is considered idle if their presence state is Available or if their presence state has been Away for less than 10 minutes. Agents whose presence state has been Away for more than 10 minutes are not considered idle and will not be eligible to receive calls until they change their presence to Available.



Presence-based routing uses the availability status of call agents to determine whether an agent should be included in the call routing list for the selected routing method. Call agents whose availability status is set to **Available** are included in the call routing list and can receive calls. Agents whose availability status is set to any other status are excluded from the call routing list and won't receive calls until their availability status changes back to **Available**.

You can enable presence-based call routing with any of the routing methods.

If an agent opts out of getting calls, they won't be included in the call routing list regardless of what their availability status is set to.

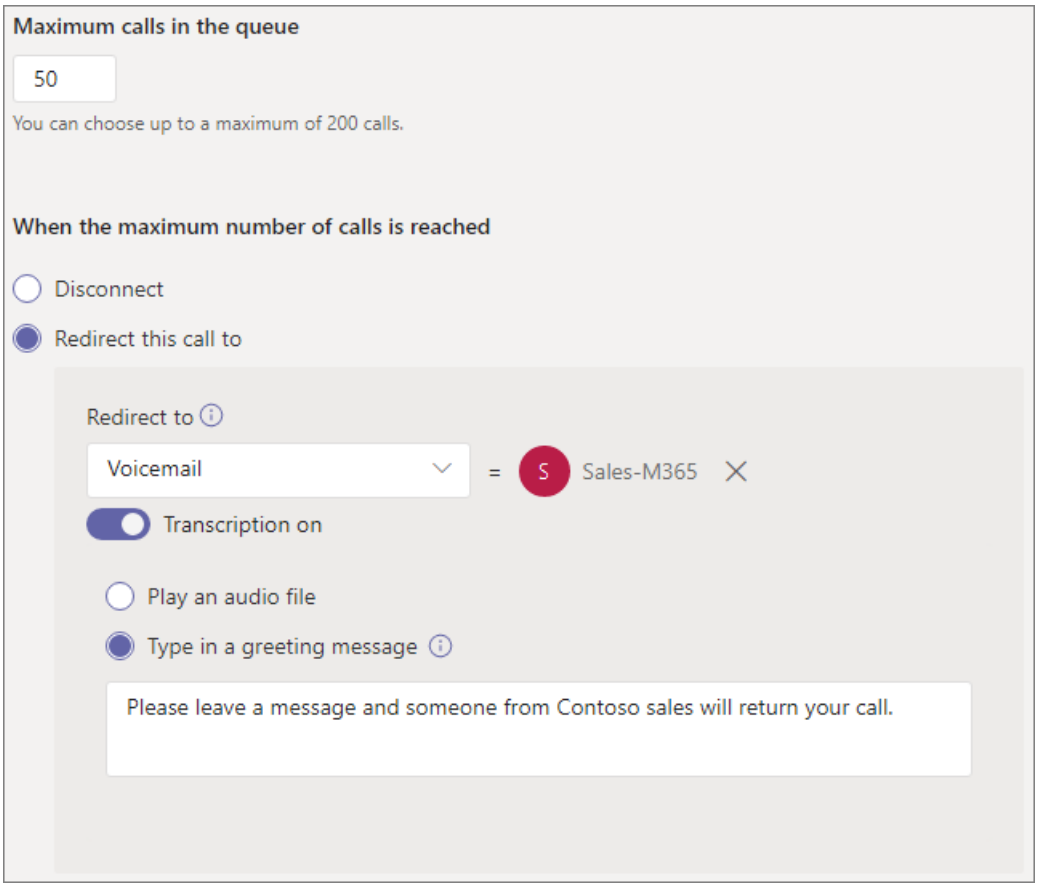
> **NOTE**
> Agents who use the Skype for Business client aren't included in the call routing list when presence-based routing is enabled. If you have agents who use Skype for Business, don't enable presence-based call routing.

Agent alert time specifies how long an agent's phone will ring before the queue redirects the call to the next agent.

For high volume queues, we recommend the following settings:

- **Conference mode** to **Auto**
- **Routing method** to **Attendant routing**
- **Presence-based routing** to **On**
- **Agent alert time:** to **20 seconds**

Call overflow handling

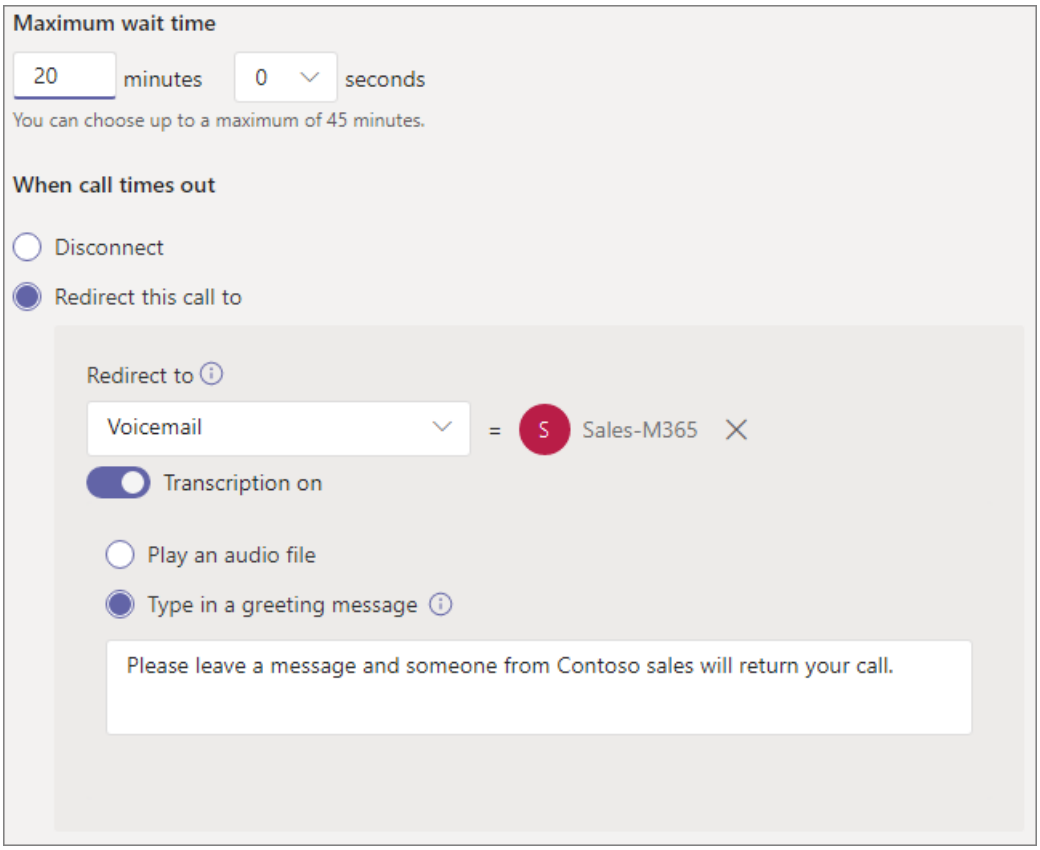


Maximum calls in the queue specifies the maximum number of calls that can wait in the queue at any given time. The default is 50, but it can range from 0 to 200. When this limit is reached, the call is handled as specified by the **When the maximum number of calls is reached** setting.

You can choose to disconnect the call or redirect it to any of the call routing destinations. For example, you might have the caller leave a voicemail for the agents in the queue. For external transfers, please refer to Prerequisites and the external phone number transfers - technical details for number formatting.

> **NOTE**
> If the maximum number of calls is set to 0 then the greeting message will not play.

Call timeout handling



Call Timeout: maximum wait time specifies the maximum time a call can be on hold in the queue before it is redirected or disconnected. You can specify a value from 0 seconds to 45 minutes.

You can choose to disconnect the call or redirect it to one of the call routing destinations. For example, you might have the caller leave a voicemail for the agents in the queue. For external transfers, please refer to Prerequisites and the external phone number transfers - technical details for number formatting.

When you have selected your call timeout options, click **Save**.

Caller ID for outbound calls

Since agents in a call queue may dial out to return a customer call, consider setting the caller ID for members of a call queue to the service number of an appropriate auto attendant. See Manage caller ID policies in Microsoft Teams for more information.

Supported clients

The following clients are supported for call agents in a call queue:

- Skype for Business desktop client 2016 (32-bit and 64-bit versions)
- Lync desktop client 2013 (32-bit and 64-bit versions)
- All IP phone models supported for Microsoft Teams. See Getting phones for Skype for Business Online.
- Mac Skype for Business Client (version 16.8.196 and later)
- Android Skype for Business Client (version 6.16.0.9 and later)
- iPhone Skype for Business Client (version 6.16.0 and later)
- iPad Skype for Business Client (version 6.16.0 and later)
- Microsoft Teams Windows client (32-bit and 64-bit versions)

- Microsoft Teams Mac client
- Microsoft Teams iPhone app
- Microsoft Teams Android app

> **NOTE**
> Call queues that are assigned a direct routing number don't support Skype for Business clients, Lync clients, or Skype for Business IP Phones as agents.

Call queue cmdlets

You can also use Windows PowerShell to create and set up call queues. Here are the cmdlets that you use to manage a call queue.

- New-CsCallQueue
- Set-CsCallQueue
- Get-CsCallQueue
- Remove-CsCallQueue

Related topics

Here's what you get with Phone System

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

New-CsOnlineApplicationInstance

An introduction to Windows PowerShell and Skype for Business Online

Manage resource accounts in Microsoft Teams

12/5/2020 • 5 minutes to read • Edit Online

A resource account is a disabled user object in Azure AD, and can be used to represent resources in general. For example, a resource account may be used in Exchange to represent conference rooms and allow them to have a phone number and calendar. A resource account can be homed in Microsoft 365 or on premises using Skype for Business Server 2019.

In Microsoft Teams, a resource account is required for each auto attendant or call queue. Resource accounts may also be assigned service telephone numbers. This is how you assign phone numbers to auto attendants and call queues allowing callers from outside Teams to reach the auto attendant or call queue.

This article covers how to create resource accounts and ready them for use with auto attendants and call queues.

Before you start the procedures in this article, ensure you've done the following:

- Obtain virtual user licenses
- Obtain service numbers

Obtain virtual user licenses

Each resource account requires a license in order to work with auto attendants and call queues. You can use a free *Microsoft 365 Phone System - Virtual User* license. To obtain these licenses, see Virtual User license.

We cover how to assign the license to a resource account later in this article.

To get the Virtual User license, in the Microsoft 365 admin center, go to **Billing** > **Purchase services** > **Add-on subscriptions** and scroll to the end - you will see *Phone System - Virtual User* license. Select **Buy now**. There is a zero cost, but you still need to follow these steps to acquire the license.

Obtain service numbers

Service numbers are optional for auto attendants and call queues, however you will need at least one service number in order for callers to reach your auto attendant and call queue configuration. For any auto attendant or call queue that you want to be reachable directly by a service number, you must have a resource account with an associated service number.

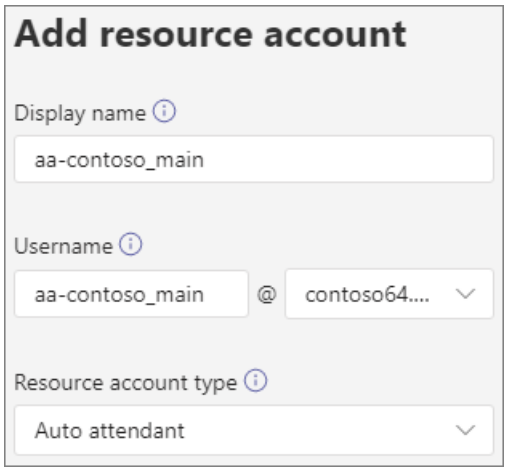
Resource accounts can use either toll or toll-free service numbers. You can request new numbers or port existing numbers from another carrier.

To get new service numbers, see Getting service phone numbers.

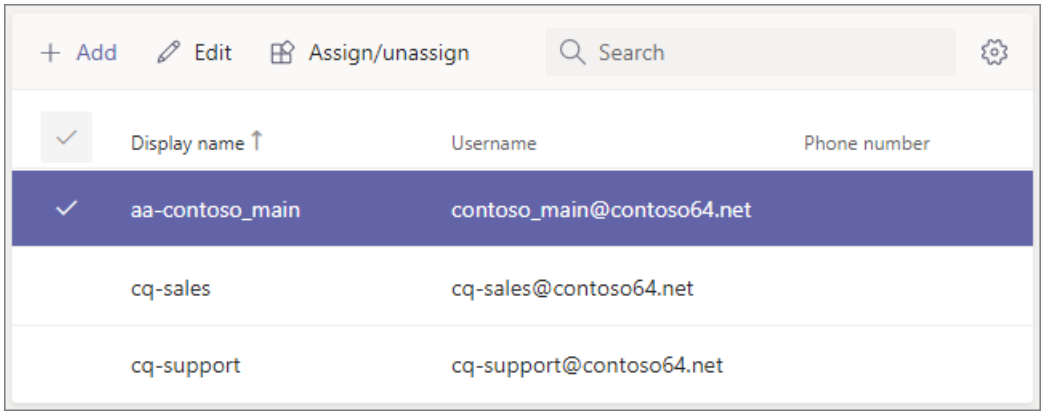
To port a number from another carrier, see Transfer phone numbers to Teams.

Create a resource account

You can create a resource account in the Teams admin center.

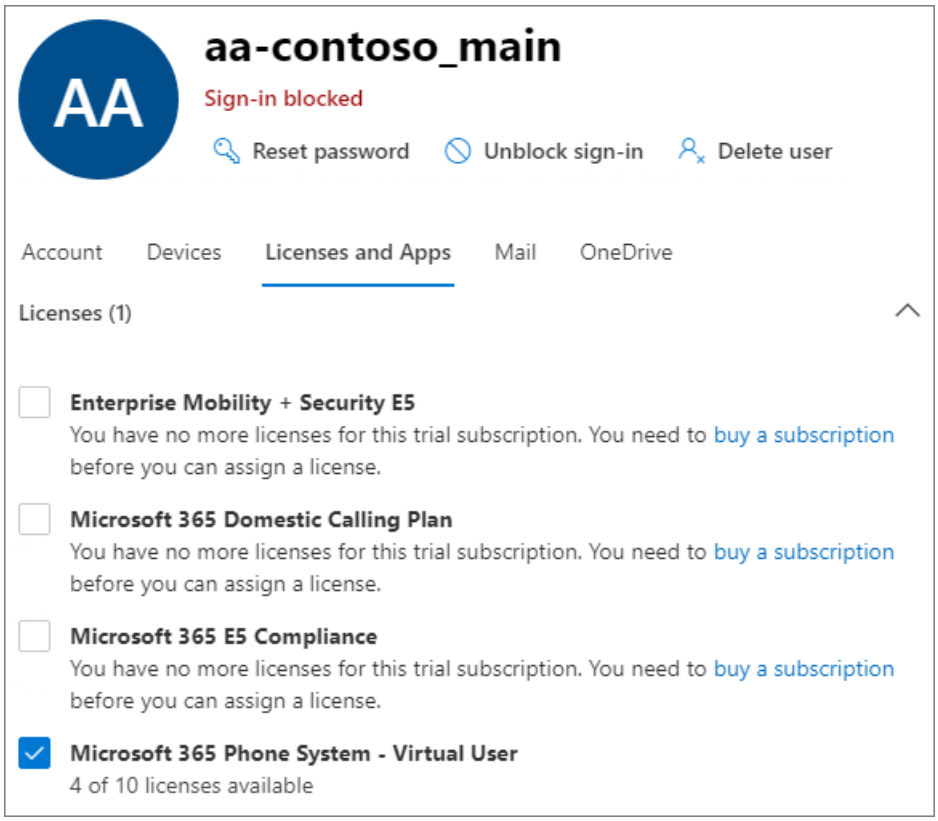


1. In the Teams admin center, expand **Org-wide settings**, and then click **Resource accounts**.
2. Click **Add**.
3. In the **Add resource account** pane, fill out **Display name**, **Username**, and the **Resource account type**. The resource account type can be either **Auto attendant** or **Call queue**, depending how you intend to use this resource account.
4. Click **Save**.



Assign a license

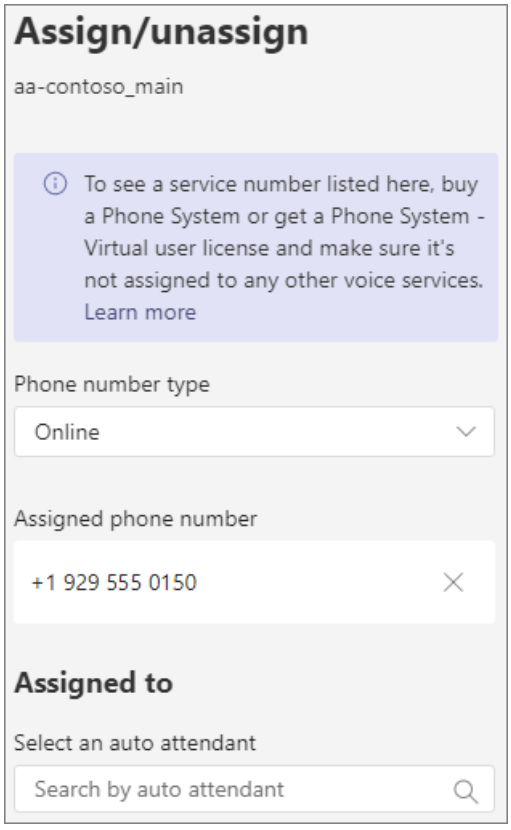
For each resource account, you must assign a *Microsoft 365 Phone System - Virtual User* license or *Phone System* license.



1. In the Microsoft 365 admin center, click the resource account to which you want to assign a license.
2. On the **Licenses and Apps** tab, under **Licenses**, select **Microsoft 365 Phone System - Virtual User**.
3. Click **Save changes**.

Assign a service number

If you're planning to use the resource account with an auto attendant or call queue that requires a service number, assign a number to the resource account.



1. In the Teams admin center, on the **Resource accounts** page, select the resource account to which you want to assign a service number, and then click **Assign/unassign**.
2. In the **Phone number type** dropdown, choose the type of number that you want to use.
3. In the **Assigned phone number** box, search for the number you want to use and click **Add**.
4. Click **Save**.

To assign a direct routing or hybrid number to a resource account you need to use PowerShell:

```
Set-CsOnlineApplicationInstance -Identity aa-contoso_main@contoso64.net -OnpremPhoneNumber +19295550150
```

Next steps

Once you've completed the resource account setup and assigning a service number if needed, you're ready to use the resource account with an auto attendant or call queue.

See the following references:

- Cloud auto attendant
- Cloud call queue

You can edit the resource account **Display name** and **Resource account** type using the **Edit** option. Click **Save** when you are done.

Change an existing resource account to use a Virtual User license

If you decide to switch the licenses on your existing resource account from a **Phone System** license to a Virtual User license, you'll need to acquire the free Virtual User license, and then follow the steps in the Microsoft 365 admin center to Move users to a different subscription.

> **WARNING**
> Always remove a full Phone System License and assign the Virtual User license in the same license activity. If you remove the old license, save the account changes, add the new license, and then save the account settings again, the resource account may no longer function as expected. If this happens, we recommend you create a new resource account for the Virtual User license and remove the broken resource account.

Skype For Business Server 2019

For resource accounts homed on Skype For Business Server 2019 that can be used with cloud call queues and cloud auto attendants, see Plan Cloud call queues or Plan Cloud auto attendants. Hybrid implementations (numbers homed on Direct Routing) are configured using the New-CsHybridApplicationEndpoint cmdlet on an on-premises Skype for Business Server 2019 server.

The application IDs that you need to use while creating the application instances are:

- **Auto Attendant:** ce933385-9390-45d1-9512-c8d228074e07
- **Call Queue:** 11cd3e2e-fccb-42ad-ad00-878b93575e07

> **NOTE**
>
> If you want the call queue or auto attendant to be searchable by Skype For Business Server 2019 users, you should create your resource accounts on Skype For Business Server 2019, since online resource accounts are not synced down to Active Directory. When DNS SRV records for sipfederationtls resolve to Skype for Business Server 2019, then resource accounts **must** be created on Skype For Business Server 2019 using SfB Management shell and synchronized to Azure AD.

For implementations that are hybrid with Skype for Business Server:

Plan Cloud auto attendants

Plan Cloud call queues

Configure on-prem resource accounts

Delete a resource account

Make sure you dissociate the telephone number from the resource account before deleting it, to avoid getting your service number stuck in pending mode.

After you do that, you can delete the resource account in the Microsoft 365 admin center, under the Users tab.

To disassociate a direct routing telephone number from the resource account, use the following cmdlet:

```
Set-CsOnlineApplicationInstance -Identity  <Resource Account oid> -OnpremPhoneNumber ""
```

Set up holidays in Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

You can use the Teams Holidays feature to provide alternate messages and routing to callers for specific dates and times when departments, call queues or people in your organization will be following different working hours or won't be available. For example, you might create a holiday for New Year's day when your organization may be closed.

The holidays you create here are available when you set up an auto attendant, each with its own greeting and call routing settings.

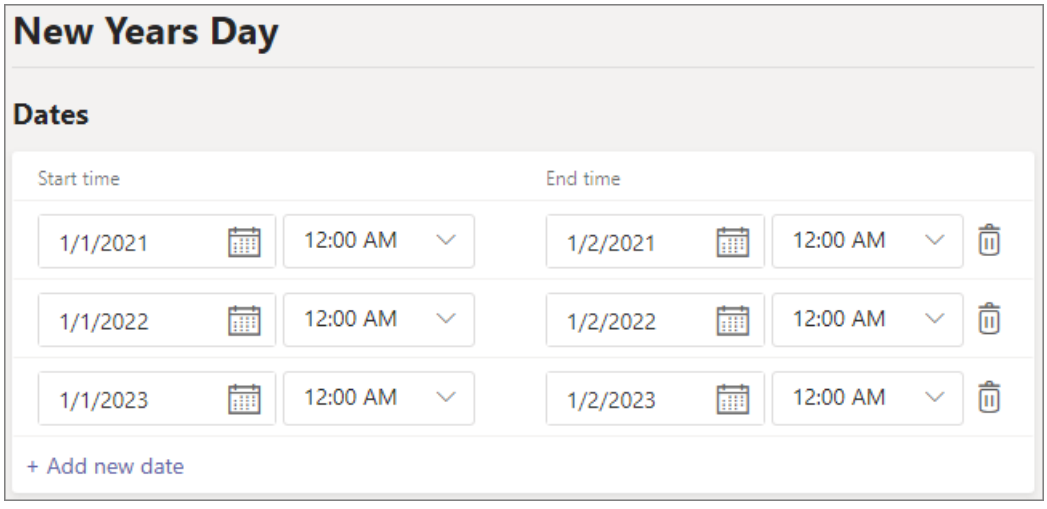
Create a holiday

To create a holiday

1. In the Microsoft Teams admin center, go to **Org-wide settings** > **Holidays**.
2. Select **New holiday**.
3. Enter a name for the holiday.
4. Select **Add new date**.
5. Under **Start time**, select the calendar icon and choose the date when you'd like the holiday to begin.
6. Use the drop-down list to select a start time for the holiday.
7. Under **End time**, select the calendar icon and choose the date when you'd like the holiday to end.
8. Use the drop-down list to select an end time for the holiday. The **End time** must be after the **Start time**.

> **NOTE**
> If the holiday is for one full day (i.e., a 24 hour period), the **End time** should be set to the next day and the time to 12:00 AM. For example, if your organization is closed on January 1 for New Year's day, set the **Start time** to January 1 12:00 AM and set the **End time** to January 2 @ 12:00 AM.

9. Optionally, add more dates for recurring holidays.
10. Select **Save**.



Change a holiday

To change a holiday

1. In the Microsoft Teams admin center, go to **Org-wide settings** > **Holidays**.
2. Select the holiday from the list.
3. Under **Start time**, select the calendar icon and choose the date when you'd like the holiday to begin.
4. Use the drop-down list to select a start time for the holiday.
5. Under **End time**, select the calendar icon and choose the date when you'd like the holiday to end.
6. Use the drop-down list to select an end time for the holiday. The **End time** must be after the **Start time**.
7. Select **Save**.

Related topics

Plan for Teams auto attendants and call queues?

Answer auto attendant and call queue calls directly from Teams

9/14/2020 • 2 minutes to read • Edit Online

Teams users can receive and answer calls from Cloud auto attendants and call queues directly from their Teams client.

What are auto attendants and call queues?

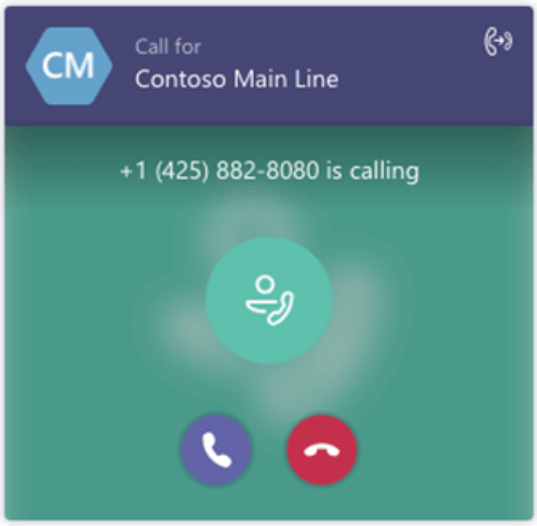
Cloud auto attendants provide a series of voice prompts or an audio file that callers hear instead of a human operator when they call in to an organization. An auto attendant lets callers move through the menu system, place calls, or locate users by using a phone keypad (DTMF) or voice inputs using speech recognition.

Cloud call queues include greetings that are used when someone calls in to a phone number for your organization, the ability to automatically put the calls on hold, and the ability to search for the next available call agent to handle the call while the people who call are listening to music on hold. You can create single or multiple call queues for your organization.

Handling an auto attendant or call queue call

Users will be able to differentiate incoming calls from an auto attendant or call queue before they answer the call. Along with the name and/or number of the caller, each call will include information about who the caller was trying to reach, giving users a better context for addressing the caller.

The following illustration shows how an incoming call from an auto attendant or call queue will appear to a user.



Once an auto attendant or call queue call is answered, the user can process the call like any other call — they can add or conference in another user or transfer the call to another party. Also, auto attendant calls will be forwarded based on the user's configuration.

> **NOTE**
> Call queue calls are not forwarded based on the user's configuration. This is to ensure callers remain in the queue until an agent can answer the call and the caller isn't forwarded unexpectedly.

Supported clients

Support for auto attendant and call queue calls is available in the following clients:

- Microsoft Teams Windows client (32 and 64-bit versions)
- Microsoft Teams Mac client
- Microsoft Teams iPhone app
- Microsoft Teams Android app

Configure auto attendant and call queue support for Microsoft Teams

To receive auto attendant and call queue calls on Microsoft Teams, you need to configure your interoperability policy and upgrade policy. Please review Migration and interoperability for organizations using Teams together with Skype for Business. If you do not have auto attendant and/or call queue configured and would like to do so, see Set up a Cloud auto attendant and Create a Cloud call queue.

Known Issues

When a call queue agents receives a call on their mobile device, calls may go on hold if the device is locked. User must unlock device first and then answer the call.

Related topics

- What is Phone System in Microsoft 365 or Office 365
- Create a Cloud call queue
- What are Cloud auto attendants?
- Set up a Cloud auto attendant

Auto Attendant & Call Queue Historical Report

12/5/2020 • 7 minutes to read • Edit Online

The CQD Teams Auto Attendant & Call Queue Historical Report Power BI Template provides the following three reports:

- Auto Attendant – showing analytics for calls coming into your Auto Attendants.
- Call Queue – showing analytics for calls coming into your Call Queues.
- Agent Timeline – showing a timeline view of agents being active in Call Queue calls.

These reports use data from the Call Quality Dashboard data store and allow organizations to report on the number of calls being processed by auto attendants and call queues as well agent performance in the call queues.

What are the requirements?

You need to have Power BI Desktop installed. You can install it from the Microsoft Windows Store.

You can use the free version of Power BI Desktop. The minimum compatible version is 2.85.681.0 (September 2020).

Permissions to access the CQD pipeline

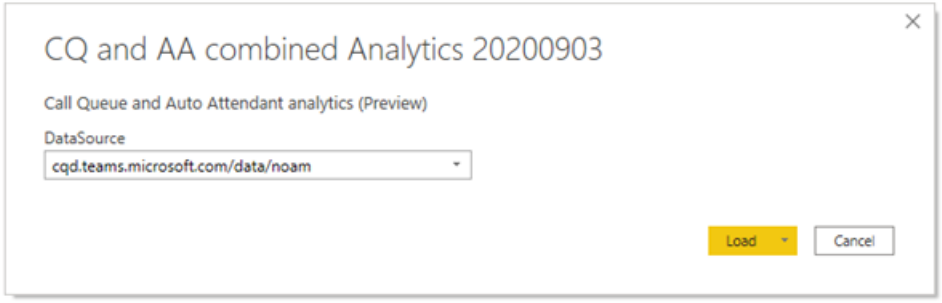
The account you use to view the AA & CQ Analytics historical report needs to have permissions to access the CQD data pipeline. Please refer to the CQD access role for more information.

Installation

The following steps assume you have already installed Power BI Desktop on the computer and that your account has the necessary permissions to access the CQD data pipeline.

Please perform these steps:

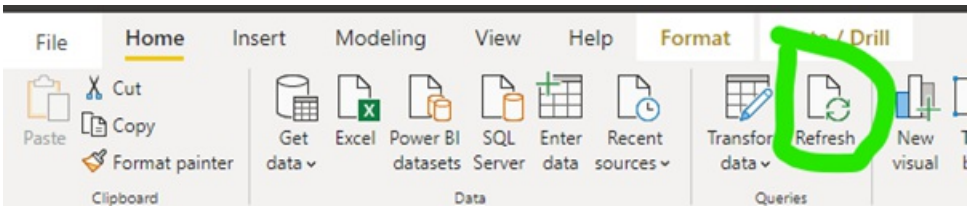
- Download the CQD Power BI Query Templates and save the zip file to a directory on your computer.
- Double-click on the zip file to open it.
- Double-click on the "CQ and AA combined Analytics 20201105.pbit" template file and Power BI Desktop should launch.
- You will be prompted to select the CQD data pipeline region. Select the region where your tenant is located.



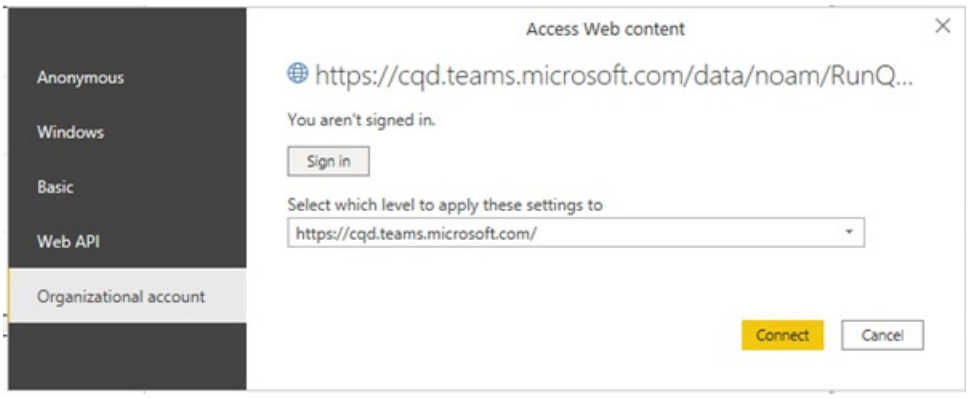
- You can see the region using the Skype for Business Online PowerShell cmdlet (Get-CsTenant).ServiceInstance output. The region will be displayed after the / like in this example:

microsoftcommunicationsonline/noam-4a-s7 where the region is noam.

- The report will launch with sample data.
- To see your own data, please click **Refresh** in the Home tab under Queries in Power BI Desktop.



- You will then be prompted to sign in. Select **Organization account** and then select **Sign in**.



- Select **Connect** and watch the data refresh.

Data latency and AA & CQ analytics

Data will be available in the CQD data pipeline within 30 minutes.

You will have to refresh the data to see the new analytics data.

Customization

You are able to customize certain visualization aspects of the reports, such as adding or removing fields to be shown in the various visualizations, changing chart type, etc.

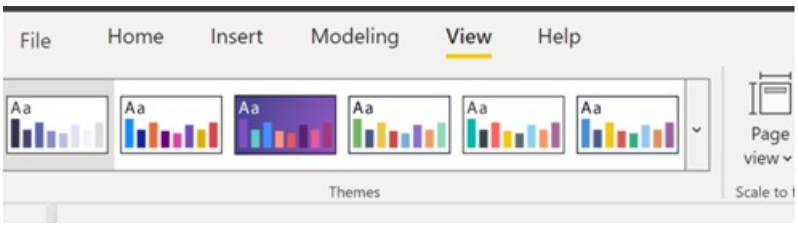
You cannot add additional data fields other than the ones provided in the report.

Change color schema

The following steps assume you have already completed the Installation steps.

Please perform these steps:

- Select **View tab** on the ribbon.



- Select the color schema from the drop-down list.



CQD fields description

NAME	DATA TYPE	DESCRIPTION
Auto Attendant Identity	string	Name of resource account attached to AA Example: aa_test@microsoft.com
Auto Attendant Chain Start Time	datetime	AA chain start time
Auto Attendant Directory Search Method	string	Last Address book search method
Auto Attendant Transfer Action	string	Call transfer target type possible values: § unknown - entity type was not specified § user - user entity § orgaa - Organizational Auto Attendant entity § hunt_group - Call Queue entity § application - voice application entity § external_pstn - external PSTN entity § shared_voicemail - shared voicemail entity
Auto Attendant Call Result	string	Call result: § unknown § transferred_to_user § transferred_to_operator § failover_to_operator § user_terminated § service_declined § service_terminated § failed_to_establish_media § terminated_no_operator § terminated_transfer_failed § terminated_automatic_selection § transferred_to_shared_voicemail § oaa_chain_too_long § oaa_session_too_long

NAME	DATA TYPE	DESCRIPTION
Auto Attendant Call Flow	string	Encapsulates the different states of Auto Attendant Call § abs_search § call_termination § call_transfer § main_menu § user_selection § speech_input_confirmation § first_level_menu § automatic_menu § announcement
Is Auto Attendant Involved	Boolean	Indicated if AA involved into the call
Auto Attendant Caller Action Count	int	Count of used action by caller
Auto Attendant Chain Duration Seconds	int	Duration of call in AA
Call Queue Call Result	String	Call queue call final state possible values: § error § declined § overflown § failed § timed_out § transferred_to_agent § agent_joined_conference
Call Queue Final State Action	String	Call queue final action possible values: § forward § disconnect § voicemail § disconnect_with_busy § shared_voicemail § failed_to_accept_call § other
Call Queue Identity	String	Name of resource account attached to CQ Example: aa_test@microsoft.com
Call Queue Is Conference Mode	Boolean	Set to 1 if conference mode enabled on CQ
Call Queue Target Type	String	Expected call redirection target type
Transferred From Call Queue Identity	Boolean	Name of resource account attached to CQ from which this call was transferred Example: aa_test@microsoft.com
Call Queue Agent Opt In Count	int	Count of agents available to this queue at the moment of call

NAME	DATA TYPE	DESCRIPTION
Call Queue Agent Count	int	Count of agents assigned to this queue at the moment of call
Is Call Queue Involved	Boolean	If call queue is involved into to this call equal 1

Power BI data model dimensions

NAME	DATA TYPE	DESCRIPTION
AA Name	string	Auto Attendant ID (resource account ID)
AACallFlow	string	Encapsulates the different states of Auto Attendant Call § abs_search § call_termination § call_transfer § main_menu § user_selection § speech_input_confirmation § first_level_menu § automatic_menu § announcement
AACallResult	string	Result of Auto Attendant Call: § unknown § transferred_to_user § transferred_to_operator § failover_to_operator § user_terminated § service_declined – error of AA configuration § service_terminated – internal AA errors § failed_to_establish_media § terminated_no_operator § terminated_transfer_failed § terminated_automatic_selection § transferred_to_shared_voicemail § oaa_chain_too_long § oaa_session_too_long
AAChainDuration	string	Duration of Auto Attendant call in seconds
AACount	string	# of Auto Attendant involve in call
AADirectorySearchMethod	string	Search method used in call: § abs_search_dtmf § abs_search_extension § abs_search_name
AAStartTime	string	Call time in UTC

NAME	DATA TYPE	DESCRIPTION
AATransferAction	string	Receiver of call: § unknown - entity type was not specified § user - user entity § AA - Organizational Auto Attendant entity § CQ - Call Queue entity § application - voice application entity § external_pstn - external PSTN entity § shared_voicemail - shared voicemail entity
PSTNMinutes	int	Total minute usage
Call Queue Call Result	string	Call queue call final state possible values: § error § declined § overflown § failed § timed_out § transferred_to_agent § agent_joined_conference
Call Queue Identity	string	Name of resource account attached to CQ
Call Queue Target Type	string	Expected call redirection target type: § User § Application Endpoint § Other
Call Queue Call Result	string	Call queue call final state possible values: § error § declined § overflown § failed § timed_out § transferred_to_agent § agent_joined_conference
Call Queue Final State Action	string	Call queue final action possible values: § forward § disconnect § voicemail § disconnect_with_busy § shared_voicemail § failed_to_accept_call § other
Agent Name	string	User UPN

Measures

NAME	TYPE	DESCRIPTION
AACallerActionCount	int	# of action selected by user in AA during the call
PSTNMinutes	int	Total minute usage
TotalCallCount	int	# of calls
Average Call Duration(Seconds)	int	Total duration of call queue calls in seconds

Power BI graph description Auto Attendant

NAME	DESCRIPTION
Incoming call source	Distribution of call by Internal/ External call source
Directory search method totals	Distribution of call by search type
Caller action	Distribution of call by call receiver
Call result	Distribution of call by final call state
Caller action count	Distribution of call by number action used during the call

Call Queue

NAME	DESCRIPTION
Incoming call source	Distribution of call by Internal/ External call source
Call volume	Distribution of call by call queues
Caller result	Distribution of call by call result
Timeout/Overflow call total action	Distribution of NOT forwarded(abandoned) call by call result
Transfer/Forward target totals	Distribution of call forwarded by call result
Abandoned calls ratio	Ratio of successful to abandoned call count
Average session length (seconds)	Call length in seconds grouped by abandoned/successful calls

Agent timeline

NAME	DESCRIPTION
# calls by agent	Distribution of call by call queue and agent
Total call duration (seconds) by agent and Call Queue	Total duration (seconds) of call by agent and call queue
Average call duration (seconds) by agent name	Average duration (seconds) of call by agent

Known Issues

- Currently, Call Queue and auto attendant show resource account's ID instead of Call Queue/auto attendant names. To show all the traffic for an auto attendant or Call Queue you must select all the resource accounts assigned to the auto attendant or Call Queue.
- Currently, only 28 days of history is available in the dashboard as Call Queue/auto attendant data is considered end user identifiable information and is subject to data privacy retention policies.

Auto attendant and call queue dialing and voice recognition reference

12/5/2020 • 6 minutes to read • Edit Online

Dial by Name is a feature of an auto attendant that is also known as directory search. It enables the people who call your auto attendant to use voice (speech recognition) or their phone keypad (DTMF) responses to enter a full or partial name to search company's directory, locate the person, and then have the call transferred to them. You set up dial by name when you configure the call flow settings in an auto attendant.

Searching for users

Users you wish to have located and reached using Dial by Name **aren't required to have a phone number or have Calling Plans assigned to them, but they must have a Phone System license if they are online users, or Enterprise Voice enabled for Skype for Business Server users**. Dial by Name will even be able to find and transfer calls to Microsoft Teams users who are hosted in different countries or regions for multi-national organizations. Given the prerequisites involved, you explicitly enable Dial by Name in an auto attendant.

Dial by extension is a feature of an auto attendant that is also part of directory search. It enables the people who call your auto attendant to use voice (speech recognition) or their phone keypad (DTMF) responses to enter the phone extension of the user they're trying to reach, and then have the call transferred to them. Users you wish to have located and reached using Dial by extension **aren't required to have a phone number or have Calling Plans assigned to them, but they must have a Phone System license if they are online users, or Enterprise Voice enabled for Skype for Business Server users**. You will also need to have an appropriately configured dial plan for your users. Dial by extension will even be able to find and transfer calls to Microsoft Teams users who are hosted in different countries or regions for multi-national organizations. Given the prerequisites involved, you explicitly enable Dial by extension in an auto attendant.

Maximum directory size

There is no limit on the number of Active Directory users Dial by Name and Dial by Extension can support when a caller search for a specific person. A caller can enter partial or full names (FirstName + LastName, and also LastName + FirstName), but needs the full extension number. The maximum name list size that a single auto attendant can support using speech recognition is 80,000 users.

INPUT TYPE	SEARCH FORMAT	MAXIMUM NUMBER OF USERS IN AN ORGANIZATION
DTMF (keypad entry)	Partial FirstName + LastName LastName + FirstName	No limit
Speech (voice input)	FirstName LastName FirstName + LastName LastName + FirstName	80,000 users

NOTE

If you are using Dial by Name with speech recognition, but your organization's Active Directory is larger than 80,000 users and you haven't limited the scope of Dial by Name using Dial Scope feature, Dial by Name will still work for your callers using a phone keypad, and voice inputs will be available for all other scenarios. You can use the Dial Scope feature to narrow down the names that are reachable by changing the scope of Dial by Name for a particular auto attendant.

Dial by Name - Keypad (DTMF) entry

People calling in can use Dial by Name to reach users by specifying either the full or partial name of the person they are trying to reach. There are various formats that can be used when the name is entered.

When searching your organization's directory, people can use the '0' (zero) key to indicate a space between the first name and last or last name and first. When they are entering the name, they will be asked to terminate their keypad entry with the # key. For example, "After you enter the name of the person you are trying to reach, press #." If there are multiple names that are found, the person calling will be given a list of names to select from.

People can search for names in your organization using the following search formats on their phone keypad:

NAME FORMAT	SEARCH TYPE	EXAMPLE	SEARCH RESULT
FirstName + LastName	Full	Amos0Marble#	Amos Marble
LastName + FirstName	Full	Marble0Amos#	Amos Marble
FirstName	Full	Amos#	Press 1 for Amos Marble Press 2 for Amos Marcus
LastName	Full	Marble#	Press 1 for Amos Marble Press 2 for Mary Marble
FirstName or LastName	Partial	Mar#	Press 1 for Mary Marble Press 2 for Mary Jones Press 3 for Amos Marcus
FirsName + LastName	Partial	Amos0Mar#	Press 1 for Amos Marble Press 2 for Amos Marcus
LastName + FirstName	Partial	Mar0Am#	Press 1 for Amos Marble Press 2 for Amos Marcus

There are several special characters that are used when searching for people using a phone keypad. For example, the person will be asked to use the pound key (#), while the zero (0) key is used for a space between names. Pressing the star key (*) will repeat the list of matching names to the person.

SPECIAL PHONE KEYPAD CHARACTER	WHAT IT MEANS
#	End character when entering a name.
0	Space between names.
*	Repeat the list of matching names.

Dial by Name - Name recognition with speech

People can search for others in their organization with their voice (speech recognition). They can also reach anyone in Active Directory by saying the full or partial name of the person they are trying to locate. Using voice inputs can recognize names in various formats, including FirstName, LastName, FirstName + LastName, or LastName + FirstName.

You can enable speech recognition for an auto attendant, but phone keypad entry (DTMF) isn't disabled. Phone keypad entry can be used at any time even if speech recognition is enabled on the auto attendant.

As with phone keypad entry, if multiple names are found, the person calling hears a list of names to select from.

Callers can say names in the following formats:

NAME WITH SPEECH	SEARCH TYPE	EXAMPLE	SEARCH RESULT
FirstName + LastName	Full	Amos Marble	Amos Marble
LastName + FirstName	Full	Marble Amos	Amos Marble
FirstName	Full	Amos	Press or say 1 for Amos Marble Press or say 2 for Amos Jones
LastName	Full	Marble	Press or say 1 for Amos Marble Press or say 2 for Ben Marble
FirstName or LastName	Partial	Mar	Press or say 1 for Mary Marble Press or say 2 for Mary Jones Press or say 3 for Amos Marcus
FirsName + LastName	Partial	Amos Mar	Press or say 1 for Amos Marble Press or say 2 for Amos Marcus

NOTE

It might take up to 36 hours for a new user to have their name listed in the directory for Dial by Name with speech recognition due to Active Directory replication lag.

Language support

The following languages are available for text-to-speech used with outgoing prompts:

-	-	-
Arabic (EG)	English (NZ)	Korean (KO)
Chinese (HK)	English (UK)	Norwegian (NO)
Chinese (TW)	English (US)	Polish (PL)

-	-	-
Chinese (ZH)	Finnish (FI)	Portuguese (BR)
Danish (DA)	French (CA)	Portuguese (PT)
Dutch (NL)	French (FR)	Russian (RU)
English (AU)	German (DE)	Spanish (ES)
English (CA)	Italian (IT)	Spanish (MX)
English (IN)	Japanese (JP)	Swedish (SV)

Speech recognition input for auto attendants is available in the following languages:

-	-
Chinese (ZH)	French (FR)
English (AU)	German (DE)
English (CA)	Italian (IT)
English (IN)	Japanese (JP)
English (UK)	Portuguese (BR)
English (US)	Spanish (ES)
French (CA)	Spanish (MX)

The following voice commands are available in the 14 languages supported for speech recognition:

VOICE COMMAND	CORRESPONDS TO
Yes	Press 1 for Yes.
No	Press 2 for No.
Repeat	Repeats the list of options. Press * on the keypad to repeat the list of options.
Operator	Press 0 for "Operator"
Main Menu	Brings the caller to the main menu of the auto attendant.
Zero	Press 0 (by default, same as "Operator").
One	Press 1.
Two	Press 2.

VOICE COMMAND	CORRESPONDS TO
Three	Press 3.
Four	Press 4.
Five	Press 5.
Six	Press 6.
Seven	Press 7.
Eight	Press 8.
Nine	Press 9.

Related topics

Here's what you get with Phone System

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Small business example - Set up an auto attendant

Auto Attendant & Call Queue Historical Report

12/5/2020 • 7 minutes to read • Edit Online

The CQD Teams Auto Attendant & Call Queue Historical Report Power BI Template provides the following three reports:

- Auto Attendant – showing analytics for calls coming into your Auto Attendants.
- Call Queue – showing analytics for calls coming into your Call Queues.
- Agent Timeline – showing a timeline view of agents being active in Call Queue calls.

These reports use data from the Call Quality Dashboard data store and allow organizations to report on the number of calls being processed by auto attendants and call queues as well agent performance in the call queues.

What are the requirements?

You need to have Power BI Desktop installed. You can install it from the Microsoft Windows Store.

You can use the free version of Power BI Desktop. The minimum compatible version is 2.85.681.0 (September 2020).

Permissions to access the CQD pipeline

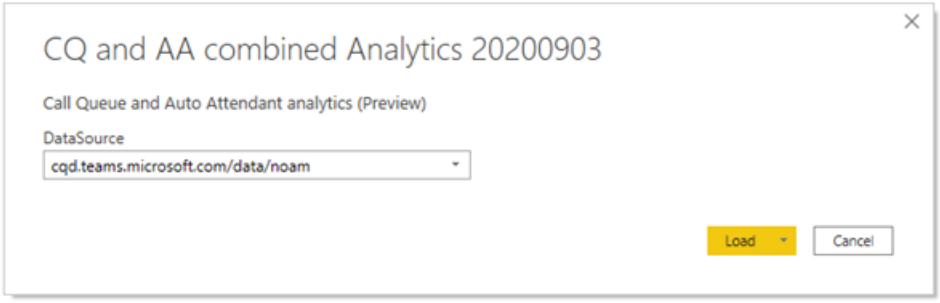
The account you use to view the AA & CQ Analytics historical report needs to have permissions to access the CQD data pipeline. Please refer to the CQD access role for more information.

Installation

The following steps assume you have already installed Power BI Desktop on the computer and that your account has the necessary permissions to access the CQD data pipeline.

Please perform these steps:

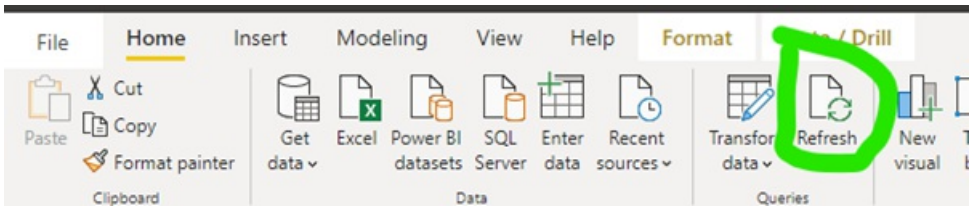
- Download the CQD Power BI Query Templates and save the zip file to a directory on your computer.
- Double-click on the zip file to open it.
- Double-click on the "CQ and AA combined Analytics 20201105.pbit" template file and Power BI Desktop should launch.
- You will be prompted to select the CQD data pipeline region. Select the region where your tenant is located.



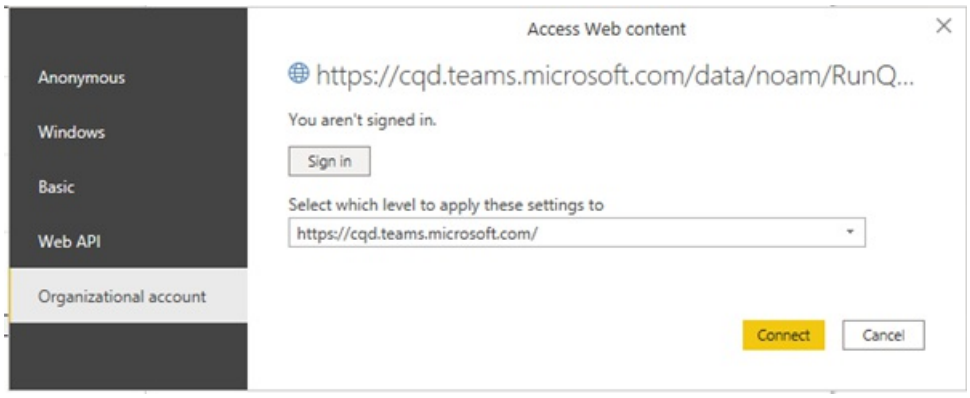
- You can see the region using the Skype for Business Online PowerShell cmdlet (Get-CsTenant).ServiceInstance output. The region will be displayed after the / like in this example:

microsoftcommunicationsonline/noam-4a-s7 where the region is noam.

- The report will launch with sample data.
- To see your own data, please click **Refresh** in the Home tab under Queries in Power BI Desktop.



- You will then be prompted to sign in. Select **Organization account** and then select **Sign in**.



- Select **Connect** and watch the data refresh.

Data latency and AA & CQ analytics

Data will be available in the CQD data pipeline within 30 minutes.

You will have to refresh the data to see the new analytics data.

Customization

You are able to customize certain visualization aspects of the reports, such as adding or removing fields to be shown in the various visualizations, changing chart type, etc.

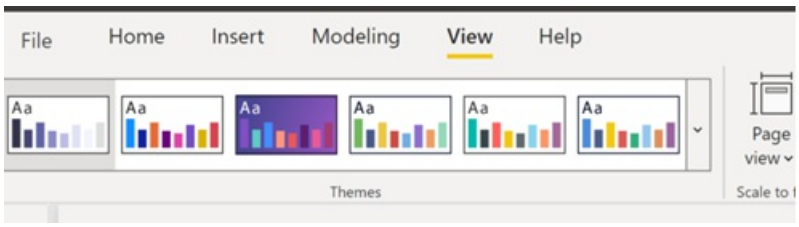
You cannot add additional data fields other than the ones provided in the report.

Change color schema

The following steps assume you have already completed the Installation steps.

Please perform these steps:

- Select **View tab** on the ribbon.



- Select the color schema from the drop-down list.



CQD fields description

NAME	DATA TYPE	DESCRIPTION
Auto Attendant Identity	string	Name of resource account attached to AA Example: aa_test@microsoft.com
Auto Attendant Chain Start Time	datetime	AA chain start time
Auto Attendant Directory Search Method	string	Last Address book search method
Auto Attendant Transfer Action	string	Call transfer target type possible values: § unknown - entity type was not specified § user - user entity § orgaa - Organizational Auto Attendant entity § hunt_group - Call Queue entity § application - voice application entity § external_pstn - external PSTN entity § shared_voicemail - shared voicemail entity
Auto Attendant Call Result	string	Call result: § unknown § transferred_to_user § transferred_to_operator § failover_to_operator § user_terminated § service_declined § service_terminated § failed_to_establish_media § terminated_no_operator § terminated_transfer_failed § terminated_automatic_selection § transferred_to_shared_voicemail § oaa_chain_too_long § oaa_session_too_long

NAME	DATA TYPE	DESCRIPTION
Auto Attendant Call Flow	string	Encapsulates the different states of Auto Attendant Call § abs_search § call_termination § call_transfer § main_menu § user_selection § speech_input_confirmation § first_level_menu § automatic_menu § announcement
Is Auto Attendant Involved	Boolean	Indicated if AA involved into the call
Auto Attendant Caller Action Count	int	Count of used action by caller
Auto Attendant Chain Duration Seconds	int	Duration of call in AA
Call Queue Call Result	String	Call queue call final state possible values: § error § declined § overflown § failed § timed_out § transferred_to_agent § agent_joined_conference
Call Queue Final State Action	String	Call queue final action possible values: § forward § disconnect § voicemail § disconnect_with_busy § shared_voicemail § failed_to_accept_call § other
Call Queue Identity	String	Name of resource account attached to CQ Example: aa_test@microsoft.com
Call Queue Is Conference Mode	Boolean	Set to 1 if conference mode enabled on CQ
Call Queue Target Type	String	Expected call redirection target type
Transferred From Call Queue Identity	Boolean	Name of resource account attached to CQ from which this call was transferred Example: aa_test@microsoft.com
Call Queue Agent Opt In Count	int	Count of agents available to this queue at the moment of call

NAME	DATA TYPE	DESCRIPTION
Call Queue Agent Count	int	Count of agents assigned to this queue at the moment of call
Is Call Queue Involved	Boolean	If call queue is involved into to this call equal 1

Power BI data model dimensions

NAME	DATA TYPE	DESCRIPTION
AA Name	string	Auto Attendant ID (resource account ID)
AACallFlow	string	Encapsulates the different states of Auto Attendant Call § abs_search § call_termination § call_transfer § main_menu § user_selection § speech_input_confirmation § first_level_menu § automatic_menu § announcement
AACallResult	string	Result of Auto Attendant Call: § unknown § transferred_to_user § transferred_to_operator § failover_to_operator § user_terminated § service_declined – error of AA configuration § service_terminated – internal AA errors § failed_to_establish_media § terminated_no_operator § terminated_transfer_failed § terminated_automatic_selection § transferred_to_shared_voicemail § oaa_chain_too_long § oaa_session_too_long
AAChainDuration	string	Duration of Auto Attendant call in seconds
AACount	string	# of Auto Attendant involve in call
AADirectorySearchMethod	string	Search method used in call: § abs_search_dtmf § abs_search_extension § abs_search_name
AAStartTime	string	Call time in UTC

NAME	DATA TYPE	DESCRIPTION
AATransferAction	string	Receiver of call: § unknown - entity type was not specified § user - user entity § AA - Organizational Auto Attendant entity § CQ - Call Queue entity § application - voice application entity § external_pstn - external PSTN entity § shared_voicemail - shared voicemail entity
PSTNMinutes	int	Total minute usage
Call Queue Call Result	string	Call queue call final state possible values: § error § declined § overflown § failed § timed_out § transferred_to_agent § agent_joined_conference
Call Queue Identity	string	Name of resource account attached to CQ
Call Queue Target Type	string	Expected call redirection target type: § User § Application Endpoint § Other
Call Queue Call Result	string	Call queue call final state possible values: § error § declined § overflown § failed § timed_out § transferred_to_agent § agent_joined_conference
Call Queue Final State Action	string	Call queue final action possible values: § forward § disconnect § voicemail § disconnect_with_busy § shared_voicemail § failed_to_accept_call § other
Agent Name	string	User UPN

Measures

NAME	TYPE	DESCRIPTION
AACallerActionCount	int	# of action selected by user in AA during the call
PSTNMinutes	int	Total minute usage
TotalCallCount	int	# of calls
Average Call Duration(Seconds)	int	Total duration of call queue calls in seconds

Power BI graph description Auto Attendant

NAME	DESCRIPTION
Incoming call source	Distribution of call by Internal/ External call source
Directory search method totals	Distribution of call by search type
Caller action	Distribution of call by call receiver
Call result	Distribution of call by final call state
Caller action count	Distribution of call by number action used during the call

Call Queue

NAME	DESCRIPTION
Incoming call source	Distribution of call by Internal/ External call source
Call volume	Distribution of call by call queues
Caller result	Distribution of call by call result
Timeout/Overflow call total action	Distribution of NOT forwarded(abandoned) call by call result
Transfer/Forward target totals	Distribution of call forwarded by call result
Abandoned calls ratio	Ratio of successful to abandoned call count
Average session length (seconds)	Call length in seconds grouped by abandoned/successful calls

Agent timeline

NAME	DESCRIPTION
# calls by agent	Distribution of call by call queue and agent
Total call duration (seconds) by agent and Call Queue	Total duration (seconds) of call by agent and call queue
Average call duration (seconds) by agent name	Average duration (seconds) of call by agent

Known Issues

- Currently, Call Queue and auto attendant show resource account's ID instead of Call Queue/auto attendant names. To show all the traffic for an auto attendant or Call Queue you must select all the resource accounts assigned to the auto attendant or Call Queue.
- Currently, only 28 days of history is available in the dashboard as Call Queue/auto attendant data is considered end user identifiable information and is subject to data privacy retention policies.

Block inbound calls

7/9/2020 • 5 minutes to read • Edit Online

Phone System Direct Routing and Calling Plans support blocking inbound calls from the Public Switched Telephone Network (PSTN). This feature allows a tenant global list of number patterns to be defined so that the caller ID of every incoming PSTN call to the tenant can be checked against the list for a match. If a match is made, an incoming call is rejected.

This inbound call blocking feature only works on inbound calls that originate from the PSTN and only works on a tenant-global basis. It's not available on a per-user basis.

> **NOTE**
> Blocked callers may experience slightly different behaviors when they've been blocked. The behavior is based on how the blocked caller's carrier handles the notification that the call isn't allowed to be successfully completed. Examples may include a carrier message stating the call can't be completed as dialed, or simply dropping the call.

Call blocking admin controls and information

Admin controls for blocking numbers are provided using PowerShell only. Number block patterns are defined as regular expression patterns. The order of the expressions is unimportant – the first pattern matched in the list results in the call being blocked. A new number or pattern that's added or removed in the blocked callers list may take up to 24 hours for the pattern to become active.

Call blocking PowerShell commands

You manage number patterns by using the **New**, **Get**, **Set**, **Remove** **-CsInboundBlockedNumberPattern** cmdlets. You can manage a given pattern by using these cmdlets, including the ability to toggle the activation of a given pattern.

- Get-CsInboundBlockedNumberPattern returns a list of all blocked number patterns added to the tenant list including Name, Description, Enabled (True/False), and Pattern for each.
- New-CsInboundBlockedNumberPattern adds a blocked number pattern to the tenant list.
- Remove-CsInboundBlockedNumberPattern removes a blocked number pattern from the tenant list.
- Set-CsInboundBlockedNumberPattern modifies one or more parameters of a blocked number pattern in the tenant list.

Viewing and activating the entire call blocking feature is managed through the **Get**, **Set** **-CsTenantBlockingCallingNumbers** cmdlets.

- Get-CsTenantBlockedCallingNumbers returns the parameters for the global blocked number list including Enabled (True/False). There's a single global tenant policy that can't be modified manually other than to turn the feature on or off.
- Set-CsTenantBlockedCallingNumbers allows modifying the global tenant blocked calls to be turned on and off at the tenant level.

Examples

Block a number

In this example, the **Enabled** and **Description** parameters are optional.

```
New-CsInboundBlockedNumberPattern -Name “<name>” -Enabled $True -Description “<description>” -Pattern “^[+]?
13125550000”
```

Creating a new pattern adds the pattern as enabled by default. The description is an optional field to provide more information.

We recommend that you provide a meaningful name to easily understand why the pattern was added. In the case of simply blocking spam numbers, consider naming the rule the same as the number pattern that's being matched and add additional information in the description as required.

Patterns are matched using Regular Expressions (Regex). Allow time for replication before you test and validate.

Allow a number

In this example, the **Identity** parameter is required.

```
Remove-CsInboundBlockedNumberPattern -Identity “<identity>”
```

If the identity isn't known, use the **Get-CsInboundBlockedNumberPattern** cmdlet to first locate the proper pattern and note the identity. Then, run the **Remove-CsTenantBlockedNumberPattern** cmdlet and pass the appropriate identity value.

Allow time for replication before you test and validate.

View all number patterns

Running this cmdlet returns a list of all blocked numbers that are entered for a tenant:

```
Get-CsInboundBlockedNumberPattern
```

Use built-in PowerShell filtering abilities to parse the returned values as required.

Add number exceptions

You can add exceptions to blocked number patterns by using the **New**, **Get**, **Set**, **Remove -CsTenantBlockNumberExceptionPattern** cmdlets.

- New-CsTenantBlockedNumberExceptionPattern adds a number exception pattern to the tenant list.
- Get-CsTenantBlockedNumberExceptionPattern returns a list of all number exception patterns added to the tenant list.
- Set-CsTenantBlockedNumberExceptionPattern modifies one or more parameters to a number exception pattern in the tenant list.
- Remove-CsTenantBlockedNumberExceptionPattern removes a number exception pattern from the tenant list.

Examples

Add a number exception

In this example, a new number exception pattern is created and will by default add the pattern as enabled. The **Enabled** and **Description** parameters are optional.

```
New-CsTenantBlockedNumberExceptionPattern -Identity <XdsGlobalRelativeIdentity> -Tenant <GUID> -Pattern
<String> -Enabled <bool> -Description <string>
```

```
New-CsTenantBlockedNumberExceptionPattern -Identity InternationalPrefix -Tenant daacb588-18ef-4f77-8c83-
955af9615930 -Pattern "^011(\d*)$" -Description "Allow international prefix in US"
```

View all number exceptions

In this example, the **Identity** parameter is optional. If the **Identity** parameter isn't specified, this cmdlet returns a list of all number exception patterns entered for a tenant.

```
Get-CsTenantBlockedNumberExceptionPattern -Identity <XdsGlobalRelativeIdentity> -Tenant <GUID>
```

```
Get-CsTenantBlockedNumberExceptionPattern -Tenant daacb588-18ef-4f77-8c83-955af9615930
```

Modify a number exception

In this example, the **Identity** parameter is mandatory. The **Set-CsTenantBlockedNumberExceptionPattern** cmdlet lets you modify one or more parameters for a given number pattern identity.

```
Set-CsTenantBlockedNumberExceptionPattern -Identity <XdsGlobalRelativeIdentity> -Tenant <GUID> -Enabled <bool>
-Description <string> -Pattern <string>
```

```
Set-CsTenantBlockedNumberExceptionPattern -Identity InternationalPrefix -Tenant daacb588-18ef-4f77-8c83-
955af9615930  -Pattern "^022(\d*)$"
```

Remove a number exception

In this example, the **Identity** parameter is required. This cmdlet will remove the given number pattern from the tenant list. If the identity isn't known, use the **Get-CsInboundBlockedNumberPattern** cmdlet to first locate the proper pattern and note the identity. Then, run the **Remove-CsTenantBlockedNumberExceptionPattern** cmdlet and pass the appropriate identity value.Allow time for replication before you test and validate.

```
Remove-CsTenantBlockedNumberExceptionPattern -Identity <XdsGlobalRelativeIdentity> -Tenant <GUID>
```

```
Remove-CsTenantBlockedNumberExceptionPattern -Identity InternationalPrefix -Tenant daacb588-18ef-4f77-8c83-
955af9615930
```

Test whether a number is blocked

Use the **Test-CsInboundBlockedNumberPattern** cmdlet to verify whether a number is blocked in the tenant.

In this example, the **PhoneNumber** and **Tenant** parameters are required. The **PhoneNumber** parameter should be a numeric string without any additional characters such as + or -. In TRPS, the **Tenant parameter** is optional. The resulting **isNumberBlocked** parameter returns a value of True if the number is blocked in the tenant and False if it's not blocked.

```
Test-CsInboundBlockedNumberPattern –Tenant <GUID> -PhoneNumber <String>
```

```
Test-CsInboundBlockedNumberPattern -Tenant e09ad6bc-1d3c-4650-8cae-02f6c5a04b45 -PhoneNumber 4255550101
```

HTTPRESPONSECODE	ISNUMBERBLOCKED	ERRORMESSAGE
200	True	

```
Test-CsInboundBlockedNumberPattern -Tenant e09ad6bc-1d3c-4650-8cae-02f6c5a04b45 -PhoneNumber 6045550188
```

HTTPRESPONSECODE	ISNUMBERBLOCKED	ERRORMESSAGE
200	False	

A note about Regex

As stated earlier, the pattern matching for blocking callers is done by using Regex. Multiple tools are available online to help validate a Regex pattern match. If you aren't familiar with Regex patterns, we recommend that you take some time to familiarize yourself with the basics. To make sure you get expected results, use a tool for validating pattern matches before you add new blocked number matches to your tenant.

Call park and retrieve in Microsoft Teams

10/12/2020 • 2 minutes to read • Edit Online

Call park and retrieve is a feature that lets a user place a call on hold. When a call is parked, the service generates a unique code for call retrieval. The user who parked the call or someone else can then use that code with a supported app or device to retrieve the call. (See see Park a call in Teams for details.)

Some of the common scenarios for using call park are:

- A receptionist parks a call for someone working in a factory. The receptionist then announces the call and the code number over the public address system. The user who the call is for can then pick up a Teams phone on the factory floor and enter the code to retrieve the call.
- A user parks a call on a mobile device because the device battery is running out of power. The user can then enter the code to retrieve the call from a Teams desk phone.
- A support representative parks a customer call and sends an announcement on a Teams channel for an expert to retrieve the call and help the customer. An expert enters the code in Teams clients to retrieve the call

To park and retrieve calls, a user must be an Enterprise Voice user and and must be included in a call park policy.

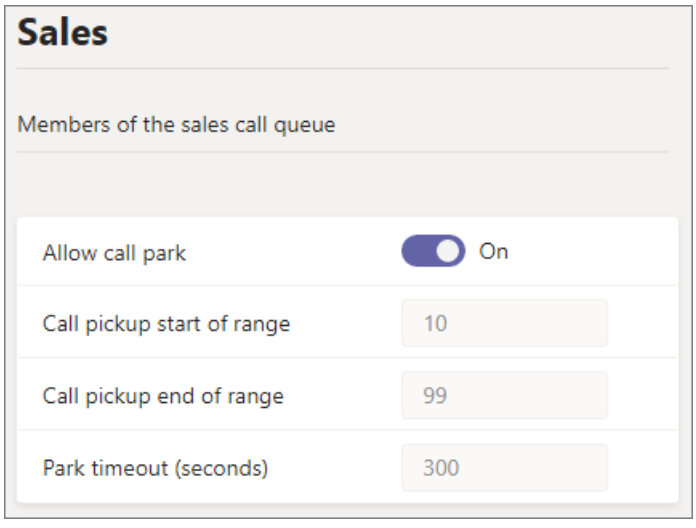
> **NOTE**
> Call park and retrieve is only available in Teams Only deployment mode and is not supported on Skype for Business IP phones.

Configure call park and retrieve

You must be a Teams admin to configure call park and retrieve. It is disabled by default. You can enable it for users and create user groups using the call park policy. When you apply the same policy to a set of users, they can park and retrieve calls among themselves.

To enable a call park policy

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Call park policies**.
2. On the **Manage policies** tab, click **Add**.
3. Give the policy a name, and then switch **Allow call park** to **On**.



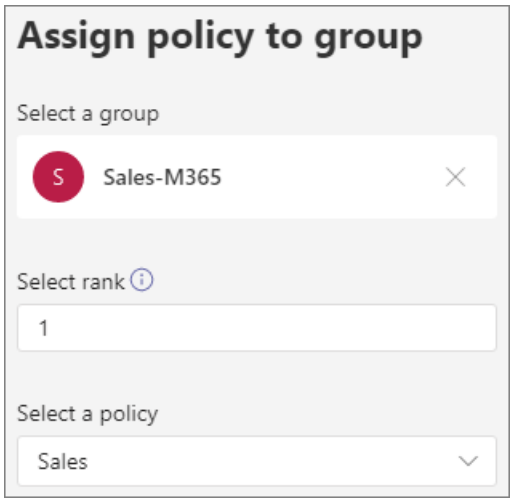
4. Select **Save**.

You can edit the policy by selecting it in the list and clicking **Edit**.

In order for the policy to work, it must be assigned to users. You can assign the policy to users individually or assign them to a group.

To assign a call part policy to a group

1. On the **Call park policies** page, on the **Group policy assignment** tab, click **Add group**.
2. Search for the group that you want to use, and then click **Add**.
3. Choose a rank compared to other group assignments.
4. Under **Select a policy**, choose the policy that you want to assign this group to.



5. Click **Apply**.

Related topics

Park a call in Teams

Assign policies to your users in Teams

New-CsTeamsCallParkPolicy

Set-CsTeamsCallParkPolicy

Grant-CsTeamsCallParkPolicy

Call sharing and group call pickup in Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

The call sharing and group call pickup features of Microsoft Teams let users share their incoming calls with colleagues so that the colleagues can answer calls that occur while the user is unavailable.

Group call pickup is less disruptive to recipients than other forms of call sharing (such as call forwarding or simultaneous ringing) because users can configure how they want to be notified of an incoming shared call (via audio and visual notification, visual only, or banner in the Teams app), and they can decide whether to answer it.

To share calls with others, a user creates a call group and adds the users they want to share their calls with. Then they choose a simultaneous ring or forward setting. See Call forwarding and simultaneous ring in Teams for details.

> **IMPORTANT**
>
> Users, the call group owner, and members of the call group must be in Teams Only deployment mode. For more details on Teams deployment modes, see Understand Microsoft Teams and Skype for Business coexistence and interoperability

License required

Users must be Enterprise Voice enabled to set up and use call sharing and group call pickup. For additional details on the licensing model, see Microsoft Teams service description.

Configure group call pickup

To set up group call pickup, a user first configures a call group (this is not the same as a security group or a Microsoft 365 group), and then adds the users they want to share their calls with. Then, they choose a simultaneous ring or call forward setting. For more information and step-by-step procedures, see Call forwarding and simultaneous ring in Teams.

Call group creation and notification preferences are user-driven features; administrators do not have to configure these features for their users. Call groups cannot be created from security groups or Microsoft 365 groups; they must be created in Teams.

Admins should enable call groups via the **TeamsCallingPolicy AllowCallGroups** setting for a user. Admins can also enable this via Teams Admin portal. In addition, the configured user can also configure their call groups via the client directly. Admin or end users cannot block the configuration by each other, but Teams Admin portal and Teams client should show this relationship accurately in both places.

Important: When admins turn off call groups for users (after it has been turned on and the call group relationships are configured), the admins have to clean up the call group relationships for users in the Teams admin center to avoid incorrect call routing.

Limitations

A tenant can contain a maximum of 32,768 call groups. There can be a maximum of 25 users in each call group.

More information

Call forwarding and simultaneous ring in Teams

Calling policies in Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

In Microsoft Teams, calling policies control which calling and call forwarding features are available to users. Calling policies determine whether a user can make private calls, use call forwarding or simultaneous ringing to other users or external phone numbers, route calls to voicemail, send calls to call groups, use delegation for inbound and outbound calls, and so on.

You can use the global (Org-wide default) policy that's created automatically or create and assign custom policies.

Create a custom calling policy

Follow these steps to create a custom calling policy.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Calling policies**.
2. Select **Add**.
3. Turn on or turn off the features that you want to use in your calling policy.
4. To control whether users can route inbound calls to voicemail, select **Enabled** or **User controlled**. To prevent routing to voicemail, select **Disabled**.
5. Select **Save**.

Edit a calling policy

Follow these steps to edit an existing calling policy.

1. In the left navigation of the Microsoft Teams admin center, select **Voice** > **Calling policies**.
2. Click next to the policy that you want to modify, and then select **Edit**.
3. Make the changes that you want, and then click **Save**.

Assign a custom calling policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Calling policy settings

Here's the settings that you can configure for calling policies.

Make private calls

This setting controls all calling capabilities in Teams. Turn this off to turn off all calling functionality in Teams.

Call forwarding and simultaneous ringing to people in your organization

This setting controls whether incoming calls can be forwarded to other users or can ring another person at the same time.

Call forwarding and simultaneous ringing to external phone numbers

This setting controls whether incoming calls can be forwarded to an external number or can ring an external number at the same time.

Voicemail is available for routing inbound calls

This setting enables inbound calls to be sent to voicemail. Valid options are:

- **Enabled** Voicemail is always available for inbound calls.
- **Disabled** Voicemail is not available for inbound calls.
- **User controlled** Users can determine whether they want voicemail to be available.

Inbound calls can be routed to call groups

> This is a preview or early release feature.

This setting controls whether incoming calls can be forwarded to a call group.

Allow delegation for inbound and outbound calls

> This is a preview or early release feature.

This setting enables inbound calls to be routed to delegates, allowing delegates to make outbound calls on behalf of the users for whom they have delegated permissions. For more information, see Share a phone line with a delegate.

Prevent toll bypass and send calls through the PSTN

Setting this to **On** will send calls through the PSTN and incur charges rather than sending them through the network and bypassing the tolls.

Busy on Busy is available while in a call

Busy on Busy (Busy Options) is a new setting that lets you configure how incoming calls are handled when a user is already in a call or conference or has a call placed on hold. New or incoming calls can be rejected with a busy signal. You can enable busy options at the tenant level or at the user level. Regardless of how their busy options are configured, users in a call or conference or those with a call on hold are not prevented from initiating new calls or conferences. This setting is disabled by default.

Allow web PSTN calling

This setting enables users to call PSTN numbers using the Teams web client.

Allow music on hold

This setting allows you to turn on or turn off music on hold when a PSTN caller is placed on hold. It's turned on by default. This setting doesn't apply to call park and boss delegate features, and is currently only available via PowerShell.

Related topics

Set-CSTeamsCallingPolicy

Assign policies to your users in Teams

Shared line appearance in Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

Shared line appearance is part of the delegation feature that lets a user choose a delegate to answer or handle calls on their behalf. This feature is helpful if a user has an administrative assistant who regularly handles the user's calls. In the context of shared line appearance, a manager is someone who authorizes a delegate to make or receive calls on their behalf, and a delegate can make and receive calls on behalf of someone else.

> **IMPORTANT**
>
> This feature is only available in Teams Only deployment mode. For more details on Teams deployment modes, see Understand Microsoft Teams and Skype for Business coexistence and interoperability

License required

A user must be have Phone System with PSTN connectivity (either a Calling Plan license or Direct Routing OnlineVoiceRoutingPolicy) to be a delegate or set up delegation and enable others to make or receive calls on their behalf.

Both managers and delegates need to have Phone System with PSTN connectivity (either a Calling Plan license or Direct Routing OnlineVoiceRoutingPolicy). The shared line experience is part of delegation and is included with Phone System. For additional details on the licensing model, See Microsoft Teams service description.

Configuring delegation and shared line appearance

Delegation and shared line appearance are user-driven features: there are no admin settings to configure. For information about how to use the feature, see Share a phone line with a delegate

The tenant admin can enable delegation via the **TeamsCallingPolicy AllowDelegation** setting or via Teams Admin Portal for this feature to work.

The tenant admin can also configure delegation relationships for a user in the Teams admin center. In addition, the end user can also configure their delegation relationships directly in Teams. The Tenant admin or the user cannot block the configuration by each other, but the Teams admin center and Teams client should show this relationship accurately in both places.

> **IMPORTANT**
>
> When the tenant admin turns off delegation for a user (after it has been turned on), they also need to clean up delegation relationships for that user in the Teams admin center to avoid incorrect call routing.

Shared line appearance feature availability

Shared line appearance is currently supported by the following apps and devices.

CAPABILITY	TEAMS DESKTOP	TEAMS MAC APP	TEAMS WEB APP (EDGE)	TEAMS MOBILE IOS/ANDROID APP	TEAMS IP PHONE
Set up delegation	Yes	Yes	Yes	No	Yes

CAPABILITY	TEAMS DESKTOP	TEAMS MAC APP	TEAMS WEB APP (EDGE)	TEAMS MOBILE IOS/ANDROID APP	TEAMS IP PHONE
Receive calls on behalf of another	Yes	Yes	Yes	Yes	Yes
Call a phone number on behalf of another	Yes	Yes	Yes	Yes	Yes
Call a Teams user on behalf of another	Yes	Yes	Yes	Yes	Yes
See the admin view of shared lines	Yes	Yes	Yes	No	No
See the admin view of manager's call activities	Yes	Yes	Yes	No	No
See the manager view of delegates	Yes	Yes	Yes	No	No
Admin or manager can hold or resume	Yes	Yes	Yes	No	No

Limitations

Managers can add up to 25 delegates, and delegates can have up to 25 managers. There is no limit to the number of delegation relationships that can be created in a tenant.

If the delegator and delegate are not in the same geographic location, it is up to the PSTN provider to allow caller ID to show up from a different geographic location for a delegated (on behalf of) call.

More information

Share a phone line with a delegate

Dial pad configuration

7/1/2020 • 3 minutes to read • Edit Online

In the Teams client, the dial pad enables users to access Public Switched Telephone Network (PSTN) functionality. The dial pad is available for users with a Phone System license, provided they are configured properly. The following criteria are all required for the dial pad to show:

- User has an enabled Phone System ("MCOEV") license
- User has Microsoft Calling Plan or is enabled for Direct Routing
- User has Enterprise Voice enabled
- User is homed online and not in Skype for Business on premises
- User has Teams Calling Policy enabled

The following sections describe how to use PowerShell to check the criteria. In most cases, you need to look at various properties in the output of the Get-CsOnlineUser cmdlet. Examples assume $user is either the UPN or sip address of the user.

User has an enabled Phone System ("MCOEV") license

You must ensure that the assigned plan for the user shows the **CapabilityStatus attribute set to Enabled** and the **Capability Plan set to MCOEV** (Phone System license). You might see MCOEV, MCOEV1, and so on. All are acceptable--as long as the Capability Plan starts with MCOEV.

To check that the attributes are set correctly, use the following command:

```
Get-CsOnlineUser -Identity $user|select AssignedPlan|fl
```

The output will look like the following. You only need to check the **CapabilityStatus** and the **Capability Plan** attributes:

```
<Plan SubscribedPlanId="2f9eda01-4630-4a5c-bdb3-cf195f22d240"
   ServiceInstance="MicrosoftCommunicationsOnline/NOAM-0M-DMT"
   CapabilityStatus="Enabled"
   AssignedTimestamp="2020-04-21T18:31:13Z"
   ServicePlanId="4828c8ec-dc2e-4779-b502-87ac9ce28ab7"
   xmlns="http://schemas.microsoft.com/online/directoryservices/change/2008/11">
  <Capability>
     <Capability Plan="MCOEV"
     xmlns="http://schemas.microsoft.com/online/MCO/2009/01"/>
  </Capability>
</Plan>
```

User has Microsoft Calling Plan OR is enabled for Direct Routing

If the user has Microsoft Calling Plan, you must ensure that the **CapabilityStatus attribute is set to Enabled**, and that the **Capability Plan is set to MCOPSTN**. You might see MCOPSTN1, MCOPSTN2, and so on. All are acceptable--as long as the Capability Plan starts with MCOPSTN.

To check the attributes, use the following command:

```
Get-CsOnlineUser -Identity $user|select AssignedPlan|fl
```

The output will look like the following. You only need to check the **CapabilityStatus** and the **Capability Plan** attributes:

```
<Plan SubscribedPlanId="71d1258e-a4e6-443f-884e-0f3d6f644bb1"
ServiceInstance="MicrosoftCommunicationsOnline/NOAM-0M-DMT"
CapabilityStatus="Enabled"
AssignedTimestamp="2018-09-18T18:41:42Z"
ServicePlanId="5a10155d-f5c1-411a-a8ec-e99aae125390"
xmlns="http://schemas.microsoft.com/online/directoryservices/change/2008/11">
 <Capability>
    <Capability Plan="MCOPSTN2"
    xmlns="http://schemas.microsoft.com/online/MCO/2009/01" />
 </Capability>
</Plan>
```

If the user is enabled for Direct Routing, the user must be assigned a non-null value for OnlineVoiceRoutingPolicy. To check the attribute, use the following command:

```
Get-CsOnlineUser -Identity $user|Select OnlineVoiceRoutingPolicy
```

The output should have a non-null value, for example:

```
OnlineVoiceRoutingPolicy
------------------------
Test_Policy
```

User has Enterprise Voice enabled

To check if the user has Enterprise Voice enabled, use the following command:

```
Get-CsOnlineUser -Identity $user|Select EnterpriseVoiceEnabled
```

The output should look like:

```
EnterpriseVoiceEnabled
----------------------
                  True
```

User is homed online and not in Skype for Business on premises

To ensure the user is homed online and not in Skype for Business on premises, the RegistrarPool must not be null and the HostingProvider must contain a value that starts with "sipfed.online." To check the values, use the following command:

```
Get-CsOnlineUser -Identity $user|Select RegistrarPool, HostingProvider
```

The output should be similar to:

```
RegistrarPool                HostingProvider
-------------                ---------------
sippoolbn10M02.infra.lync.com sipfed.online.lync.com
```

User has Teams Calling Policy enabled

The user's effective TeamsCallingPolicy must have AllowPrivateCalling set to true. By default, users inherit the global policy, which has AllowPrivateCallingPolicy set to true by default.

To get the TeamsCallingPolicy for a user and to check that AllowPrivateCalling is set to true, use the following command:

```
if (($p=(get-csonlineuser -Identity $user).TeamsCallingPolicy) -eq $null) {Get-CsTeamsCallingPolicy -Identity
global} else {get-csteamscallingpolicy -Identity $p}
```

The output should look like:

```
Identity                   : Global
Description                :
AllowPrivateCalling        : True
AllowWebPSTNCalling        : True
AllowVoicemail             : UserOverride
AllowCallGroups            : True
AllowDelegation            : True
AllowCallForwardingToUser  : True
AllowCallForwardingToPhone : True
PreventTollBypass          : False
BusyOnBusyEnabledType      : Disabled
MusicOnHoldEnabledType     : Enabled
```

Additional notes

- You may need to restart the Teams client after making any of these configuration changes.
- If you recently updated any of the above criteria, you may need to wait a few hours for the client to receive the new settings.
- If you still don't see the dial pad, check if there is a provisioning error by using the following command:

```
Get-CsOnlineUser -Identity $user|Select McoValidationError
```

- If it has been more than 24 hours and you are still seeing problems, contact Support.

Which Calling Plan is right for you?

12/5/2020 • 2 minutes to read • Edit Online

You've completed the Get started. You've rolled out Teams with chat, teams, channels, & apps across your organization. Maybe you've deployed Meetings & conferencing. Now you're ready to add cloud voice workloads, and you've decided to use Microsoft Phone System with Calling Plan to connect to the Public Switched Telephone Network (PSTN).

This article describes core deployment decisions for Calling Plans as well as additional considerations you may want to configure, based on your organization's needs. You should also read Cloud Voice in Microsoft Teams for more information about Microsoft's cloud voice offerings.

Learn more about Calling Plans

The following articles provide more information about deploying and using Microsoft Calling Plans:

- Phone System in Microsoft 365 or Office 365
- Calling Plans for Microsoft 365 or Office 365
- Set up Calling Plans

Core deployment decisions

To use Microsoft as your telephony carrier, you need to obtain Calling Plan licenses and assign them to your Phone System users.

There are two types of Calling Plans available:

- Domestic Calling Plans
- Domestic and International Calling Plans

ASK YOURSELF	ACTION
Are Calling Plans available in my area? Which user locations will have Calling Plan service?	For more information, see Country and region availability for Audio Conferencing and Calling Plans.
Do my users need international calling?	For more information, see Calling Plans for Microsoft 365 or Office 365.
Do my users have Calling Plans licenses?	To buy and assign licenses, see Step 2: Buy and assign licenses.
Do my users each have a direct inward dial (DID) phone number?	To get phone numbers, see Step 3: Get phone numbers.

Transfer phone numbers to Microsoft 365 or Office 365

It's easy to transfer your phone numbers from your current service provider to Teams. After you port your phone numbers to Teams, Microsoft will become your service provider and will bill you for those phone numbers. For more information, see Transfer phone numbers to Teams.

Phone numbers and emergency locations

With Calling Plans in Microsoft 365 or Office 365, every user in your organization needs to have a unique direct inward dial (DID) phone number and a corresponding validated emergency address. You can also specify an emergency location within the emergency address (for example, an office number or floor number).

ASK YOURSELF	ACTION
How detailed do I want the emergency address and location information to be?	For more information, see What are emergency locations, addresses, and call routing?.

Calling identity

By default, all outbound calls use the assigned phone number as calling identity (caller ID). The recipient of the call can quickly identify the caller and decide whether to accept or reject the call.

ASK YOURSELF	ACTION
Do I want to mask or disable caller ID?	To change or block the caller ID, see Set the caller ID for a user.

Calling Plans for Microsoft 365

12/5/2020 • 2 minutes to read • Edit Online

Calls to other Skype for Business and Microsoft Teams users are free, but if you want your users to be able to call regular phones, and you don't already have a service provider to make voice calls, you need to buy a Calling Plan. For more information, see Phone System and Calling Plans.

Here are the Calling Plans options:

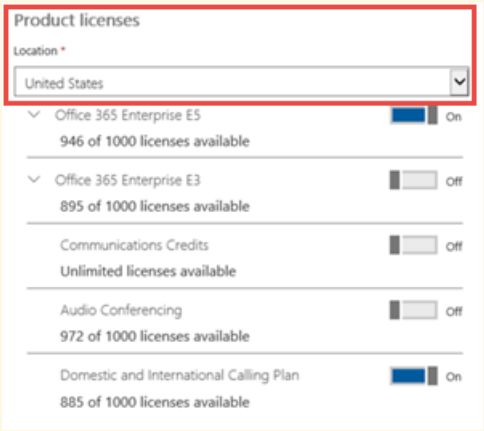
- **Domestic Calling Plan**: Licensed users can call out to numbers located in the country/region where they are assigned in Microsoft 365 or Office 365.
- **Domestic and International Calling Plan**: Licensed users can call out to numbers located in the country/region where their Microsoft 365 or Office 365 license is assigned to the user based on the user's location, and to international numbers in 196 countries/regions.

All users in the same country/region (this is the user country location defined in the licensing area of the Microsoft 365 admin center) with the same Calling Plan share a pool of minutes. For example, if you have 100 users located in the same country/region with a 120 minutes Domestic Calling Plan assigned, they share a pool of 12,000 minutes. All calls exceeding these minutes are billed per minute.

Visit Country and region availability to find out about monthly minutes available for each organization in each country/region.

IMPORTANT

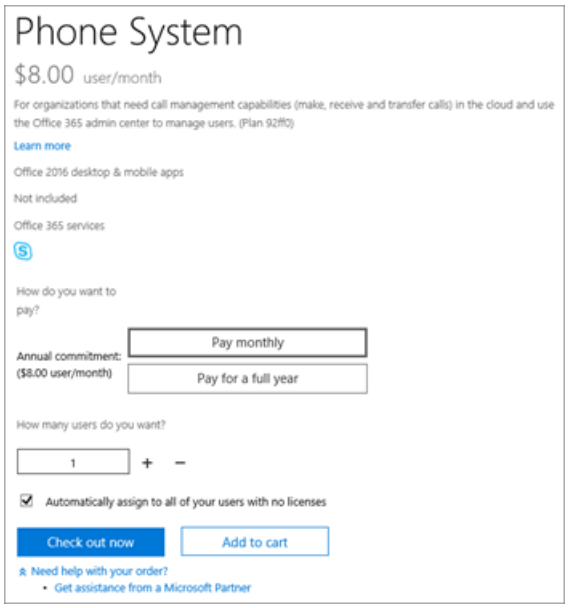
The country/region is based on the location of the user's license in the **Microsoft 365 admin center** > **Active users** and **NOT** the billing address listed under the **Organization Profile** in the **Microsoft 365 admin center**.



For detailed information about usage limits and terms of use, see Audio Conferencing complimentary dial-out period.

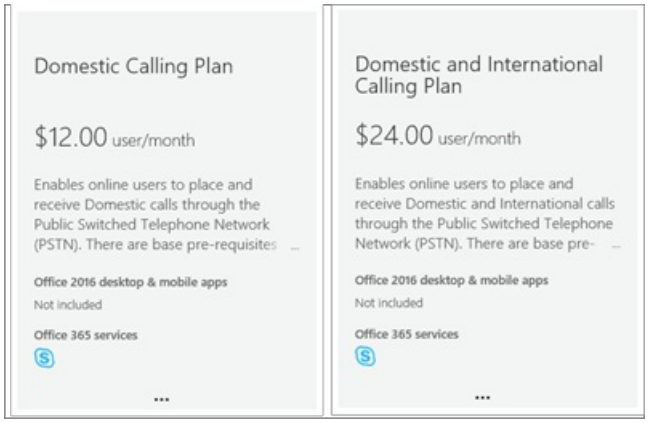
How to buy a Calling Plan

1. You must first purchase a **Phone System add-on license. To do that, sign in to the Microsoft 365 admin center and choose **Billing > Purchase services > Add-on subscriptions > Buy now.



> **NOTE**
>
> Depending on your plan, you may need to buy more add-ons before you can buy Phone System licenses. To learn more, see Microsoft Teams add-on licensing.

2. After you buy Phone System licenses, you can buy the Calling Plan by signing in to the **Microsoft 365 admin center**, choose **Billing** > **Purchase services** > **Add-on subscriptions**, and then clicking **Buy now**. You'll see the Calling Plans there.



You can buy and assign different Calling Plans to different users, depending on the needs of your organization. After you select the Calling Plan you need, proceed to checkout. You assign a plan to each user in the Microsoft 365 admin center. To learn how, see Assign Microsoft Teams add-on licenses.

Do you have a service provider that provides on-premises PSTN connectivity for hybrid users?

If so, you don't need to buy a Calling Plan. Office 365 Enterprise E5 includes the **Phone System** add-on, so you can proceed to checkout.

Then, assign the Enterprise E5 or **Phone System** add-on licenses to users in the Microsoft 365 admin center. To learn how, see Assign Microsoft Teams add-on licenses.

Pricing information

- Pricing for Calling Plans and Phone System

- Pricing for Audio Conferencing

For more information

Here are more articles that explain how to set up your Calling Plans:

- Set up Calling Plans
- Microsoft Teams add-on licensing
- Here's what you get with Phone System in Microsoft 365 or Office 365

Related topics

- Set up Skype for Business Online
- Set up Cloud Voicemail - Admin help
- Set up Calling Plans
- Add funds and manage Communications Credits

Set up Calling Plans

8/17/2020 • 3 minutes to read • Edit Online

Calls to other Teams users are free, but if you want your users to be able to call phones outside of your business, get a Domestic Calling Plan or an International Calling Plan in Microsoft 365 or Office 365. It's easy to set up Calling Plans for your business. For more information about Calling Plans, see Which Calling Plan is right for you?.

Step 1: Find out if Calling Plans are available in your country/region

Go to Country and region availability for Audio Conferencing and Calling Plans and select your country or region to get availability information about Calling Plans, as well as information about Audio Conferencing, Phone System, toll and toll-free numbers, and Communications Credits.

If Calling Plans are not available for your country or region, consider using Direct Routing to connect your on-premises telephony infrastructure to Phone System. For more information, see Phone System Direct Routing.

Step 2: Buy and assign licenses

1. If the Phone System feature isn't included in your Microsoft 365 or Office 365 plan, you may need to purchase **Phone System** add-on licenses. After you have **Phone System** licenses, purchase Calling Plans for Microsoft 365 or Office 365. See Microsoft Teams add-on licensing, and buy the licenses and plan.

   > **TIP**
   > **Phone System** licenses and Calling Plans in Microsoft 365 or Office 365 go together, so to see the option to purchase Calling Plans, you must first have the **Phone System** licenses.

2. First assign the licenses, and then assign a Calling Plan to the people in your organization. See Assign Microsoft Teams add-on licenses.

Step 3: Get phone numbers

There are three ways to get new user numbers:

- **Use the Teams admin center.** For some countries/regions, you can get numbers for your users by using the Teams admin center, see Getting phone numbers for your users.
- **Port your existing numbers.** You can port or transfer existing numbers from your current service provider or phone carrier to Microsoft 365 or Office 365. For more information, see Transfer phone numbers to Teams or Manage phone numbers for your organization.
- **Use a request form for new numbers.** Sometimes (depending on your country/region) you won't be able to get your new phone numbers using the Teams admin center, or you will need specific phone numbers or area codes. If so, you will need to download a form and send it back to us. For more information, see Manage phone numbers for your organization.

Step 4: Add emergency addresses and locations for your organization

An emergency address must be associated with a phone number. When this association happens can vary

among country and regions. For example, in the United States, you need to associate an emergency address when you assign the phone number to the user. In the United Kingdom, you need to associate an emergency address to the phone number when you are getting the phone numbers from Microsoft 365 or Office 365, or when transferring phone numbers from your current service provider.

For information about emergency calling and managing emergency addresses, see Manage emergency calling and Add, change, or remove an emergency location for your organization.

Step 5: Assign an emergency address and a phone number to a user

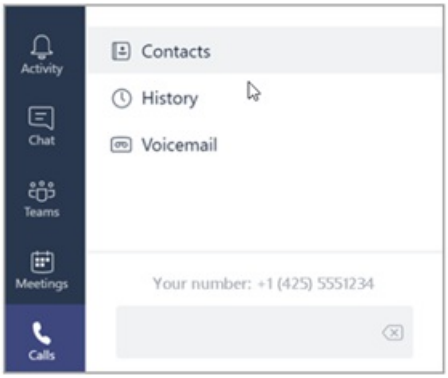
When you are setting up Calling Plans in Office 365, you must assign a phone number and emergency address to each of your users. The emergency address must be created before you can associate it with a phone number. For more information, see Assign or change an emergency address.

> **TIP**
>
> If you add more people to your business right before doing this step, it may take **several hours** for them to appear on the **Voice users** page. There's a latency.

Step 6: Tell your users about their new phone numbers

Microsoft recommends sending mail or using your business's preferred communication method to tell the people about their new phone numbers.

In **Microsoft Teams**, users can see their phone number by clicking **Calls** in the left navigation. The phone number is shown above the dial pad.



Do you want to automate assigning phone numbers?

If you know Windows PowerShell, you can use the following cmdlets to automate assigning phone numbers to your users.

- Get-CsOnlineTelephoneNumber: Retrieves the telephone numbers from the Business Voice Directory.
- Set-CsOnlineVoiceUser: Sets the telephone numbers.

To learn more, see Teams PowerShell Overview.

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Manage emergency calling

Add, change, or remove an emergency location for your organization

Emergency calling terms and conditions

Teams: Emergency Calling disclaimer label

Quick start guide: Configuring Calling Plans in Microsoft Teams

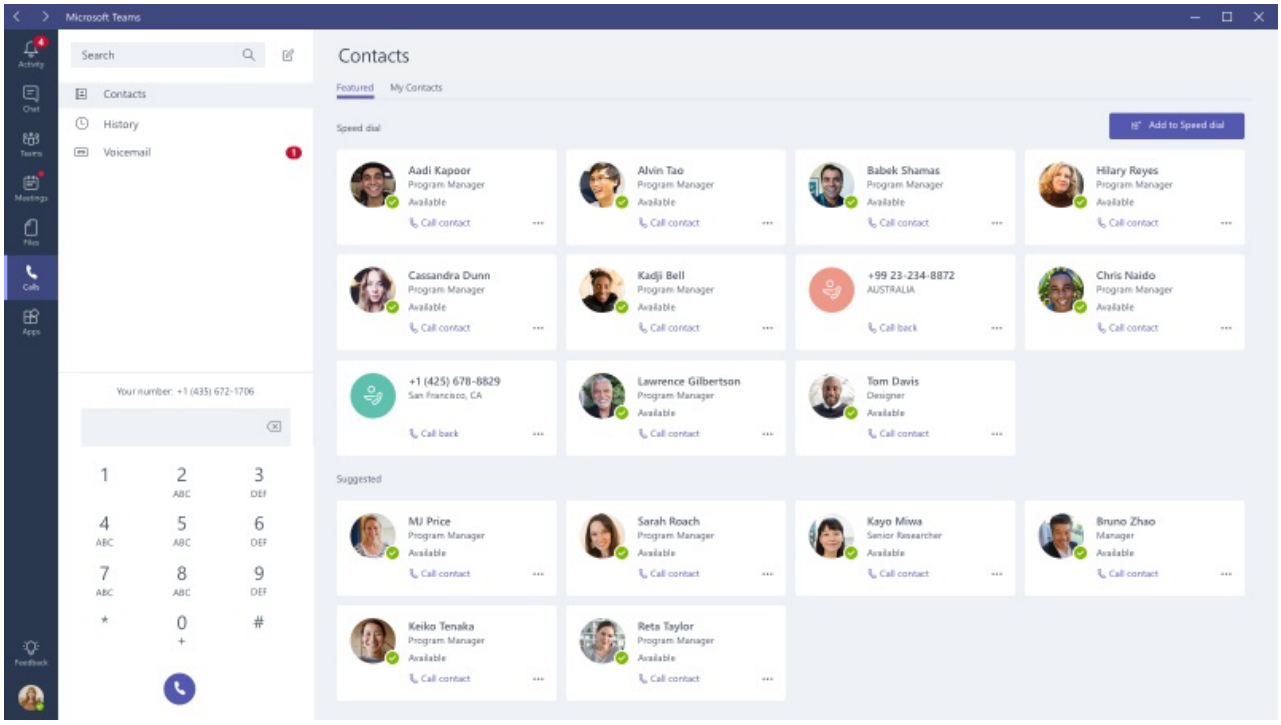
11/2/2020 • 3 minutes to read • Edit Online

This guide will help you get a set of users up and running so they can explore Calling Plans in Teams.

Read the December 12, 2017, announcement of Calling Plans in Teams: Intelligent Communications takes the next step with calling in Teams

> **NOTE**
>
> We recommend that, in parallel with this quick-start guide, you read Phone System with Calling Plans and FastTrack to plan and drive a successful rollout.

By adding Calling Plans - a Microsoft 365 and Office 365 feature powered by Skype for Business - you can now use Teams to make and receive phone calls to or from land lines and mobile phones via the public switched telephone network (PSTN).



Prerequisites for enabling the **Calls** tab in Teams

To enable the **Calls** tab in Teams users need to have 1:1 calling enabled in Teams and using a Teams client that supports 1:1 Teams calling. To learn how to manage 1:1 calling in Teams, read Set-CsTeamsCallingPolicy. To learn which clients support calling, please read Limits and specifications for Microsoft Teams.

> **NOTE**
>
> Currently, Voicemail will not be available in the Calls tab unless the user is enabled for PSTN calls.

Prerequisites for enabling the **Dial Pad** in Teams

To enable the **Dial Pad** tab in Teams and allow your users to make and receive PSTN calls you will need to provision users for Phone System and Calling Plans. To learn how to set up Calling Plans, read Set up Calling Plans. Additionally, for Teams only users, you must ensure that "Allow private calling" is enabled in the Teams calling policy. See Manage Teams during the transition to the new Microsoft Teams admin center for more information.

> **NOTE**
>
> You can also use Direct Routing to allow your users to make and receive PSTN calls. To learn how to set up Direct Routing, read Configure Direct Routing.

Using TeamsUpgradePolicy to control where calls land

To control whether incoming calls (and chats) land in Teams or Skype for Business, administrators use TeamsUpgradePolicy, using either Microsoft Teams admin center or using a remote Windows PowerShell session with the Skype for Business cmdlets.

The default configuration of TeamsUpgradePolicy is Islands mode, which is designed to ensure that existing business workflows are not interrupted during a Teams deployment. By default, VoIP, PSTN, and federated calls to your users will continue to be routed to Skype for Business until you update the policy to enable inbound calling to Teams. When recipients are in islands mode:

- Incoming VOIP calls that originated in Skype for Business always land in the recipient's Skype for Business client.
- Incoming VOIP calls that originated in Teams land in Teams, *if the sender and receiver are in the same tenant*.
- Incoming federated VOIP (regardless of which client originates) and PSTN calls always land in the recipient's Skype for Business client.

To ensure that incoming VOIP and PSTN calls always land in a user's Teams client, update the user's coexistence mode to be TeamsOnly (which means, assign them the "UpgradeToTeams" instance of TeamsUpgradePolicy. For more information on coexistence modes and TeamsUpgradePolicy, see Migration and interoperability guidance for organizations using Teams together with Skype for Business

NOTES

- Skype for Business IP phones will receive calls, even if the user is in TeamsOnly mode.
- Users that have been provisioned with Phone System and Calling Plans licenses for use with Skype for Business Online (e.g. they have been assigned a value of OnlineVoiceRoutingPolicy) , will have the Calls tab enabled in Teams and can place outbound PSTN calls from Teams without administrators having to take any administrative action.

How to configure users to receive all incoming VOIP and PSTN calls in Teams

To ensure users receive all incoming VOIP and PSTN calls in Teams, set the user's coexistence mode to TeamsOnly in the Microsoft Teams admin center, or use Skype for Business remote Windows PowerShell session to update TeamsUpgradePolicy as follows:

```
Grant-CsTeamsUpgradePolicy -PolicyName UpgradeToTeams -Identity user@contoso.com
```

See also

Set up Calling Plans

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Phone System with Calling Plans

Skype for Business PowerShell cmdlet reference

Country and region availability for Audio Conferencing and Calling Plans

11/2/2020 • 7 minutes to read • Edit Online

You can select a country or region to see what cloud voice features are available to your organization.

Select your country or region to see what's available for your organization

If you're looking for a spreadsheet with all countries and regions, download and save the Cloud voice feature country/region availability spreadsheet.

After you've verified if one of the Skype for Business or Microsoft Teams services are available, you can see Skype for Business and Microsoft Teams add-on licensing to help you buy licenses and assign them to your users.

> **NOTE**
> If you need to get more telephone numbers for your users, see Getting phone numbers for your users or, for phone number request forms, Manage phone numbers for your organization.

Want to learn more about these services

Audio Conferencing

Sometimes people in your organization will need to use a phone to call in to a meeting. Skype for Business and Microsoft Teams includes the Audio Conferencing feature for just this situation! People can call in to meetings using a phone instead of using the Skype for Business and Microsoft Teams apps on a mobile device or PC. When you've decided that you want Audio Conferencing for your organization, buy one **Audio Conferencing** license for each person in your organization who is going to schedule/host an audio meeting.

With Audio Conferencing, there are toll and toll free phone numbers that can be used by your users to dial in to meetings. Toll numbers from the following countries or regions are automatically assigned as shared audio conferencing numbers to organizations when they're enabled for Audio Conferencing. Dedicated toll and toll free numbers can be assigned to your organization from additional cities.

> **IMPORTANT**
> There isn't a resource that contains a listing of all of the dial-in numbers for Audio Conferencing. To find out if there are dial-in phone numbers available in your area or country/region, go to **Skype for Business admin center** > **Voice** > **Phone Numbers**, click **Add**, and then click **New Service Numbers**. Use the lists for **Country/Region**, **State/Region**, and **City** to filter your search. If you are looking for toll free service numbers, select **toll free** from the **State/Region** list.

To see more about Audio Conferencing, see Audio Conferencing common questions

Pricing for Audio Conferencing

Using the Call Me feature or when adding other people to a meeting so they can join it

In Audio Conferencing, the "*Call Me*" feature is used to let other people join a dial-in meeting. Use the drop-down list in this article to search for the country/region and see if this feature is available.

Caution

Dialing out to toll free or free phone numbers may not be possible, because some toll free numbers only function from within a certain country or area within a country. For example, if you dial out from the United States to a toll free number in Brazil, the call may not be successful because the call didn't originate from within Brazil or from a specific region within Brazil. The ability to dial out to toll free numbers varies widely depending on the restrictions of the toll free number dialed. Unfortunately, we can't control this behavior, and as a result, your experience may vary depending on the toll free number dialed and the restrictions of the toll free number.

Dialing out from a meeting to another country/region in the world that isn't listed below is available using Communication Credits. For those users, you'll need to Set up Communications Credits for your organization.

Phone System

With Phone System, you create auto attendants and call queues (with a toll or toll free number) to answer incoming calls for your organization. When you add a Calling Plan for users, they can use Skype for Business to take care of basic call-control tasks, such as placing and receiving calls, transferring calls, and muting and unmuting calls. **Phone System** users click a name in their address book, and Skype for Business will place a call to that person. To place and receive calls, **Phone System** users use their mobile devices, a headset with a laptop or PC, or one of many IP phones that work with Skype for Business.

> The availability of toll phone numbers from some of these locations might vary at any given time depending on inventory levels. In addition to getting phone numbers for individual users, it's also possible to search and acquire toll or toll free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants and call queues. These are called service numbers. See Getting service phone numbers to get phone numbers. But for your users, after you assign a Calling Plan to them, you can assign a user phone number so they can make and receive phone calls. To find those phone numbers, go to Getting phone numbers for your users. You can also see Assign, change, or remove a phone number for a user.

Pricing for Phone System

> **NOTE**
> The availability of toll phone numbers from some of these locations might vary at any given time depending on inventory levels.

Use the drop-down list at the top of the page to search for a country or region and what services are available.

Calling Plans

Along with Phone System, a Calling Plans let users make and receive phone calls. You first get a user (subscriber) phone number (not a service number) to assign to the user, and then assign a Calling Plan. There are two types of Calling Plans available: **Domestic** and **Domestic and International**. See Phone System and Calling Plans for more details.

You can also see Phone System and Calling Plans licensing for licensing information.

> **NOTE**
> The country/region is based on the location of the user's license in the **Microsoft 365 admin center** > **Active Users** and **not** the billing address listed under the **Organization Profile** in the **Microsoft 365 admin center**.

Toll and toll free phone numbers for services

In addition to getting phone numbers for individual users, it's also possible to search and acquire toll or toll free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants, and call queues. These are called service numbers.

The following is a list of capitals and major cities from where you can get toll service numbers to use with Audio Conferencing and Calling Plans. You get toll service numbers from these locations using the **Skype for Business admin center**.

If you want to get a toll or toll free service number, you can see Getting service phone numbers. If you already have a toll or toll free service number that you want to transfer from a different provider, see Manage phone numbers for your organization.

Use the drop-down list at the top of the page to search for a country or region and what services are available.

Communications Credits

We recommend that you set up Communications Credits for your Audio Conferencing and Calling Plans users that need the ability to dial out to **any destination**. Many countries/regions are included, but some destinations might not be included in your Calling Plan or Audio Conferencing subscriptions.

If you don't set up Communications Credits and assign a license to users, and you run out of minutes for your organization (depending on your Calling Plan or Audio Conferencing plan or your country/region), they won't be able to make calls or dial out from meetings. You can find out more information including recommended funding amounts by reading What are Communications Credits?

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Phone System Direct Routing

12/5/2020 • 2 minutes to read • Edit Online

You've completed Get started. You've rolled out Teams with chat, teams, channels, & apps across your organization. Maybe you've deployed Meetings & conferencing. Now you're ready to add cloud voice workloads, and you've decided to use your own telephony carrier for Public Switched Telephone Network (PSTN) connectivity by using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

This article describes core deployment decisions for Direct Routing as well as additional considerations you may want to think about, based on your organization's needs. You should also read Cloud Voice in Microsoft Teams for more information about Microsoft's cloud voice offerings.

Learn more about Direct Routing

The following articles provide more information about configuring and using Phone System Direct Routing. Configuring Direct Routing requires understanding of PSTN routing design. You should read all of these articles to understand how to plan and configure Direct Routing:

- Plan Direct Routing
- Configure Direct Routing
- List of Session Border Controllers certified for Direct Routing
- Monitor and troubleshoot Direct Routing

In addition, you might want to read the following articles depending on your requirements:

- Configure a Session Border Controller for multiple tenants
- Migrate to Direct Routing
- User accounts in a hybrid environment with PSTN connectivity
- Watch the following session to learn more about Direct Routing: Direct Routing in Microsoft Teams

Core deployment decisions

These are the core decisions to consider for Direct Routing.

ASK YOURSELF	ACTION
For which users will I enable Direct Routing?	For more information, see Enable users for Direct Routing Service.
Do I have the required licenses for Direct Routing?	For more information, see Licensing and other requirements.

Session Border Controller (SBC) considerations

With Direct Routing, you connect your own Session Border Controller (SBC) directly to Phone System. For a list of certified SBCs, see Supported Session Border Controllers.

ASK YOURSELF	ACTION
Where and how will I deploy SBCs?	For more information, see Configure Direct Routing
Do I have multiple tenants?	For more information, see Configure a Session Border Controller for multiple tenants.

Voice routing considerations

You'll need to configure Phone System to route the calls to the specific SBCs.

ASK YOURSELF	ACTION
What voice routing policies, PSTN usage, and voice routes do I need to create?	For voice routing information, see Configure Voice Routing.
Which users will be assigned to the voice routing policy that I define?	See the examples in Configure Voice Routing.

Ensure incoming calls land in the Teams client using TeamsUpgradePolicy

Direct Routing is only supported with Microsoft Teams. To receive PSTN calls through Direct Routing, you need to configure TeamsUpgradePolicy to ensure incoming calls are received in Teams. Users must be in Teams Only mode, which you can do by assigning them the "UpgradeToTeams" instance of TeamsUpgradePolicy.

ASK YOURSELF	ACTION
What does Teams Only mode mean?	For more information, see Migration and interoperability guidance for organizations using Teams together with Skype for Business.

Additional deployment considerations

You may want to consider the following, based on your organization's needs and configuration:

ASK YOURSELF	ACTION
Do you have an existing Skype for Business Server deployment with hybrid connectivity configured?	To understand how user accounts in a hybrid environment are provisioned and managed, see User accounts in a hybrid environment with PSTN connectivity.
Are you migrating to Direct Routing from Calling Plan or from a Skype for Business on-premises environment?	To understand more about migrating to Direct Routing from an existing environment, see Migrating to Direct Routing.

Plan Direct Routing

12/5/2020 • 17 minutes to read • Edit Online

TIP

Watch the following session to learn about the benefits of Direct Routing, how to plan for it, and how to deploy it: Direct Routing in Microsoft Teams

Microsoft Phone System Direct Routing lets you connect a supported, customer-provided Session Border Controller (SBC) to Microsoft Phone System. With this capability, for example, you can configure on-premises Public Switched Telephone Network (PSTN) connectivity with Microsoft Teams client, as shown in the following diagram:



NOTE

Skype for Business Online also lets you pair a customer-provided SBC, but this requires an on-premises Skype for Business Server deployment or a special edition of Skype for Business, called Cloud Connector, in between the SBC and the Microsoft Cloud. This scenario is known as hybrid voice. In contrast, Direct Routing allows a direct connection between the supported SBC and the Microsoft Cloud.

IMPORTANT

Cloud Connector Edition will retire July 31, 2021 along with Skype for Business Online. Once your organization has upgraded to Teams, learn how to connect your on-premises telephony network to Teams using Direct Routing.

With Direct Routing, you can connect your SBC to almost any telephony trunk or interconnect with third-party PSTN equipment. Direct Routing enables you to:

- Use virtually any PSTN trunk with Microsoft Phone System.
- Configure interoperability between customer-owned telephony equipment, such as a third-party private branch exchange (PBX), analog devices, and Microsoft Phone System.

Microsoft also offers all-in-the-cloud voice solutions, such as Calling Plan. However, a hybrid voice solution might be best for your organization if:

- Microsoft Calling Plan is not available in your country.
- Your organization requires connection to third-party analog devices, call centers, and so on.
- Your organization has an existing contract with a PSTN carrier.

Direct Routing also supports users who have the additional license for the Microsoft Calling Plan. For more information, see Phone System and Calling Plans.

With Direct Routing, when users participate in a scheduled conference, the dial-in number is provided by Microsoft Audio Conferencing service, which requires proper licensing. When dialing out, the Microsoft Audio Conferencing service places the call using online calling capabilities, which requires proper licensing. (Note if a user does not have a Microsoft Audio Conferencing license, the call routes through Direct Routing.) For more information, see Online Meetings with Teams.

Planning your deployment of Direct Routing is key to a successful implementation. This article describes infrastructure and licensing requirements and provides information about SBC connectivity:

- Infrastructure requirements
- Licensing and other requirements
- SBC domain names
- Public trusted certificate for the SBC
- SIP Signaling: FQDNs
- SIP Signaling: Ports
- Media traffic: Port ranges
- Supported Session Border Controllers (SBCs)

For detailed information about configuring Direct Routing, see Configure Direct Routing.

Infrastructure requirements

The infrastructure requirements for the supported SBCs, domains, and other network connectivity requirements to deploy Direct Routing are listed in the following table:

INFRASTRUCTURE REQUIREMENT	YOU NEED THE FOLLOWING
Session Border Controller (SBC)	A supported SBC. For more information, see Supported SBCs.
Telephony trunks connected to the SBC	One or more telephony trunks connected to the SBC. On one end, the SBC connects to the Microsoft Phone System via Direct Routing. The SBC can also connect to third-party telephony entities, such as PBXs, Analog Telephony Adapters, and so on. Any PSTN connectivity option connected to the SBC will work. (For configuration of the PSTN trunks to the SBC, please refer to the SBC vendors or trunk providers.)
Microsoft 365 or Office 365 organization	An Microsoft 365 or Office 365 organization that you use to home your Microsoft Teams users, and the configuration and connection to the SBC.

INFRASTRUCTURE REQUIREMENT	YOU NEED THE FOLLOWING

User registrar	User must be homed in Microsoft 365 or Office 365.
	If your company has an on-premises Skype for Business or Lync environment with hybrid connectivity to Microsoft 365 or Office 365, you cannot enable voice in Teams for a user homed on-premises.
	
	To check the registrar of a user, use the following Skype for Business Online PowerShell cmdlet:
	`Get-CsOnlineUser -Identity <user> | fl HostingProvider`
	
	The output of the cmdlet should show:
	`HostingProvider : sipfed.online.lync.com`

Domains	One or more domains added to your Microsoft 365 or Office 365 organizations. Note that you cannot use the default domain, *.onmicrosoft.com, that is automatically created for your tenant. To view the domains, you can use the following Skype for Business Online PowerShell cmdlet: `Get-CsTenant | fl Domains` For more information about domains and Microsoft 365 or Office 365 organizations, see Domains FAQ.
Public IP address for the SBC	A public IP address that can be used to connect to the SBC. Based on the type of SBC, the SBC can use NAT.
Fully Qualified Domain Name (FQDN) for the SBC	A FQDN for the SBC, where the domain portion of the FQDN is one of the registered domains in your Microsoft 365 or Office 365 organization. For more information, see SBC domain names.
Public DNS entry for the SBC	A public DNS entry mapping the SBC FQDN to the public IP Address.
Public trusted certificate for the SBC	A certificate for the SBC to be used for all communication with Direct Routing. For more information, see Public trusted certificate for the SBC.
Connection points for Direct Routing	The connection points for Direct Routing are the following three FQDNs: `sip.pstnhub.microsoft.com` – Global FQDN, must be tried first. `sip2.pstnhub.microsoft.com` – Secondary FQDN, geographically maps to the second priority region. `sip3.pstnhub.microsoft.com` – Tertiary FQDN, geographically maps to the third priority region. For information on configuration requirements, see SIP Signaling: FQDNs.

INFRASTRUCTURE REQUIREMENT	YOU NEED THE FOLLOWING
Firewall IP addresses and ports for Direct Routing media	The SBC communicates to the following services in the cloud: SIP Proxy, which handles the signaling Media Processor, which handles media -except when Media Bypass is on These two services have separate IP addresses in Microsoft Cloud, described later in this document. For more information, see the Microsoft Teams section in URLs and IP address ranges.
Media Transport Profile	TCP/RTP/SAVP UDP/RTP/SAVP
Firewall IP addresses and ports for Microsoft Teams media	For more information, see URLs and IP address ranges.

Licensing and other requirements

Users of Direct Routing must have the following licenses assigned in Microsoft 365 or Office 365:

- Microsoft Phone System.
- Microsoft Teams + Skype for Business Plan 2, if included in licensing.
- Microsoft Audio Conferencing (please read the notes and the paragraph below for specific examples about when the license is required).

> **NOTE**
> Skype for Business Plan should not be removed from any licensing agreement where it is included.

> **IMPORTANT**
> In the case that you would like to add external participants to scheduled meetings, either by dialing out to them or by providing the dial-in number, the audio conferencing license is required.

Ad hoc call escalation and Audio Conferencing license

A Teams user can start a one-on-one Teams to PSTN or Teams to Teams call and add a PSTN participant to it. This scenario is called an ad hoc conference. The path that the call takes depends whether the user who escalates the call has a Microsoft Audio Conferencing license assigned or not:

- If the Teams user who escalates the call has a Microsoft Audio Conferencing license assigned, the escalation happens through the Microsoft Audio Conferencing service. The remote PSTN participant who is invited to the existing call receives a notification about the incoming call and sees the number of the Microsoft bridge assigned to the Teams user who initiated the escalation.
- If the Teams user who escalates the call does not have the Microsoft Audio Conferencing license assigned, the escalation happens through a Session Border Controller connected to the Direct Routing interface. The remote PSTN participant who is invited to the call receives a notification about the incoming call and sees the number of the Teams user who initiated the escalation. The specific SBC used for the escalation is defined by Routing Policy of the user.

In addition, you must ensure the following:

- CsOnlineVoiceRoutingPolicy is assigned to the user.
- Allow Private Calling is enabled at the tenant level for Microsoft Teams.

Direct Routing also supports users who are licensed for Microsoft Calling Plan. Microsoft Phone System with Calling Plan can route some calls using the Direct Routing interface. However, the users' phone numbers must be either acquired online or ported to Microsoft.

Mixing Calling Plan and Direct Routing connectivity for the same user is optional, but could be useful (for example, when the user is assigned a Microsoft Calling Plan but wants to route some calls using the SBC). One of the most common scenarios is calls to third-party PBXs. With third-party PBXs, all calls, except calls to the phones connected to that PBXs, are routed using Microsoft Calling Plan, but calls to the phones connected to third-party PBXs go to the SBC, and therefore stay within the enterprise network and not the PSTN.

For more information about Phone System licensing, see Get the most from Office and Plan Options.

For more information about Phone System licensing, see Microsoft Teams add-on licensing.

Supported end points

You can use as an end point:

- Any Teams client.
- Common Area Phones. See Set up the Common Area Phone license for Microsoft Teams. Note you do not need a Calling Plan license when setting up a Common Area Phone with Direct Routing.
- Skype for Business 3PIP phones. See Skype for Business phones (3PIP) support with Microsoft Teams

SBC domain names

The SBC domain name must be from one of the names registered in Domains of the tenant. You cannot use the *.onmicrosoft.com tenant for the FQDN name of the SBC.

The following table shows examples of DNS names registered for the tenant, whether the name can be used as an FQDN for the SBC, and examples of valid FQDN names:

DNS NAME	CAN BE USED FOR SBC FQDN	EXAMPLES OF FQDN NAMES
contoso.com	Yes	**Valid names:** sbc1.contoso.com ssbcs15.contoso.com europe.contoso.com
contoso.onmicrosoft.com	No	Using *.onmicrosoft.com domains is not supported for SBC names

Assume you want to use a new domain name. For example, your tenant has contoso.com as a domain name registered in your tenant, and you want to use sbc1.sip.contoso.com. Before you can pair an SBC with the name sbc1.sip.contoso.com, you must register the domain name sip.contoso.com in Domains in your tenant. If you try pairing an SBC with sbc1.sip.contoso.com before registering the domain name, you will get the following error: "Cannot use the "sbc1.sip.contoso.com" domain as it was not configured for this tenant." After you add the domain name, you also need to create a user with UPN user@sip.contoso.com and assign a Teams license. It might take up to 24 hours to fully provision the domain name after it is added to Domains of your tenant, a user with a new name is created, and a license is assigned to the user.

It is possible that a company might have several SIP address spaces in one tenant. For example, a company might have contoso.com as a SIP address space and fabrikam.com as the second SIP address space. Some users

have address user@contoso.com and some users have address user@fabrikam.com.

The SBC only needs one FQDN and can service users from any address space in the paired tenant. For example, an SBC with the name sbc1.contoso.com can receive and send the PSTN traffic for users with addresses user@contoso.com and user@fabrikam.com as long as these SIP address spaces are registered in the same tenant.

Public trusted certificate for the SBC

Microsoft recommends that you request the certificate for the SBC by generating a certification signing request (CSR). For specific instructions on generating a CSR for an SBC, refer to the interconnection instructions or documentation provided by your SBC vendors.

> **NOTE**
> Most Certificate Authorities (CAs) require the private key size to be at least 2048. Keep this in mind when generating the CSR.

The certificate needs to have the SBC FQDN as the common name (CN) in the subject field.

Alternatively, Direct Routing supports a wildcard in SAN, and the wildcard needs to conform to standard RFC HTTP Over TLS. An example would be using *.contoso.com in the SAN, which would match the SBC FQDN sbc.contoso.com, but wouldn't match with sbc.test.contoso.com.

The certificate needs to be generated by one of the following root certificate authorities:

- AffirmTrust
- AddTrust External CA Root
- Baltimore CyberTrust Root*
- Buypass
- Cybertrust
- Class 3 Public Primary Certification Authority
- Comodo Secure Root CA
- Deutsche Telekom
- DigiCert Global Root CA
- DigiCert High Assurance EV Root CA
- Entrust
- GlobalSign
- Go Daddy
- GeoTrust
- Verisign, Inc.
- SSL.com
- Starfield
- Symantec Enterprise Mobile Root for Microsoft
- SwissSign
- Thawte Timestamping CA
- Trustwave
- TeliaSonera
- T-Systems International GmbH (Deutsche Telekom)
- QuoVadis

For Direct Routing in Office 365 GCCH and DoD environments the certificate needs to be generated by one of the following root certificate authorities:

- DigiCert Global Root CA
- DigiCert High Assurance EV Root CA

> **NOTE**
> *If Mutual TLS (MTLS) support is enabled for the Teams connection on the SBC, then you must install the Baltimore CyberTrust Root Certificate in the SBC Trusted Root Store of the Teams TLS context. (This is because the Microsoft service certificates use the Baltimore root certificate.) To download the Baltimore root certificate, see Office 365 Encryption chains.

Microsoft is working on adding additional certification authorities based on customer requests.

SIP Signaling: FQDNs

Direct Routing is offered in the following environments:

- Microsoft 365 or Office 365
- Office 365 GCC
- Office 365 GCC High
- Office 365 DoD

Learn more about Office 365 and US Government environments such as GCC, GCC High, and DoD.

Microsoft 365, Office 365, and Office 365 GCC environments

The connection points for Direct Routing are the following three FQDNs:

- **sip.pstnhub.microsoft.com** – Global FQDN – must be tried first. When the SBC sends a request to resolve this name, the Microsoft Azure DNS servers return an IP address pointing to the primary Azure datacenter assigned to the SBC. The assignment is based on performance metrics of the datacenters and geographical proximity to the SBC. The IP address returned corresponds to the primary FQDN.
- **sip2.pstnhub.microsoft.com** – Secondary FQDN – geographically maps to the second priority region.
- **sip3.pstnhub.microsoft.com** – Tertiary FQDN – geographically maps to the third priority region.

Placing these three FQDNs in order is required to:

- Provide optimal experience (less loaded and closest to the SBC datacenter assigned by querying the first FQDN).
- Provide failover when connection from an SBC is established to a datacenter that is experiencing a temporary issue. For more information, see Failover mechanism below.

The FQDNs – sip.pstnhub.microsoft.com, sip2.pstnhub.microsoft.com and sip3.pstnhub.microsoft.com – will be resolved to one of the following IP addresses:

- 52.114.148.0
- 52.114.132.46
- 52.114.75.24
- 52.114.76.76
- 52.114.7.24
- 52.114.14.70
- 52.114.16.74
- 52.114.20.29

You need to open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signaling. If your firewall supports DNS names, the FQDN **sip-all.pstnhub.microsoft.com** resolves to all these IP addresses.

> **IMPORTANT**
>
> As part of Teams Direct Routing expansion and service improvement we have deployed new instances of Direct Routing infrastructure in Australia. This is reflected in two additional IP addresses (52.114.16.74 and 52.114.20.29) to which following FQDNs will be resolved for Australian customers – sip.pstnhub.microsoft.com, sip2.pstnhub.microsoft.com and sip3.pstnhub.microsoft.com. You need to add these two IP addresses (52.114.16.74 and 52.114.20.29) to your IP Access Control Lists (ACLs) and open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signalling.

Office 365 GCCH and DoD environment

The connection point for Direct Routing is the following FQDN:

sip.pstnhub.dod.teams.microsoft.us – Global FQDN. As the Office 365 DoD environment exists only in the US data centers, there is no secondary and tertiary FQDNs.

The FQDN sip.pstnhub.dod.teams.microsoft.us will be resolved to one of the following IP addresses:

- 52.127.64.33
- 52.127.68.34

You need to open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signaling.

Office 365 GCC High environment

The connection point for Direct Routing is the following FQDN:

sip.pstnhub.gov.teams.microsoft.us – Global FQDN. As the GCC High environment exists only in the US data centers, there is no secondary and tertiary FQDNs.

The FQDN sip.pstnhub.gov.teams.microsoft.us will be resolved to one of the following IP addresses:

- 52.127.88.59
- 52.127.92.64

You need to open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signaling. If your firewall supports DNS names, the FQDN **sip-all.pstnhub.gov.teams.microsoft.us** resolves to all these IP addresses. This FQDN can also be used as Federated FQDN for inbound call classification.

SIP Signaling: Ports

You must use the following ports for Microsoft 365 or Office 365 environments where Direct Routing is offered:

- Microsoft 365 or Office 365
- Office 365 GCC
- Office 365 GCC High
- Office 365 DoD

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT
SIP/TLS	SIP Proxy	SBC	1024 – 65535	Defined on the SBC (For Office 365 GCC High/DoD only port 5061 must be used)
SIP/TLS	SBC	SIP Proxy	Defined on the SBC	5061

Failover mechanism for SIP Signaling

The SBC makes a DNS query to resolve sip.pstnhub.microsoft.com. Based on the SBC location and the datacenter performance metrics, the primary datacenter is selected. If the primary datacenter experiences an issue, the SBC will try the sip2.pstnhub.microsoft.com, which resolves to the second assigned datacenter, and, in the rare case that datacenters in two regions are not available, the SBC retries the last FQDN (sip3.pstnhub.microsoft.com), which provides the tertiary datacenter IP.

The table below summarizes the relationships between primary, secondary, and tertiary datacenters:

IF THE PRIMARY DATACENTER IS	EMEA	NOAM	ASIA
The secondary datacenter (sip2.pstnhub.microsoft.com)	US	EU	US
The tertiary datacenter (sip3.pstnhub.microsoft.com)	ASIA	ASIA	EU

Media traffic: Port ranges

Note that the requirements below apply if you want to deploy Direct Routing without Media Bypass. For firewall requirements for Media Bypass, please refer to Plan for media bypass with Direct Routing.

The media traffic flows to and from a separate service in the Microsoft Cloud. The IP address ranges for Media traffic are as follows.

Microsoft 365, Office 365, and Office 365 GCC environments

- 52.112.0.0/14 (IP addresses from 52.112.0.1 to 52.115.255.254).
- 52.120.0.0/14 (IP addresses from 52.120.0.1 to 52.123.255.254).

Office 365 DoD environment

- 52.127.64.0/21

Office 365 GCC High environment

- 52.127.88.0/21

Port range (applicable to all environments)

The port range of the Media Processors is shown in the following table:

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT
UDP/SRTP	Media Processor	SBC	3478-3481 and 49152 – 53247	Defined on the SBC
UDP/SRTP	SBC	Media Processor	Defined on the SBC	3478-3481 and 49152 – 53247

> **NOTE**
> Microsoft recommends at least two ports per concurrent call on the SBC.

Media traffic: Media processors geography

The media traffic flows via components called media processors. Media processors are placed in the same datacenters as SIP proxies. Also, there are additional media processors to optimize media flow. For example, we do not have a SIP proxy component now in Australia (SIP flows via Singapore or Hong Kong) but we do have the media processor locally in Australia. The need for the media processors locally is dictated by the latency which we experience by sending traffic long-distance, for example from Australia to Singapore or Hong Kong. While latency in the example of traffic flowing from Australia to Hong Kong or Singapore is acceptable to preserve good call quality for SIP traffic, for real-time media traffic it is not.

Location of the media processors:

Locations where both SIP proxy and media processor components deployed:

- US (two in US West and US East datacenters)
- Europe (Amsterdam and Dublin datacenters)
- Asia (Singapore and Hong Kong datacenters)

Locations where only media processors are deployed (SIP flows via the closest datacenter listed above):

- Japan (JP East and West datacenters)
- Australia (AU East and Southeast datacenters)

Media traffic: Codecs

Leg between SBC and Cloud Media Processor or Microsoft Teams client.

Applies to both media bypass case and non-bypass cases.

The Direct Routing interface on the leg between the Session Border Controller and Cloud Media Processor (without media bypass) or between the Teams client and the SBC (if Media Bypass enabled) can use the following codecs:

- Non-Media bypass (SBC to Cloud Media Processor): SILK, G.711, G.722, G.729
- Media Bypass (SBC to Teams client): SILK, G.711, G.722, G.729

You can force use of the specific codec on the Session Border Controller by excluding undesirable codecs from the offer.

Leg between Microsoft Teams Client and Cloud Media Processor

Applies to non-media bypass case only. With Media Bypass, the media flows directly between the Teams client and the SBC.

On the leg between the Cloud Media Processor and Microsoft Teams client either SILK or G.722 is used. The

codec choice on this leg is based on Microsoft algorithms, which take into consideration multiple parameters.

Supported Session Border Controllers (SBCs)

Microsoft only supports certified SBCs to pair with Direct Routing. Because Enterprise Voice is critical for businesses, Microsoft runs intensive tests with the selected SBCs, and works with the SBC vendors to ensure the two systems are compatible.

Devices that have been validated are listed as Certified for Teams Direct Routing. The certified devices are guaranteed to work in all scenarios.

For more information about supported SBCs, see List of Session Border Controllers certified for Direct Routing.

See also

Configure Direct Routing

List of Session Border Controllers certified for Direct Routing

12/5/2020 • 4 minutes to read • Edit Online

Microsoft partners with selected Session Border Controllers (SBC) vendors to certify that their SBCs work with Direct Routing.

Microsoft works with each vendor to:

- Jointly work on the SIP interconnection protocols.
- Perform intense tests using a third-party lab. Only devices that pass the tests are certified.
- Run daily tests with all certified devices in production and pre-production environments. Validating the devices in pre-production environments guarantees that new versions of Direct Routing code in the cloud will work with certified SBCs.
- Establish a joint support process with the SBC vendors.

> **NOTE**
> Microsoft only supports Phone System if a certified device or devices are connected through Direct Routing. Microsoft reserves the right to reject support cases where a non-certified device is connected to the Phone System through Direct Routing. If Microsoft determines that a customer's Direct Routing issue is with a vendor's SBC device, the customer will need to engage the SBC vendor for support.

The table below lists devices certified for Direct Routing. (For information about which SBC vendors support Local Media Optimization, see Configure Local Media Optimization for Direct Routing.)

Learn more about Direct Routing. If you have any questions about the SBC certification program for Direct Routing, please contact drsbccertification@microsoft.com.

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
Audiocodes	Mediant 500 SBC	✔	✔	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	Mediant 800 SBC	✔	✔	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	Mediant 2600 SBC	✔	✔	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	Mediant 4000 SBC	✔	✔	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	Mediant 1000B SBC	✔	Pending	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	Mediant 9000 SBC	✔	✔	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	Virtual Edition SBC	✔	✔	Supported 7.20A.250 (Recommended 7.20A.258)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
Ribbon Communications	SBC 5100/5110	✔	✔	Supported 7.2 (Recommended 8.2)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	SBC 5200/5210	✔	✔	Supported 7.2 (Recommended 8.2)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	
	SBC 5400	✔	✔	Supported 7.2 (Recommended 8.2)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	SBC 7000	✔	✔	Supported 7.2 (Recommended 8.2)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	
	SBC SWe	✔	✔	Supported 7.2 (Recommended 8.2)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	SBC 1000	✔	✔	8.x or 9.x	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	SBC 2000	✔	✔	8.x or 9.x	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	SBC SWe Lite	✔	✔	8.x or 9.x	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	EdgeMarc Series	✔		15.6.1		
Thinktel	Think 365 SBC	✔		1.4		
Oracle	AP 1100	✔	✔	8.3.0.0.1	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	AP 3900	✔	✔	8.3.0.0.1	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	AP 4600	✔	✔	8.3.0.0.1	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	AP 6300	✔	✔	8.3.0.0.1	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
	AP 6350	✔	✔	8.3.0.0.1	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	VME	✔	✔	8.3.0.0.1	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	✔
TE-SYSTEMS	anynode	✔	✔	Supported 3.20 (Recommended 4.0)	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	
Metaswitch	Perimeta SBC	✔		4.7		

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
Cisco	Cisco Unified Border Element (CUBE) for 1000 Series Integrated Services Routers	✔		IOS XE Amsterdam 17.2.1r	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	
	Cisco Unified Border Element (CUBE) for 4000 Series Integrated Services Routers	✔		IOS XE Amsterdam 17.2.1r	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
	Cisco Unified Border Element (CUBE) for 1000V Series Cloud Services Router	✔		IOS XE Amsterdam 17.2.1r	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	
	Cisco Unified Border Element (CUBE) for 1000 Series Aggregation Services Routers	✔		IOS XE Amsterdam 17.2.1r	• Bandwidth Dynamic Location Routing • Intrado Emergency Routing Service (ERS) • Intrado Emergency Gateway (EGW)	
Avaya	Avaya Session Border Controller for Enterprise (ASBCE)	✔		Release 8.1.1		

VENDOR	PRODUCT	NON-MEDIA BYPASS	MEDIA BYPASS	SOFTWARE VERSION	VALIDATED WITH E911 PROVIDERS	ELIN CAPABLE
Nokia	Nokia Session Border Controller	✔		19.5 (1908)		
Italtel	NetMatch-S CI	✔		5.0		
Ericsson	vSBC 2.16	✔				

The following table lists devices that are verified for interoperability between Direct Routing and Analog Devices.

VENDOR	PRODUCT	VERIFIED
Audiocodes	ATA-1	✔
Audiocodes	ATA-2	✔
Ribbon	SBC 1000. Software version: 8.1.1 (build 527)	✔
Ribbon	SBC 2000. Software version: 8.1.1 (build 527)	✔
Oracle	AP1100 Software Version 8.3.0.1.2	✔
Oracle	AP3900 Software Version 8.3.0.1.2	✔
Oracle	AP4600 Software Version 8.3.0.1.2	✔
Oracle	AP6300 Software Version 8.3.0.1.2	✔
Oracle	AP6350 Software Version 8.3.0.1.2	✔
Oracle	VME Software Version 8.3.0.1.2	✔
TE-SYSTEMS	anynode with Grandstream GXW42xx (V1.0.7.10)	✔

To give us product feedback about Teams, such as ideas for new features, see Uservoice. Note the certification granted to a major version. That means that firmware with any number in the SBC firmware following the major version is supported.

Configure Direct Routing

12/5/2020 • 2 minutes to read • Edit Online

Microsoft Phone System Direct Routing enables you to connect your on-premises telephony infrastructure to Microsoft Teams. The article lists the high-level steps required for connecting a supported on-premises Session Border Controller (SBC) to Direct Routing, and how to configure Teams users to use Direct Routing to connect to the Public Switched Telephone Network (PSTN). This article links to associated articles for details.

For information about whether Direct Routing is the right solution for your organization, see Phone System Direct Routing. For information about prerequisites and planning your deployment, see Plan Direct Routing.

> **TIP**
> You can also watch the following session to learn about the benefits of Direct Routing, how to plan for it, and how to deploy it: Direct Routing in Microsoft Teams.

To complete the steps explained in this article, administrators need some familiarity with PowerShell cmdlets. For more information about using PowerShell, see Set up your computer for Windows PowerShell.

Before performing the steps in these articles, Microsoft recommends that you confirm that your SBC has already been configured as recommended by your SBC vendor:

- AudioCodes deployment documentation
- Oracle deployment documentation
- Ribbon Communications deployment documentation
- TE-Systems (anynode) deployment documentation
- Metaswitch deployment documentation

For a complete list of supported SBCs, see List of Session Border Controllers certified for Direct Routing.

To configure Microsoft Phone System and enable users to use Direct Routing, follow these steps:

- **Step 1.** Connect the SBC with Microsoft Phone System and validate the connection
- **Step 2.** Enable users for Direct Routing, voice, and voicemail
- **Step 3.** Configure voice routing
- **Step 4.** Translate numbers to an alternate format

If you are configuring an SBC for multiple tenants, you'll also want to read Configure an SBC for multiple tenants.

Related topics

Phone System Direct Routing

Plan Direct Routing

Connect your Session Border Controller (SBC) to Direct Routing

7/7/2020 • 8 minutes to read • Edit Online

This article describes how to configure a Session Border Controller (SBC) and connect it to Phone System Direct Routing. This is step 1 of the following steps to configure Direct Routing:

- **Step 1. Connect your SBC with Phone System and validate the connection** (This article)
- Step 2. Enable users for Direct Routing
- Step 3. Configure call routing
- Step 4. Translate numbers to an alternate format

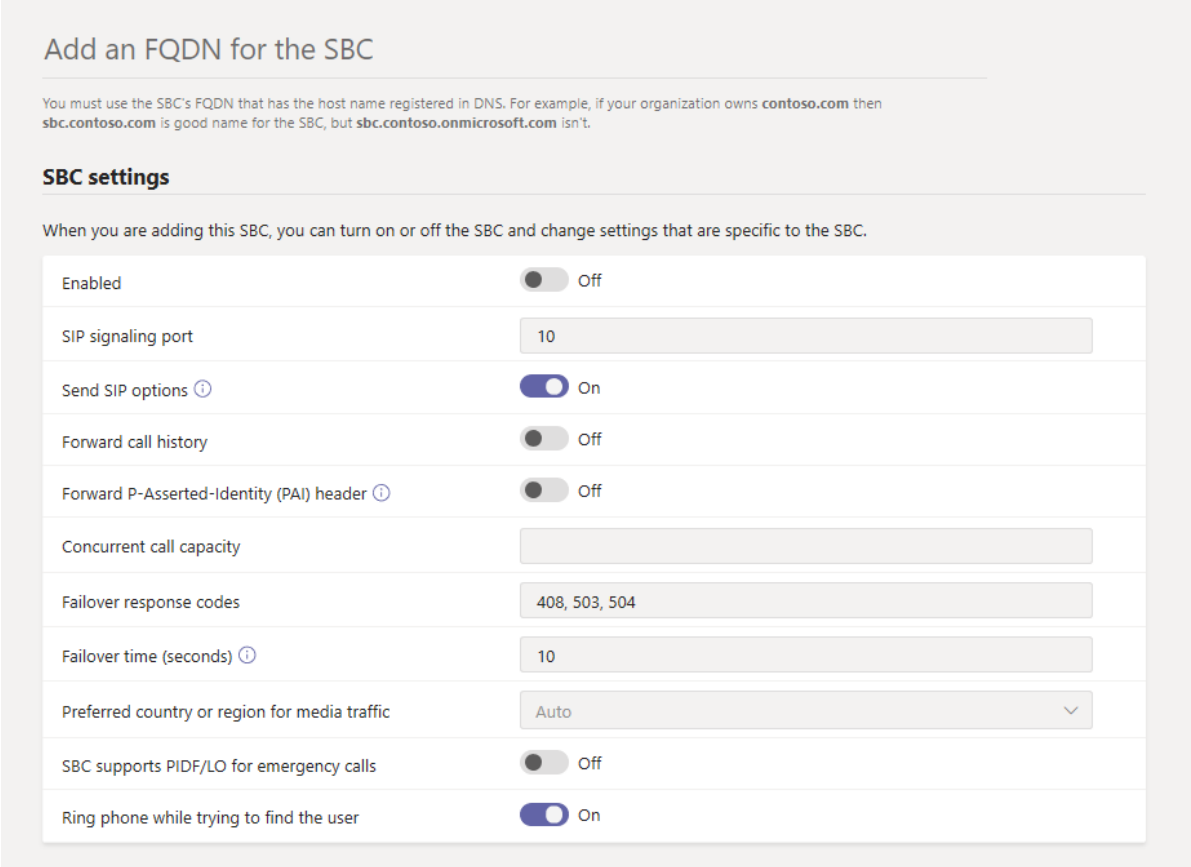
For information on all the steps required to set up Direct Routing, see Configure Direct Routing.

You can use the Microsoft Teams admin center or PowerShell to configure and connect an SBC to Direct Routing.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Voice** > **Direct Routing**, and then click the **SBCs** tab.
2. Click **Add**.
3. Enter a FQDN for the SBC.

   Make sure the domain name portion of the FQDN matches a domain that's registered in your tenant and keep in mind that the `*.onmicrosoft.com` domain name isn't supported for the SBC FQDN domain name. For example, if you have two domain names, `contoso.com` and `contoso.onmicrosoft.com`, use `sbc.contoso.com` as the SBC name.
4. Configure the following settings for the SBC, based on your organization's needs. For details on each of these settings, see SBC settings.



5. When you're done, click **Save**.

Using PowerShell

To connect your SBC to Direct Routing, you'll need to:

1. Connect to Skype for Business Online by using PowerShell.
2. Connect the SBC to the tenant.
3. Verify the SBC connection.

Connect to Skype for Business Online by using PowerShell

You can use a PowerShell session connected to the tenant to pair the SBC to the Direct Routing interface. To open a PowerShell session, follow the steps outlined in Set up your computer for Windows PowerShell.

After you establish a remote PowerShell session, verify that you can see the commands to manage the SBC. To verify the commands, type or copy and paste the following command in the PowerShell session, and then press Enter:

```
Get-Command *onlinePSTNGateway*
```

The command returns the four functions shown here that will let you manage the SBC.

```
CommandType     Name                       Version    Source
-----------     ----                       -------    ------
Function        Get-CsOnlinePSTNGateway    1.0        tmp_v5fiu1no.wxt
Function        New-CsOnlinePSTNGateway    1.0        tmp_v5fiu1no.wxt
Function        Remove-CsOnlinePSTNGateway 1.0        tmp_v5fiu1no.wxt
Function        Set-CsOnlinePSTNGateway    1.0        tmp_v5fiu1no.wxt
```

Connect the SBC to the tenant

Use the New-CsOnlinePSTNGateway cmdlet to connect the SBC to the tenant. In a PowerShell session, type the following, and then press Enter:

```
New-CsOnlinePSTNGateway -Fqdn <SBC FQDN> -SipSignalingPort <SBC SIP Port> -MaxConcurrentSessions <Max
Concurrent Sessions the SBC can handle> -Enabled $true
```

NOTE

1. We recommend that you set a maximum call limit in the SBC using information that can be found in the SBC documentation. The limit will trigger a notification if the SBC is at the capacity level.
2. You can only connect the SBC if the domain portion of its FQDN matches one of the domains registered in your tenant, except *.onmicrosoft.com. Using *.onmicrosoft.com domain names is not supported for the SBC FQDN name. For example, if you have two domain names, **contoso**.com and **contoso**.onmicrosoft.com, you can use sbc.contoso.con for the SBC name. If you try to connect the SBC with a name such as sbc.contoso.abc, the system won't let you, as the domain is not owned by this tenant.
   In addition to the domain registered in your tenant, it's important that there's a user with that domain and an assigned E3 or E5 license. If not, you'll receive the following error:
   `Can not use the "sbc.contoso.com" domain as it was not configured for this tenant`.

Here's an example:

```
New-CsOnlinePSTNGateway -Identity sbc.contoso.com -Enabled $true -SipSignalingPort 5067 -MaxConcurrentSessions
100
```

Which returns:

```
Identity              : sbc.contoso.com
Fqdn                  : sbc.contoso.com
SipSignalingPort     : 5067
FailoverTimeSeconds   : 10
ForwardCallHistory    : False
ForwardPai            : False
SendSipOptions        : True
MaxConcurrentSessions : 100
Enabled               : True
```

NOTE

This example shows only the minimum required parameters. There are additional parameters that you can set with the New-CsOnlinePSTNGateway cmdlet during the connection process. To learn more, see SBC settings.

Verify the SBC connection

To verify the connection:

- Check whether the SBC is on the list of paired SBCs.
- Validate SIP options.

Check whether the SBC is on the list of paired SBCs

After you connect the SBC, use the Get-CsOnlinePSTNGateway cmdlet to verify that the SBC is present in the list of paired SBCs. Type the following in a remote PowerShell session, and then press Enter:

```
Get-CsOnlinePSTNGateway -Identity sbc.contoso.com
```

The paired gateway should appear in the list as shown in the example below, and the **Enabled** parameter should display a value of **True**.

Which returns:

```
Identity              : sbc.contoso.com
Fqdn                  : sbc.contoso.com
SipSignalingPort     : 5067
CodecPriority         : SILKWB,SILKNB,PCMU,PCMA
ExcludedCodecs        :
FailoverTimeSeconds   : 10
ForwardCallHistory    : False
ForwardPai            : False
SendSipOptions        : True
MaxConcurrentSessions : 100
Enabled               : True
```

Validate SIP options

To validate the pairing using outgoing SIP options, use the SBC management interface and confirm that the SBC receives 200 OK responses to its outgoing OPTIONS messages.

When Direct Routing sees incoming OPTIONS, it will start sending outgoing SIP Options messages to the SBC FQDN configured in the Contact header field in the incoming OPTIONS message.

To validate the pairing using incoming SIP options, use the SBC management interface and see that the SBC sends a reply to the OPTIONS messages coming in from Direct Routing and that the response code it sends is 200 OK.

SBC settings

This table lists the options that you can set for the SBC in the Microsoft Teams admin center and by using the New-CsOnlinePSTNGateway cmdlet.

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
Yes	**Add an FQDN for the SBC**	FQDN	None	FQDN name, limit 63 characters	String, see the list of allowed and disallowed characters on Naming conventions in Active Directory for computers, domains, sites, and OUs	

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	**Enabled**	Enabled	Use to turn on the SBC for outbound calls. You can use this to temporarily remove the SBC from service while it's being updated or during maintenance.	False	True False	Boolean
Yes	**SIP signaling port**	SipSignalingPort	This is the listening port that's used to communicate with Direct Routing by using the Transport Layer (TLS) protocol.	None	Any port	0 to 65535
No	**Send SIP options**	SendSIPOptions	Defines whether the SBC will send SIP options messages. We highly recommend that you turn on this setting. When this setting is off, the SBC is excluded from the Monitoring and Alert system.	True	True False	Boolean

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	**Forward call history**	ForwardCallHistory	Indicates whether call history information is forwarded through the trunk. When you turn this on, the Microsoft 365 or Office 365 proxy sends a History-info and Referred-by header.	False	True False	Boolean
No	**Forward P-Asserted-identity (PAI) header**	ForwardPAI	Indicates whether the PAI header is forwarded along with the call. The PAI header provides a way to verify the identity of the caller. If this setting is on, the Privacy:ID header is also sent.	False	True False	Boolean
No	**Concurrent call capacity**	MaxConcurrentSessions	When you set a value, the alerting system will notify you when the number of concurrent sessions is 90 percent or higher than this value. If you don't set a value, alerts aren't generated. However, the monitoring system will report the number of concurrent sessions every 24 hours.	Null	Null 1 to 100,000	

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	**Failover response codes**	FailoverResponseCodes	If Direct Routing receives any 4xx or 6xx SIP error code in response to an outgoing Invite, the call is considered completed by default. Outgoing means a call from a Teams client to the PSTN with traffic flow: Teams client -> Direct Routing -> SBC -> telephony network). When you specify a failover response code, this forces Direct Routing to try another SBC (if another SBC exists in the voice routing policy of the user) when it receives the specified codes if the SBC can't make a call because of network or other issues. To learn more, see Failover of specific SIP codes received from the Session Border Controller (SBC).	408, 503, 504		Int

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	**Failover times (seconds)**	FailoverTimeSeconds	When you set a value, outbound calls that aren't answered by the gateway within the time that you set are routed to the next available trunk. If there are no additional trunks, the call is automatically dropped. The default value is 10 seconds. In an organization with slow networks and gateway responses, this could potentially result in calls being dropped unnecessarily.	10	Number	Int

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	**Preferred country or region for media traffic**	MediaRelayRoutingLocationOverride	Use to manually set your preferred country or region for media traffic. We recommend that you set this only if the call logs clearly indicate that the default assignment of the datacenter for the media path doesn't use the path closest to the SBC datacenter. By default, Direct Routing assigns a datacenter based on the public IP address of the SBC, and always selects the path closest to the SBC datacenter. However, in some cases, the default path might not be the optimal path. This parameter allows you to manually set the preferred region for media traffic.	None	Country codes in ISO format	

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	**SBC supports PIDF/LO for emergency calls**	PidfloSupported	Specify whether the SBC supports Presence Information Data Format Location Object (PIDF/LO) for emergency calls.			
No	**Ring phone while trying to find the user**	GenerateRingingWhileLocatingUser	Set whether an audio signal is played to the caller to indicate that Teams is in the process of establishing the call. This setting only applies to Direct Routing in non-media bypass mode. Sometimes inbound calls from the PSTN to Teams clients can take longer than expected to be established. When this happens, the caller might not hear anything, the Teams client doesn't ring, and the call might be canceled by some telecommunications providers. This setting helps to avoid unexpected silences that can occur in these scenarios.	True	True False	Boolean

REQUIRED?	MICROSOFT TEAMS ADMIN CENTER SETTING	POWERSHELL PARAMETER	DESCRIPTION	DEFAULT	POSSIBLE VALUES	TYPE AND RESTRICTIONS
No	-	MediaBypass	This setting indicates whether the SBC supports media bypass and whether you want to use it for this SBC.	None	True False	Boolean

See also

Plan Direct Routing

Configure Direct Routing

Teams PowerShell overview

Enable users for Direct Routing, voice, and voicemail

11/2/2020 • 4 minutes to read • Edit Online

This article describes how to enable users for Phone System Direct Routing. This is step 2 of the following steps for configuring Direct Routing:

- Step 1. Connect the SBC with Microsoft Phone System and validate the connection
- **Step 2. Enable users for Direct Routing, voice, and voicemail** (this article)
- Step 3. Configure voice routing
- Step 4. Translate numbers to an alternate format

For information on all the steps required for setting up Direct Routing, see Configure Direct Routing.

When you are ready to enable users for Direct Routing, follow these steps:

1. Create a user in Microsoft 365 or Office 365 and assign a Phone System license.
2. Ensure that the user is homed in Skype for Business Online.
3. Configure the phone number and enable enterprise voice and voicemail.
4. Assign Teams Only mode to users.

Create a user and assign the license

There are two options for creating a new user in Microsoft 365 or Office 365. However, Microsoft recommends that your organization choose one option to avoid routing issues:

- Create the user in on-premises Active Directory and sync the user to the cloud. See Integrate your on-premises directories with Azure Active Directory.
- Create the user directly in the Microsoft 365 admin center. See Add users individually or in bulk to Microsoft 365 or Office 365 - Admin Help.

If your Skype for Business Online deployment coexists with Skype for Business 2015 or Lync 2010 or 2013 on-premises, the only supported option is to create the user in the on-premises Active Directory and sync the user to the cloud (Option 1).

For information about license requirements, see licensing and other requirements in Plan Direct Routing.

Ensure that the user is homed online and phone number is not being synced from on-premises (applicable for Skype for Business Server Enterprise Voice enabled users being migrated to Teams Direct Routing)

Direct Routing requires the user to be homed online. You can check by looking at the RegistrarPool parameter, which needs to have a value in the infra.lync.com domain. OnPremLineUriManuallySet parameter should also to be set to True. This is achieved by configuring the phone number and enable enterprise voice and voicemail using Skype for Business Online PowerShell.

1. Connect a Skype for Business Online PowerShell session.
2. Issue the command:

```
Get-CsOnlineUser -Identity "<User name>" | fl
RegistrarPool,OnPremLineUriManuallySet,OnPremLineUri,LineUri
```

In case OnPremLineUriManuallySet is set to False and LineUri is populated with a <E.164 phone number>, please clean the parameters using on-premises Skype for Business Management Shell, before configuring the phone number using Skype for Business Online PowerShell.

3. From Skype for Business Management Shell issue the command:

```
Set-CsUser -Identity "<User name>" -LineUri $null -EnterpriseVoiceEnabled $False -HostedVoiceMail
$False
```

After the changes have synced to Office 365 the expected output of

```
Get-CsOnlineUser -Identity "<User name>" | fl
RegistrarPool,OnPremLineUriManuallySet,OnPremLineUri,LineUri
```

would be:

```
RegistrarPool                       : pool.infra.lync.com
OnPremLineURIManuallySet            : True
OnPremLineURI                       :
LineURI                             :
```

Configure the phone number and enable enterprise voice and voicemail

After you have created the user and assigned a license, the next step is to configure the user's phone number and voicemail.

To add the phone number and enable for voicemail:

1. Connect a Skype for Business Online PowerShell session.
2. Issue the command:

```
Set-CsUser -Identity "<User name>" -EnterpriseVoiceEnabled $true -HostedVoiceMail $true -OnPremLineURI
tel:<phone number>
```

For example, to add a phone number for user "Spencer Low," enter the following:

```
Set-CsUser -Identity "spencer.low@contoso.com" -OnPremLineURI tel:+14255388797 -EnterpriseVoiceEnabled
$true -HostedVoiceMail $true
```

If the users "Spencer Low" and "Stacy Quinn" share the same base number with unique extensions, enter the following

```
Set-CsUser -Identity "spencer.low@contoso.com" -OnPremLineURI tel:+14255388701;ext=1001 -
EnterpriseVoiceEnabled $true -HostedVoiceMail $true
Set-CsUser -Identity "stacy.quinn@contoso.com" -OnPremLineURI tel:+14255388701;ext=1002 -
EnterpriseVoiceEnabled $true -HostedVoiceMail $true
```

It's recommended, but not required, that the phone number used is configured as a full E.164 phone number with country code. It is supported to configure phone numbers with extensions which will be used to lookup users when the lookup against the base number returns more than one result. This allows

companies to configure phone numbers with the same base number and unique extensions. For lookup to be successful, the invite must include the full number with extension as follows:

```
To: <sip:+14255388701;ext=1001@sbc1.adatum.biz
```

> **NOTE**
> If the user's phone number is managed on premises, use on-premises Skype for Business Management Shell or Control Panel to configure the user's phone number.

Configuring sending calls directly to voicemail

Direct Routing allows you to end the call to a user and send it directly to the user's voicemail. If you want to send the call directly to voicemail, attach opaque=app:voicemail to the Request URI header. For example, "sip:user@yourdomain.com;opaque=app:voicemail". In this case, the Teams user will not receive the calling notification, the call will be connected to the voicemail of the user directly.

Assign Teams Only mode to users to ensure calls land in Microsoft Teams

Direct Routing requires that users be in Teams Only mode to ensure incoming calls land in the Teams client. To put users in Teams Only mode, assign them the "UpgradeToTeams" instance of TeamsUpgradePolicy. For more information, see Upgrade guidance for IT administrators. If your organization uses Skype for Business Server or Skype for Business Online, see the following article for information about interoperability between Skype and Teams: Migration and interoperability with Skype for Business.

See also

Plan Direct Routing

Configure Direct Routing

Configure voice routing for Direct Routing

12/5/2020 • 15 minutes to read • Edit Online

This article describes how to configure voice routing for Phone System Direct Routing. This is step 3 of the following steps for configuring Direct Routing:

- Step 1. Connect the SBC with Microsoft Phone System and validate the connection
- Step 2. Enable users for Direct Routing, voice, and voicemail
- **Step 3. Configure voice routing** (This article)
- Step 4. Translate numbers to an alternate format

For information on all the steps required for setting up Direct Routing, see Configure Direct Routing.

Voice routing overview

Microsoft Phone System has a routing mechanism that allows a call to be sent to a specific Session Border Controller (SBC) based on:

- The called number pattern
- The called number pattern plus the specific user who makes the call

SBCs can be designated as active and backup. When the SBC that is configured as active is not available for a specific call route, then the call will be routed to a backup SBC.

Voice routing is made up of the following elements:

- **Voice routing policy** – A container for PSTN usages, which can be assigned to a user or to multiple users.
- **PSTN usages** – A container for voice routes and PSTN usages, which can be shared in different voice routing policies.
- **Voice routes** – A number pattern and set of online PSTN gateways to use for calls where the calling number matches the pattern.
- **Online PSTN gateway** - A pointer to an SBC that also stores the configuration that is applied when a call is placed through the SBC, such as forward P-Asserted-Identity (PAI) or Preferred Codecs; can be added to voice routes.

Voice routing policy considerations

If a user has a Calling Plan license, that user's outgoing calls are automatically routed through the Microsoft Calling Plan PSTN infrastructure. If you configure and assign an online voice routing policy to a Calling Plan user, that user's outgoing calls are checked to determine whether the dialed number matches a number pattern defined in the online voice routing policy. If there's a match, the call is routed through the Direct Routing trunk. If there's no match, the call is routed through the Calling Plan PSTN infrastructure.

Caution

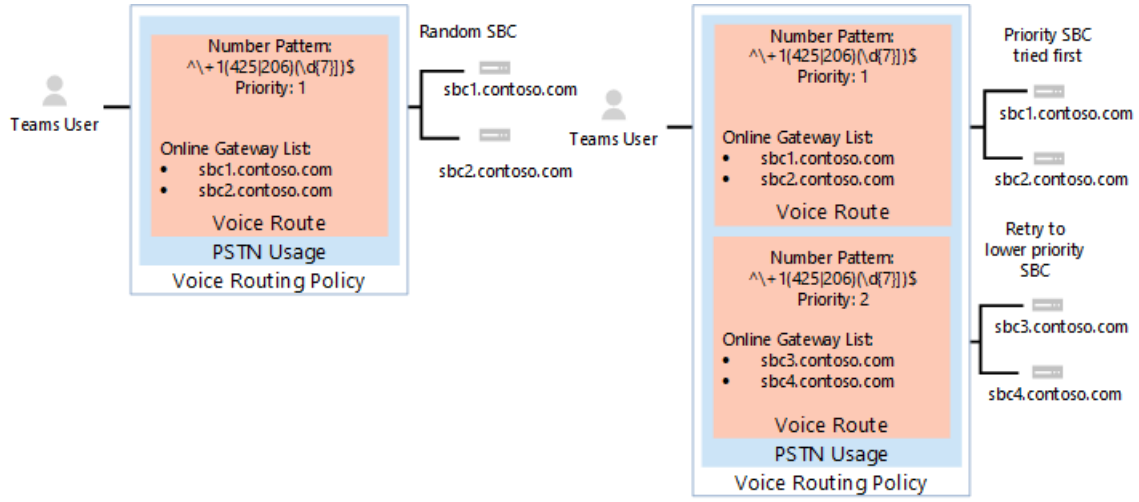
If you configure and apply the global (Org-wide default) online voice routing policy, all voice-enabled users in your organization will inherit that policy, which may result in PSTN calls from Calling Plan users being inadvertently routed to a Direct Routing trunk. If you don't want all users to use the global online voice routing policy, configure a custom online voice routing policy and assign it to individual voice-enabled users.

Example 1: Voice routing with one PSTN usage

The following diagram shows two examples of voice routing policies in a call flow.

Call Flow 1 (on the left): If a user makes a call to +1 425 XXX XX XX or +1 206 XXX XX XX, the call is routed to SBC sbc1.contoso.biz or sbc2.contoso.biz. If neither sbc1.contoso.biz nor sbc2.contoso.biz are available, the call is dropped.

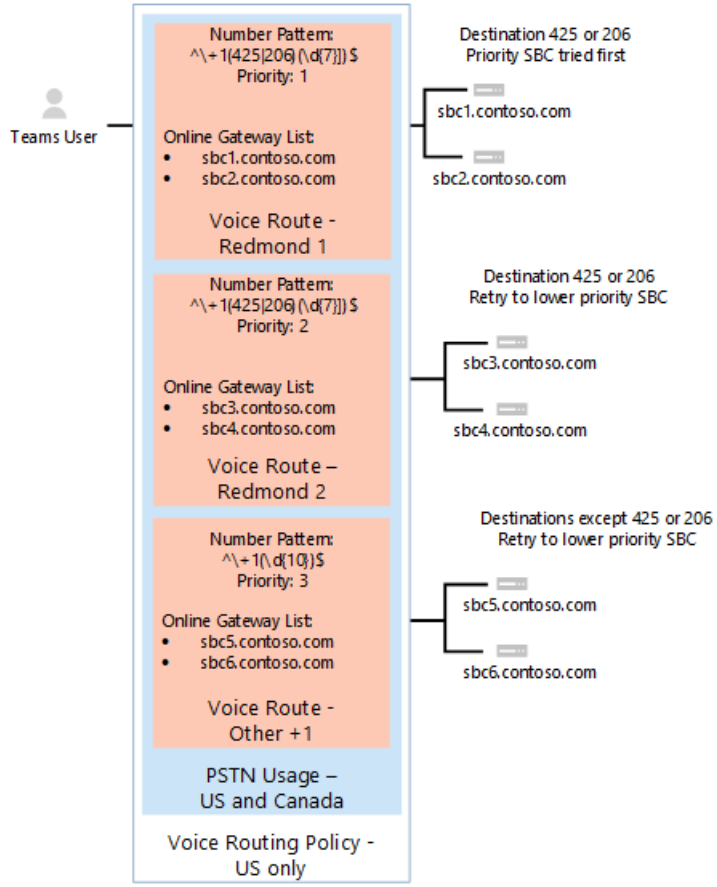
Call Flow 2 (on the right): If a user makes a call to +1 425 XXX XX XX or +1 206 XXX XX XX, the call is first routed to SBC sbc1.contoso.biz or sbc2.contoso.biz. If neither SBC is available, the route with lower priority will be tried (sbc3.contoso.biz and sbc4.contoso.biz). If none of the SBCs are available, the call is dropped.



In both examples, while the voice route is assigned priorities, the SBCs in the routes are tried in random order. When two SBC's are configured in one route, network traffic must be routable between both SBC's or media will fail to be established on transfers as it is possible that the new invite for the transfer will be sent to a different SBC in the route.

> **NOTE**
>
> Unless the user also has a Microsoft Calling Plan license, calls to any number except numbers matching the patterns +1 425 XXX XX XX or +1 206 XXX XX XX in the example configuration are dropped. If the user has a Calling Plan license, the call is automatically routed according to the policies of the Microsoft Calling Plan. The Microsoft Calling Plan applies automatically as the last route to all users with the Microsoft Calling Plan license and does not require additional call routing configuration.

In the example shown in the following diagram, a voice route is added to send calls to all other US and Canadian numbers (calls that go to called number pattern +1 XXX XXX XX XX).



For all other calls, if a user has both licenses (Microsoft Phone System and Microsoft Calling Plan), the automatic route is used. If nothing matches the number patterns in the administrator-created online voice routes, then the call is routed through Microsoft Calling Plan. If the user only has Microsoft Phone System, the call is dropped because no matching rules are available.

> **NOTE**
>
> The Priority value for route "Other +1" doesn't matter in this case because there is only one route that matches the pattern +1 XXX XXX XX XX. If a user makes a call to +1 324 567 89 89 and both sbc5.contoso.biz and sbc6.contoso.biz are unavailable, the call is dropped.

The following table summarizes the configuration using three voice routes. In this example, all three routes are part of the same PSTN usage, "US and Canada". All routes are associated with the "US and Canada" PSTN usage and the PSTN usage is associated with the "US Only" voice routing policy.

PSTN USAGE	VOICE ROUTE	NUMBER PATTERN	PRIORITY	SBC	DESCRIPTION
US and Canada	"Redmond 1"	^\+1(425|206)(\d{7})$	1	sbc1.contoso.biz sbc2.contoso.biz	Active route for called numbers +1 425 XXX XX XX or +1 206 XXX XX XX
US and Canada	"Redmond 2"	^\+1(425|206)(\d{7})$	2	sbc3.contoso.biz sbc4.contoso.biz	Backup route for called numbers +1 425 XXX XX XX or +1 206 XXX XX XX

PSTN USAGE	VOICE ROUTE	NUMBER PATTERN	PRIORITY	SBC	DESCRIPTION
US and Canada	"Other +1"	^\+1(\d{10})$	3	sbc5.contoso.biz sbc6.contoso.biz	Route for called numbers +1 XXX XXX XX XX (except +1 425 XXX XX XX or +1 206 XXX XX XX)

Example 1: Configuration steps

The following example shows how to:

1. Create a single PSTN usage.
2. Configure three voice routes.
3. Create a voice routing policy.
4. Assign the policy to a user named Spencer Low.

You can use the Microsoft Teams admin center or PowerShell to perform these steps.

Using the Microsoft Teams admin center

Step 1: Create the "US and Canada" PSTN usage

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Direct Routing**, and then in the upper-right corner, select **Manage PSTN usage records**.
2. Click **Add**, type **US and Canada**, and then click **Apply**.

Step 2: Create three voice routes (Redmond 1, Redmond 2, and Other +1)

The following steps describe how to create a voice route. Use these steps to create the three voice routes named Redmond 1, Redmond 2, and Other +1 for this example by using the settings outlined in the earlier table.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Direct Routing**, and then select the **Voice routes** tab.
2. Click **Add**, and then enter a name and description for the voice route.
3. Set the priority and specify the dialed number pattern.
4. To enroll an SBC with the voice route, under **SBCs enrolled (optional)**, click **Add SBCs**, select the SBCs you want to enroll, and then click **Apply**.
5. To add PSTN usage records, under **PSTN usage records (optional)**, click **Add PSTN usage**, select the PSTN records you want to add, and then click **Apply**.
6. Click **Save**.

Step 3: Create a voice routing policy named "US Only" and add the "US and Canada" PSTN usage to the policy

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Voice routing policies**, and then click **Add**.
2. Type **US Only** as the name and add a description.
3. Under **PSTN usage records**, click **Add PSTN usage**, select the "US and Canada" PSTN usage record, and then click **Apply**.
4. Click **Save**.

To learn more, see Manage voice routing policies.

Step 4: Assign the voice routing policy to a user named Spencer Low

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then click the user.

2. Click **Policies**, and then next to **Assigned policies**, click **Edit**.
3. Under **Voice routing policy**, select the "US Only" policy, and then click **Save**.

To learn more, see Manage voice routing policies.

Using PowerShell

Step 1: Create the "US and Canada" PSTN usage

In a remote PowerShell session in Skype for Business Online, type:

```
Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="US and Canada"}
```

Verify that the usage was created by entering:

```
Get-CSOnlinePSTNUsage
```

Which returns a list of names that may be truncated:

```
Identity    : Global
Usage        : {testusage, US and Canada, International, karlUsage. . .}
```

The following example shows the result of running the `(Get-CSOnlinePSTNUsage).usage` Powershell command to display full names (not truncated):

```
testusage
US and Canada
International
karlUsage
New test env
Tallinn Lab Sonus
karlUsage2
Unrestricted
Two trunks
```

Step 2: Create three voice routes (Redmond 1, Redmond 2, and Other +1)

To create the "Redmond 1" route, in a PowerShell session in Skype for Business Online, enter:

```
New-CsOnlineVoiceRoute -Identity "Redmond 1" -NumberPattern "^\+1(425|206)
(\d{7})$" -OnlinePstnGatewayList sbc1.contoso.biz, sbc2.contoso.biz -Priority 1 -OnlinePstnUsages "US and
Canada"
```

Which returns:

```
Identity                : Redmond 1
Priority                : 1
Description             :
NumberPattern           : ^\+1(425|206) (\d{7})$
OnlinePstnUsages        : {US and Canada}
OnlinePstnGatewayList   : {sbc1.contoso.biz, sbc2.contoso.biz}
Name                    : Redmond 1
```

To create the Redmond 2 route, enter:

```
New-CsOnlineVoiceRoute -Identity "Redmond 2" -NumberPattern "^\+1(425|206)
(\d{7})$" -OnlinePstnGatewayList sbc3.contoso.biz, sbc4.contoso.biz -Priority 2 -OnlinePstnUsages "US and
Canada"
```

To create the Other +1 route, enter:

```
New-CsOnlineVoiceRoute -Identity "Other +1" -NumberPattern "^\+1(\d{10})$"
-OnlinePstnGatewayList sbc5.contoso.biz, sbc6.contoso.biz -OnlinePstnUsages "US and Canada"
```

Caution

Make sure that your regular expression in the NumberPattern attribute is a valid expression. You can test it using this website: https://www.regexpal.com

In some cases, there is a need to route all calls to the same SBC; use -NumberPattern ".*"

Route all calls to the same SBC.

```
Set-CsOnlineVoiceRoute -id "Redmond 1" -NumberPattern ".*" -OnlinePstnGatewayList sbc1.contoso.biz
```

Verify that you've correctly configured the route by running the `Get-CSOnlineVoiceRoute` PowerShell command using options as shown:

```
Get-CsOnlineVoiceRoute | Where-Object {($_.priority -eq 1) -or ($_.priority -eq 2) or ($_.priority -eq 4) -
Identity "Redmond 1" -NumberPattern "^\+1(425|206) (\d{7})$" -OnlinePstnGatewayList sbc1.contoso.biz,
sbc2.contoso.biz -Priority 1 -OnlinePstnUsages "US and Canada"
```

Which should return:

```
Identity            : Redmond 1
Priority               : 1
Description         :
NumberPattern         : ^\+1(425|206) (\d{7})$
OnlinePstnUsages     : {US and Canada}
OnlinePstnGatewayList    : {sbc1.contoso.biz, sbc2.contoso.biz}
Name             : Redmond 1
Identity        : Redmond 2
Priority               : 2
Description         :
NumberPattern         : ^\+1(425|206) (\d{7})$
OnlinePstnUsages     : {US and Canada}
OnlinePstnGatewayList    : {sbc3.contoso.biz, sbc4.contoso.biz}
Name             : Redmond 2

Identity        : Other +1
Priority               : 4
Description         :
NumberPattern         : ^\+1(\d{10})$
OnlinePstnUsages     : {US and Canada}
OnlinePstnGatewayList    : {sbc5.contoso.biz, sbc6.contoso.biz}
Name             : Other +1
```

In the example, the route "Other +1" was automatically assigned priority 4.

Step 3: Create a voice routing policy named "US Only" and add the "US and Canada" PSTN usage to the policy

In a PowerShell session in Skype for Business Online, type:

```
New-CsOnlineVoiceRoutingPolicy "US Only" -OnlinePstnUsages "US and Canada"
```

The result is shown in this example:

```
Identity            : Tag:US only
OnlinePstnUsages    : {US and Canada}
Description         :
RouteType           : BYOT
```

Step 4: Assign the voice routing policy to a user named Spencer Low

In a PowerShell session in Skype for Business Online, type:

```
Grant-CsOnlineVoiceRoutingPolicy -Identity "Spencer Low" -PolicyName "US Only"
```

Validate the policy assignment by entering this command:

```
Get-CsOnlineUser "Spencer Low" | select OnlineVoiceRoutingPolicy
```

The command returns the following:

```
OnlineVoiceRoutingPolicy
--------------------
US Only
```

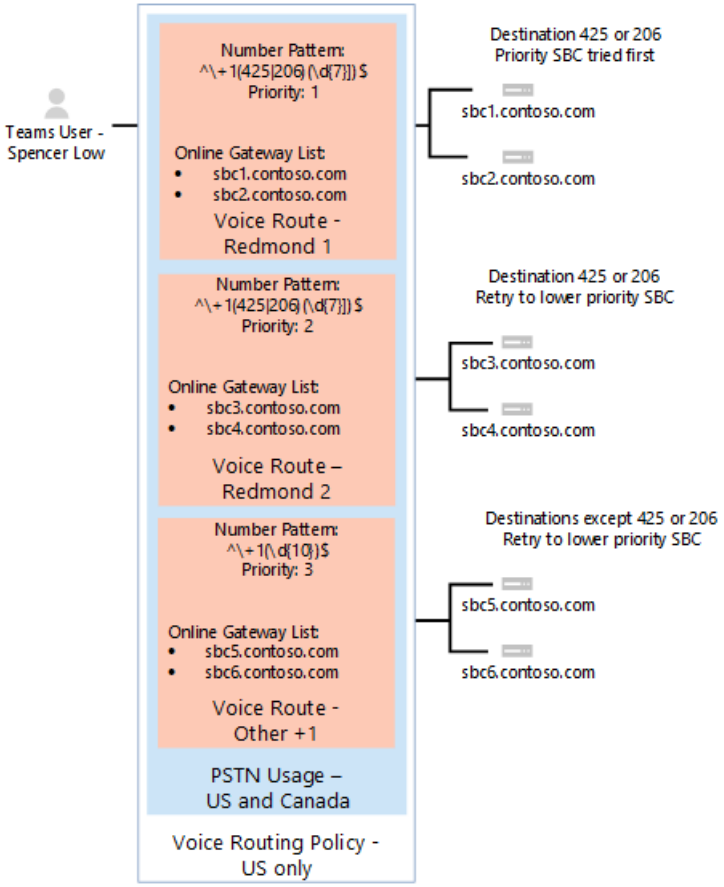
Example 2: Voice routing with multiple PSTN usages

The voice routing policy created in Example 1 only allows calls to phone numbers in the US and Canada--unless the Microsoft Calling Plan license is also assigned to the user.

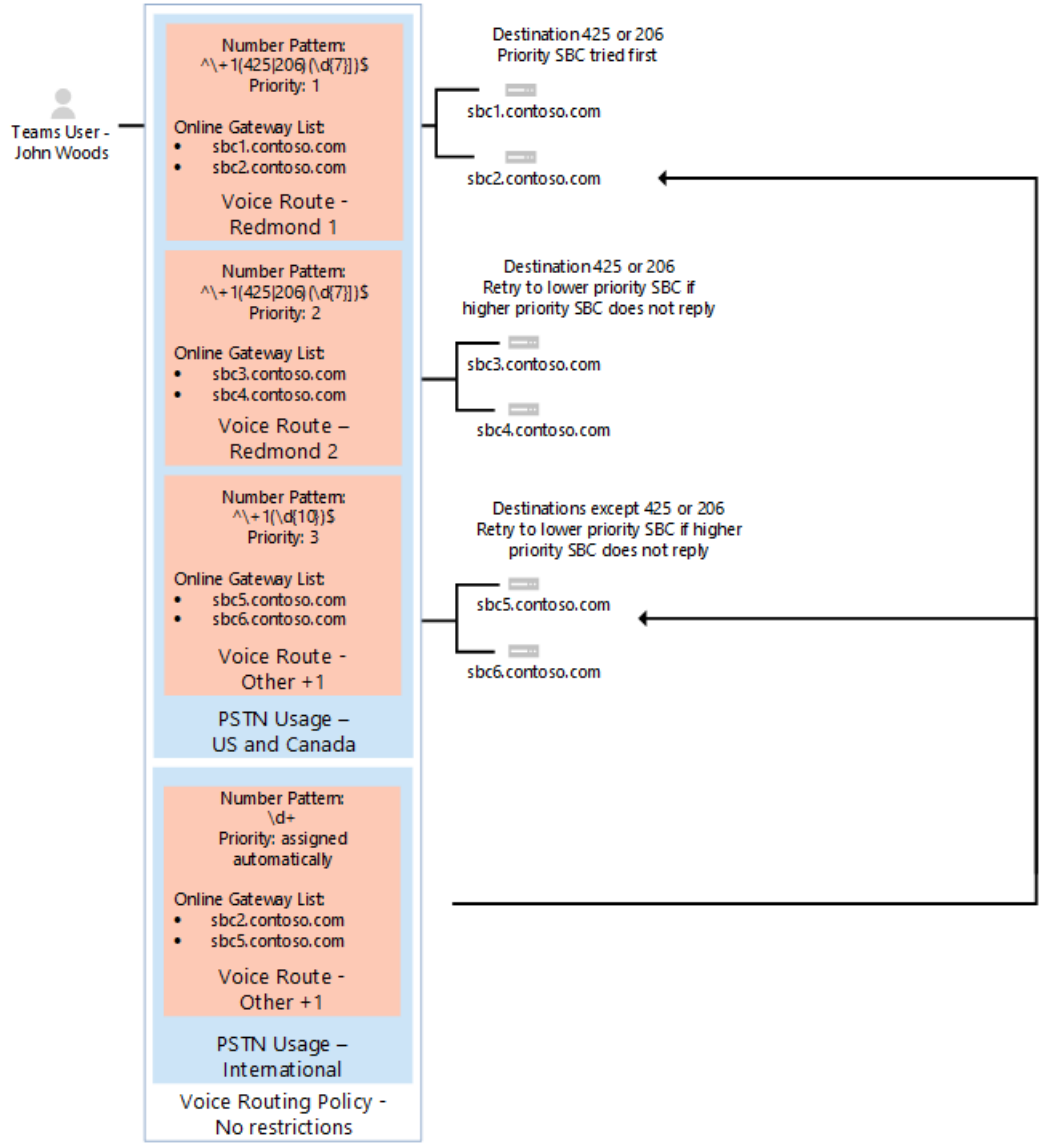
In the example that follows, you can create the "No Restrictions" voice routing policy. The policy reuses the "US and Canada" PSTN usage created in Example 1, as well as the new "International" PSTN usage. This policy routes all other calls to the SBCs sbc2.contoso.biz and sbc5.contoso.biz.

The examples that are shown assign the US Only policy to user Spencer Low, and the No Restrictions policy to the user John Woods so that routing occurs as follows:

- Spencer Low – US Only policy. Calls are allowed only to US and Canadian numbers. When calling to the Redmond number range, the specific set of SBCs must be used. Non-US numbers will not be routed unless the Calling Plan license is assigned to the user.
- John Woods – International policy. Calls are allowed to any number. When calling to the Redmond number range, the specific set of SBCs must be used. Non-US numbers will be routed using sbc2.contoso.biz and sbc5.contoso.biz.



For all other calls, if a user has both licenses (Microsoft Phone System and Microsoft Calling Plan), automatic route is used. If nothing matches the number patterns in the administrator-created online voice routes, then the call is routed using Microsoft Calling Plan. If the user has only Microsoft Phone System, the call is dropped because no matching rules are available.



The following table summarizes routing policy "No Restrictions" usage designations and voice routes.

PSTN USAGE	VOICE ROUTE	NUMBER PATTERN	PRIORITY	SBC	DESCRIPTION
US and Canada	"Redmond 1"	^\+1(425|206)(\d{7})$	1	sbc1.contoso.biz sbc2.contoso.biz	Active route for callee numbers +1 425 XXX XX XX or +1 206 XXX XX XX
US and Canada	"Redmond 2"	^\+1(425|206)(\d{7})$	2	sbc3.contoso.biz sbc4.contoso.biz	Backup route for callee numbers +1 425 XXX XX XX or +1 206 XXX XX XX
US and Canada	"Other +1"	^\+1(\d{10})$	3	sbc5.contoso.biz sbc6.contoso.biz	Route for callee numbers +1 XXX XXX XX XX (except +1 425 XXX XX XX or +1 206 XXX XX XX)

PSTN USAGE	VOICE ROUTE	NUMBER PATTERN	PRIORITY	SBC	DESCRIPTION
International	International	\d+	4	sbc2.contoso.biz sbc5.contoso.biz	Route for any number pattern

NOTE

- The order of PSTN usages in voice routing policies is critical. The usages are applied in order, and if a match is found in the first usage, then other usages are never evaluated. The "International" PSTN usage must be placed after the "US and Canada" PSTN usage. To change the order of the PSTN usages, run the `Set-CSOnlineVoiceRoutingPolicy` command. For example, to change the order from "US and Canada" first and "International" second to the reverse order run:
  ```
  Set-CsOnlineVoiceRoutingPolicy -id tag:"no Restrictions" -OnlinePstnUsages @{Replace="International", "US and Canada"}
  ```
- The priority for "Other +1" and "International" voice routes are assigned automatically. They don't matter as long as they have lower priorities than "Redmond 1" and "Redmond 2."

Example 2: Configuration steps

The following example shows how to:

1. Create a new PSTN usage called International.
2. Create a new voice route called International.
3. Create a voice routing policy called No Restrictions.
4. Assign the policy to user John Woods.

You can use the Microsoft Teams admin center or PowerShell to perform these steps.

Using the Microsoft Teams admin center

Step 1: Create the "International" PSTN usage

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Direct Routing**, and then in the upper-right corner, select **Manage PSTN usage records**.
2. Click **Add**, type **International**, and then click **Apply**.

Step 2: Create the "International" voice route

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Direct Routing**, and then select the **Voice routes** tab.
2. Click **Add**, enter "International" as the name, and then add the description.
3. Set the priority to 4, and then set the dialed number pattern to \d+.
4. Under **SBCs enrolled (optional)**, click **Add SBCs**, select sbc2.contoso.biz and sbc5.contoso.biz, and then click **Apply**.
5. Under **PSTN usage records (optional)**, click **Add PSTN usage**, select the "International" PSTN usage record, and then click **Apply**.
6. Click **Save**.

Step 3: Create a voice routing policy named "No Restrictions" and add the "US and Canada" and "International" PSTN usages to the policy

The PSTN usage "US and Canada" are reused in this voice routing policy to preserve special handling for calls to number "+1 425 XXX XX XX" and "+1 206 XXX XX XX" as local or on-premises calls.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Voice routing policies**, and then click **Add**.
2. Type **No Restrictions** as the name and add a description.

3. Under **PSTN usage records**, click **Add PSTN usage**, select the "US and Canada" PSTN usage record, and then select the "International" PSTN usage record. Click **Apply**.

   Take note of the order of PSTN usages:

   - If a call made to number "+1 425 XXX XX XX" with the usages configured as in this example, the call follows the route set in "US and Canada" usage and the special routing logic is applied. That is, the call is routed using sbc1.contoso.biz and sbc2.contoso.biz first, and then sbc3.contoso.biz and sbc4.contoso.biz as the backup routes.
   - If "International" PSTN usage is before "US and Canada," calls to +1 425 XXX XX XX are routed to sbc2.contoso.biz and sbc5.contoso.biz as part of the routing logic.

4. Click **Save**.

To learn more, see Manage voice routing policies.

Step 4: Assign the voice routing policy to a user named John Woods

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then click the user.
2. Click **Policies**, and then next to **Assigned policies**, click **Edit**.
3. Under **Voice routing policy**, select the "No Restrictions" policy, and then click **Save**.

The result is that the voice policy applied to John Woods' calls is unrestricted and will follow the logic of call routing available for US, Canada, and International calling.

Using PowerShell

Step 1: Create the "International" PSTN usage

In a remote PowerShell session in Skype for Business Online, enter:

```
Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="International"}
```

Step 2: Create a new voice route named "International"

```
New-CsOnlineVoiceRoute -Identity "International" -NumberPattern ".*" -OnlinePstnGatewayList sbc2.contoso.biz,
sbc5.contoso.biz -OnlinePstnUsages "International"
```

Which returns:

```
Identity                : International
Priority                : 5
Description             :
NumberPattern           : .*
OnlinePstnUsages        : {International}
OnlinePstnGatewayList   : {sbc2.contoso.biz, sbc5.contoso.biz}
Name                    : International
```

Step 3: Create a voice routing policy named "No Restrictions"

The PSTN usage "Redmond 1" and "Redmond" are reused in this voice routing policy to preserve special handling for calls to number "+1 425 XXX XX XX" and "+1 206 XXX XX XX" as local or on-premises calls.

```
New-CsOnlineVoiceRoutingPolicy "No Restrictions" -OnlinePstnUsages "US and Canada", "International"
```

Take note of the order of PSTN usages:

- If a call made to number "+1 425 XXX XX XX" with the usages configured as in the following example, the call follows the route set in "US and Canada" usage and the special routing logic is applied. That is, the call

is routed using sbc1.contoso.biz and sbc2.contoso.biz first, and then sbc3.contoso.biz and sbc4.contoso.biz as the backup routes.

- If "International" PSTN usage is before "US and Canada," calls to +1 425 XXX XX XX are routed to sbc2.contoso.biz and sbc5.contoso.biz as part of the routing logic. Enter the command:

```
New-CsOnlineVoiceRoutingPolicy "No Restrictions" -OnlinePstnUsages "US and Canada", "International"
```

Which returns:

```
<pre>
Identity              : International
OnlinePstnUsages : {US and Canada, International}
Description         :
RouteType               : BYOT
</pre>
```

Step 4: Assign the voice routing policy to the user named John Woods

```
Grant-CsOnlineVoiceRoutingPolicy -Identity "John Woods" -PolicyName "No Restrictions"
```

Then verify the assignment using the command:

```
Get-CsOnlineUser "John Woods" | Select OnlineVoiceRoutingPolicy
```

Which returns:

```
OnlineVoiceRoutingPolicy
------------------------
No Restrictions
```

The result is that the voice policy applied to John Woods' calls is unrestricted, and will follow the logic of call routing available for US, Canada, and International calling.

See also

Plan Direct Routing

Configure Direct Routing

Translate phone numbers to an alternate format

10/6/2020 • 3 minutes to read • Edit Online

This article describes how to translate numbers for outbound and inbound calls to an alternate format. This is step 4 of the following steps for configuring Direct Routing:

- Step 1. Connect the SBC with Microsoft Phone System and validate the connection
- Step 2. Enable users for Direct Routing, voice, and voicemail
- Step 3. Configure voice routing
- **Step 4. Translate numbers to an alternate format** (This article)

For information on all the steps required for setting up Direct Routing, see Configure Direct Routing.

Sometimes tenant administrators may want to change the number for outbound and/or inbound calls based on the patterns they created to ensure interoperability with Session Border Controllers (SBCs). This article describes how you can specify a Number Translation Rules policy to translate numbers to an alternate format.

You can use the Number Translation Rules policy to translate numbers for the following:

- Inbound calls: Calls from a PSTN endpoint (caller) to a Teams client (callee)
- Outbound calls: Calls from a Teams client (caller) to a PSTN endpoint (callee)

The policy is applied at the SBC level. You can assign multiple translation rules to an SBC, which are applied in the order that they appear when you list them in PowerShell. You can also change the order of the rules in the policy.

To create, modify, view, and delete number manipulation rules, use the New-CsTeamsTranslationRule, Set-CsTeamsTranslationRule, Get-CsTeamsTranslationRule, and Remove-CsTeamsTranslationRule cmdlets.

To assign, configure, and list number manipulation rules on SBCs, use the New-CSOnlinePSTNGateway and Set-CSOnlinePSTNGateway cmdlets together with the InboundTeamsNumberTranslationRules, InboundPSTNNumberTranslationRules, OutboundTeamsNumberTranslationRules, OutboundPSTNNumberTranslationRules, InboundTeamsNumberTranslationRules, InboundPSTNNumberTranslationRules, OutboundTeamsNumberTranslationRules, and OutboundPSTNNumberTranslationRules parameters.

> **NOTE**
> The maximum total number of translation rules is 400, maximum translation parameter name length is 100 symbols, maximum translation parameter pattern length is 1024 symbols, and maximum translation parameter translation length is 256 symbols.

Example SBC configuration

For this scenario, the `New-CsOnlinePSTNGateway` cmdlet is run to create the following SBC configuration:

```
New-CSOnlinePSTNGateway -Identity sbc1.contoso.com -SipSignalingPort 5061 –InboundTeamsNumberTranslationRules
‘AddPlus1’, ‘AddE164SeattleAreaCode’ -InboundPSTNNumberTranslationRules ‘AddPlus1’ -
OutboundPSTNNumberTranslationRules ‘AddSeattleAreaCode’,  -OutboundTeamsNumberTranslationRules ‘StripPlus1’
```

The translation rules assigned to the SBC are summarized in the following table:

NAME	PATTERN	TRANSLATION
AddPlus1	^(\d{10})$	+1$1
AddE164SeattleAreaCode	^(\d{4})$	+1206555$1
AddSeattleAreaCode	^(\d{4})$	425555$1
StripPlus1	^+1(\d{10})$	$1

In the following examples, there are two users, Alice and Bob. Alice is a Teams user whose number is +1 206 555 0100. Bob is a PSTN user whose number is +1 425 555 0100.

Example 1: Inbound call to a ten-digit number

Bob calls Alice using a non-E.164 ten-digit number. Bob dials 2065550100 to reach Alice. SBC uses 2065550100 in the RequestURI and To headers and 4255550100 in the From header.

HEADER	ORIGINAL	TRANSLATED HEADER	PARAMETER AND RULE APPLIED
RequestURI	INVITE sip:2065550100@sbc.contoso.com	INVITE sip:+12065550100@sbc.contoso.com	InboundTeamsNumberTranslationRules 'AddPlus1'
TO	TO: <sip:2065550100@sbc.contoso.com>	TO: <sip:+12065550100@sbc.contoso.com>	InboundTeamsNumberTranlationRules 'AddPlus1'
FROM	FROM: <sip:4255550100@sbc.contoso.com>	FROM: <sip:+14255550100@sbc.contoso.com>	InboundPSTNNumberTranslationRules 'AddPlus1'

Example 2: Inbound call to a four-digit number

Bob calls Alice using a four-digit number. Bob dials 0100 to reach Alice. SBC uses 0100 in the RequestURI and To headers and 4255550100 in the From header.

HEADER	ORIGINAL	TRANSLATED HEADER	PARAMETER AND RULE APPLIED
RequestURI	INVITE sip:0100@sbc.contoso.com	INVITE sip:+12065550100@sbc.contoso.com	InboundTeamsNumberTranlationRules 'AddE164SeattleAreaCode'
TO	TO: <sip:0100@sbc.contoso.com>	TO: <sip:+12065550100@sbc.contoso.com>	InboundTeamsNumberTranlationRules 'AddE164SeattleAreaCode'
FROM	FROM: <sip:4255550100@sbc.contoso.com>	FROM: <sip:+14255550100@sbc.contoso.com>	InboundPSTNNumberTranlationRules 'AddPlus1'

Example 3: Outbound call using a ten-digit non-E.164 number

Alice calls Bob using a ten-digit number. Alice dials 425 555 0100 to reach Bob. SBC is configured to use non-E.164 ten-digit numbers for both Teams and PSTN users.

In this scenario, a dial plan translates the number before sending it to the Direct Routing interface. When Alice enters 425 555 0100 in the Teams client, the number is translated to +14255550100 by the country dial plan. The resulting numbers are a cumulative normalization of the dial plan rules and Teams translation rules. The Teams translation rules remove the "+1" that was added by the dial plan.

HEADER	ORIGINAL	TRANSLATED HEADER	PARAMETER AND RULE APPLIED
RequestURI	INVITE sip:+14255550100@sbc.contoso.com	INVITE sip:4255550100@sbc.contoso.com	OutboundPSTNNumberTranlationRules 'StripPlus1'
TO	TO: <sip:+14255550100@sbc.contoso.com>	TO: <sip:4255555555@sbc.contoso.com>	OutboundPSTNNumberTranlationRules 'StripPlus1'
FROM	FROM: <sip:+12065550100@sbc.contoso.com>	FROM: <sip:2065550100@sbc.contoso.com>	OutboundTeamsNumberTranlationRules 'StripPlus1'

Example 4: Outbound call using a four-digit non-E.164 number

Alice calls Bob using a four-digit number. Alice uses 0100 to reach Bob from Calls or by using a contact. SBC is configured to use non-E.164 four-digit numbers for Teams users and ten-digit numbers for PSTN users. The dial plan isn't applied in this scenario.

HEADER	ORIGINAL	TRANSLATED HEADER	PARAMETER AND RULE APPLIED
RequestURI	INVITE sip:0100@sbc.contoso.com	INVITE sip:4255550100@sbc.contoso.com	InboundTeamsNumberTranlationRules 'AddSeattleAreaCode'
TO	TO: <sip:0100@sbc.contoso.com>	TO: <sip:4255555555@sbc.contoso.com>	InboundTeamsNumberTranlationRulesList 'AddSeattleAreaCode'
FROM	FROM: <sip:+12065550100@sbc.contoso.com>	FROM: <sip:2065550100@sbc.contoso.com>	InboundPSTNNumberTranlationRules 'StripPlus1'

See also

Plan Direct Routing

Configure Direct Routing

Configure a Session Border Controller for multiple tenants

11/2/2020 • 11 minutes to read • Edit Online

Direct Routing supports configuring one Session Border Controller (SBC) to serve multiple tenants.

> **NOTE**
> This scenario is designed for Microsoft partners and/or PSTN carriers, referred to as carriers later in this document. A carrier sells telephony services delivered to Microsoft Teams to their customers.

A carrier:

- Deploys and manages an SBC in their datacenter (customers do not need to implement an SBC, and they receive telephony services from the carrier in the Teams client).
- Interconnects the SBC to multiple tenants.
- Provides PSTN services to customers.
- Manages call quality end to end.
- Charges separately for PSTN services.

Microsoft does not manage carriers. Microsoft offers a PBX (Microsoft Phone System) and a Teams client. Microsoft also certifies phones, and certifies SBCs that can be used with the Microsoft Phone System. Before choosing a carrier, please ensure that your choice has a certified SBC and can manage voice quality end to end.

The following are the technical implementation steps to configure the scenario.

Carrier only:

1. Deploy the SBC and configure it for the hosting scenario according to the instructions from the certified SBC vendors.
2. Register a base domain name in the carrier tenant and request a wildcard certificate.
3. Register a subdomain for every customer, which is part of the base domain.

Carrier with a Customer Global Administrator:

1. Add the subdomain name to the customer tenant.
2. Activate the subdomain name.
3. Configure the trunk from the carrier to the customer tenant and provision users.

Please make sure you understand DNS basics and how the domain name is managed in Microsoft 365 or Office 365. Review Get help with Microsoft 365 or Office 365 domains before proceeding further.

Deploy and configure the SBC

For the detailed steps on how to deploy and configure SBCs for an SBC hosting scenario, please refer to the SBC vendor's documentation.

- **AudioCodes:** Direct Routing Configuration notes, the configuration of the SBC hosting scenario described in "Connecting AudioCodes SBC to Microsoft Teams Direct Routing Hosting Model Configuration Note."
- **Oracle:** Direct Routing Configuration notes, the configuration of the SBC hosting scenario is described in the

"Microsoft" section.

- **Ribbon Communications:** Please refer to the Ribbon Communications SBC Core Microsoft Teams Configuration Guide for documentation on how to configure Ribbon Core Series SBCs and to this page Ribbon Best Practice - Configuring Carriers for Microsoft Teams Direct Routing SBC Edge
- **TE-Systems (anynode):** Please register on the TE-Systems Community page for documentation and examples on how to configure anynode SBC for multiple tenants.
- **Metaswitch:** Please register on the Metaswitch Community page for documentation on how to enable Perimeta SBC for multiple tenants.

> **NOTE**
> Please pay attention to how to configure the "Contact" header. The Contact header is used to find the customer tenant on the incoming invite message.

Register a base domain and subdomains

For the hosting scenario, you need to create:

- One base domain name owned by the carrier.
- A subdomain that is part of the base domain name in every customer tenant.

In the following example:

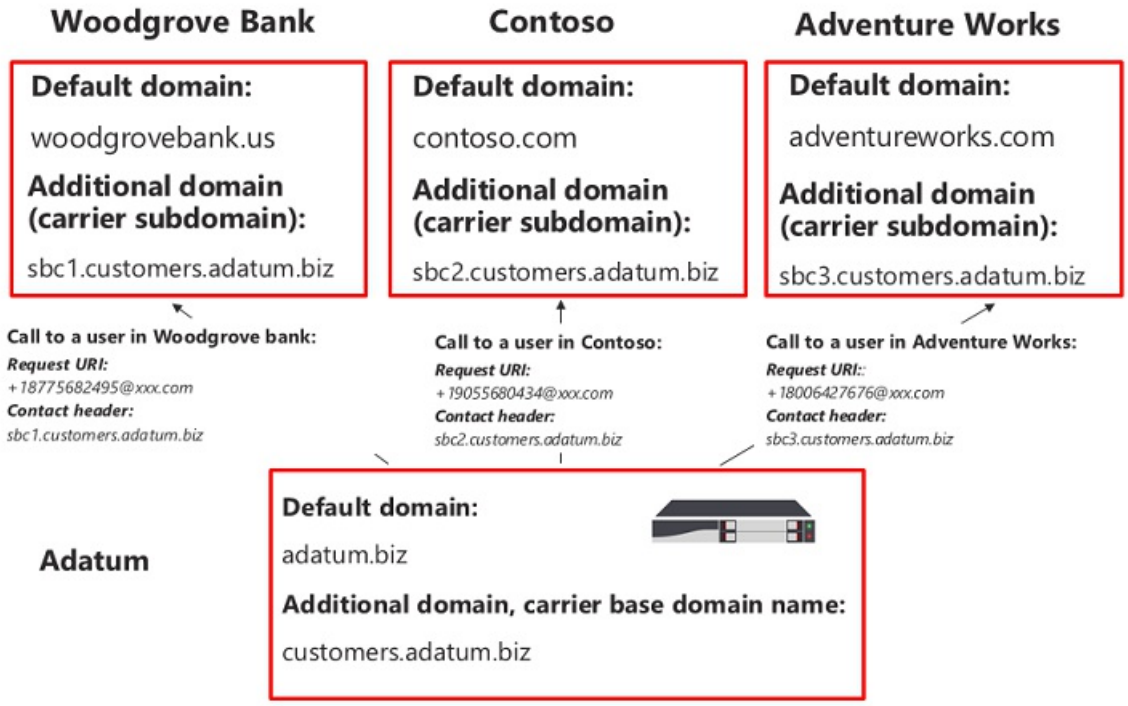
- Adatum is a carrier that serves several customers by providing Internet and telephony services.
- Woodgrove Bank, Contoso, and Adventure Works are three customers that have Microsoft 365 or Office 365 domains but receive the telephony services from Adatum.

Subdomains **MUST** match the FQDN name of the trunk that will be configured for the customer and the FQDN in the Contact header when sending the Invite to Microsoft 365 or Office 365.

When a call arrives at the Microsoft 365 or Office 365 Direct Routing interface, the interface uses the Contact header to find the tenant where the user should be looked up. Direct Routing does not use phone number lookup on the Invite, as some customers might have non-DID numbers that can overlap in several tenants. Therefore, the FQDN name in the Contact header is required to identify the exact tenant to look up the user by the phone number.

Please review Get help with Office 365 domains for more information about creating domain names in Microsoft 365 or Office 365 organizations.

The following diagram summarizes the requirements to base domain, subdomains, and Contact header.



The SBC requires a certificate to authenticate the connections. For the SBC hosting scenario, the carrier needs to request a certificate with SAN **.base_domain (for example, *.customers.adatum.biz)*. This certificate can be used to authenticate connections to multiple tenants served from a single SBC.

The following table is an example of one configuration.

NEW DOMAIN NAME	TYPE	REGISTERED	CERTIFICATE SAN FOR SBC	TENANT DEFAULT DOMAIN IN THE EXAMPLE	FQDN NAME THAT SBC MUST PRESENT IN THE CONTACT HEADER WHEN SENDING CALLS TO USERS
customers.adatum.biz	Base	In carrier tenant	*.customers.adatum.biz	adatum.biz	NA, this is a service tenant, no users
sbc1.customers.adatum.biz	Subdomain	In a customer tenant	*.customers.adatum.biz	woodgrovebank.us	sbc1.customers.adatum.biz
sbc2.customers.adatum.biz	Subdomain	In a customer tenant	*.customers.adatum.biz	contoso.com	sbc2.customers.adatum.biz
sbc3.customers.adatum.biz	Subdomain	In a customer tenant	*.customers.adatum.biz	adventureworks.com	sbc3.customers.adatum.biz

To configure the base and subdomains, please follow the steps described below. In the example, we will configure a base domain name (customers.adatum.biz) and a subdomain for one customer (sbc1.customers.adatum.biz in Woodgrove Bank tenant).

> **NOTE**
>
> Use sbcX.customers.adatum.biz to enable voice in the carrier tenant. sbcX can be any unique and valid alphanumeric hostname.

Register a base domain name in the carrier tenant

These actions are performed in the carrier tenant.

Ensure that you have appropriate rights in the carrier tenant

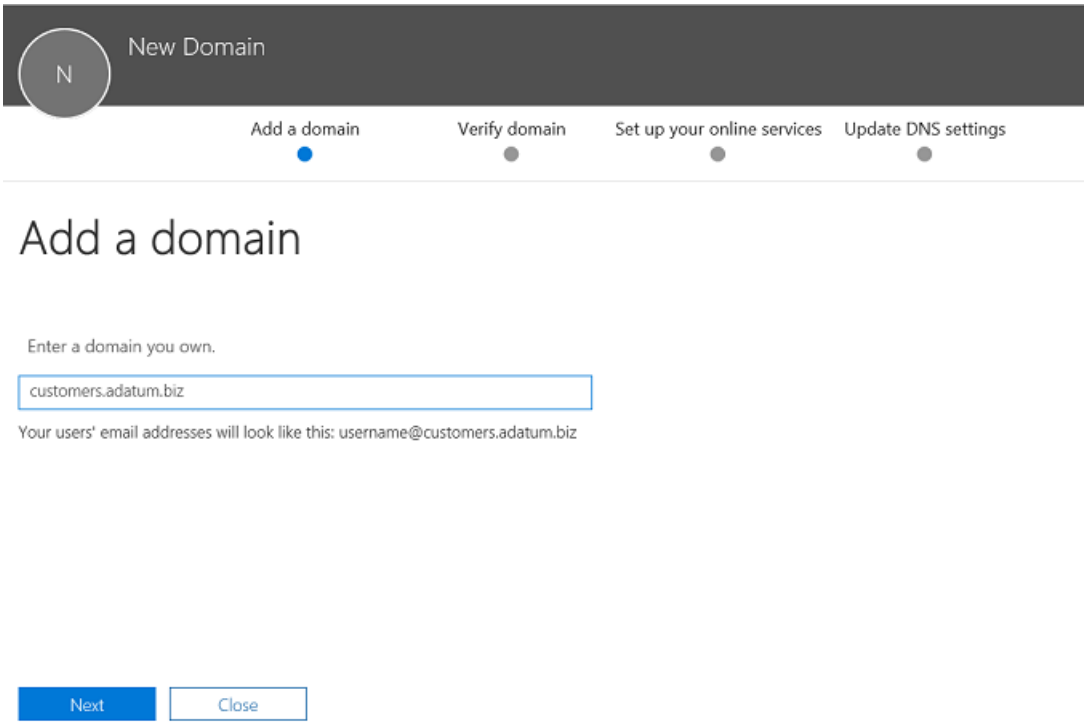
You can only add new domains if you signed in to the Microsoft 365 admin center as a Global Administrator.

To validate the role you have, please sign in to the Microsoft 365 admin center (https://portal.office.com), go to **Users** > **Active Users**, and then verify that you have a Global Administrator role.

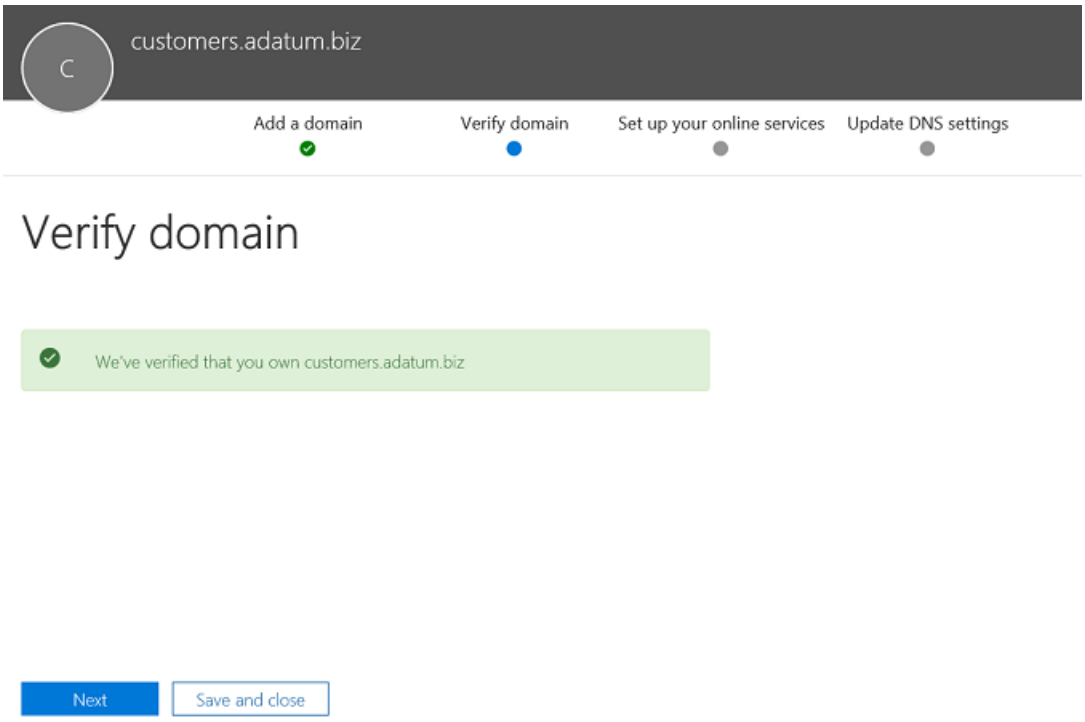
For more information about admin roles and how to assign a role in Microsoft 365 or Office 365, see About admin roles.

Add a base domain to the tenant and verify it

1. In the Microsoft 365 admin center, go to **Setup** > **Domains** > **Add domain**.
2. In the **Enter a domain you own** box, type the FQDN of the base domain. In the following example, the base domain is *customers.adatum.biz*.

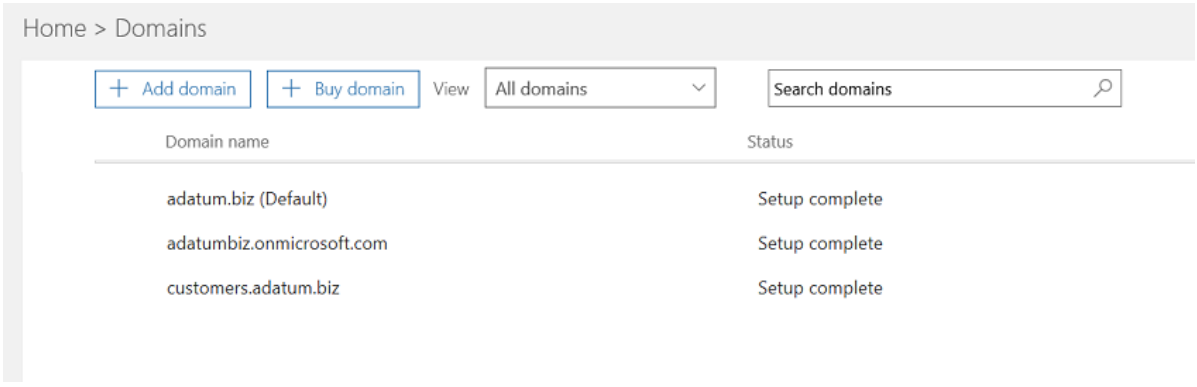


3. Click **Next**.
4. In the example, the tenant already has adatum.biz as a verified domain name. The wizard will not ask for additional verification because customers.adatum.biz is a subdomain for the already registered name. However, if you add an FQDN that has not been verified before, you will need to go through the process of verification. The process of verification is described below.



5. Click **Next**, and on the **Update DNS Settings** page, select **I'll add the DNS records myself** and click **Next**.

6. On the next page, clear all values (unless you want to use the domain name for Exchange, SharePoint, or Teams/Skype for Business), click **Next**, and then click **Finish**. Make sure your new domain is in the Setup complete status.

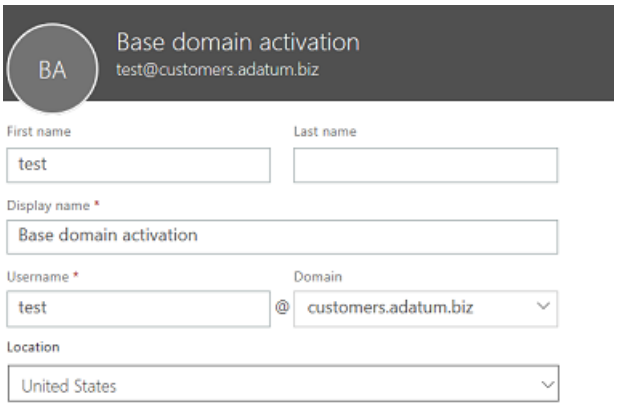


Activate the domain name

After you have registered a domain name, you need to activate it by adding at least one E1, E3, or E5 licensed user and assigning a SIP address with the FQDN portion of the SIP address matching the created base domain. License can be revoked after the domain activation (it can take up to 24 hours).

Please review Get help with Microsoft 365 or Office 365 domains for more information about adding users in Microsoft 365 or Office 365 organizations.

For example: test@customers.adatum.biz



Register a subdomain name in a customer tenant

You will need to create a unique subdomain name for every customer. In this example, we will create a subdomain sbc1.customers.adatum.biz in a tenant with the default domain name woodgrovebank.us.

All actions below are in the customer tenant.

Ensure that you have appropriate rights in the customer tenant

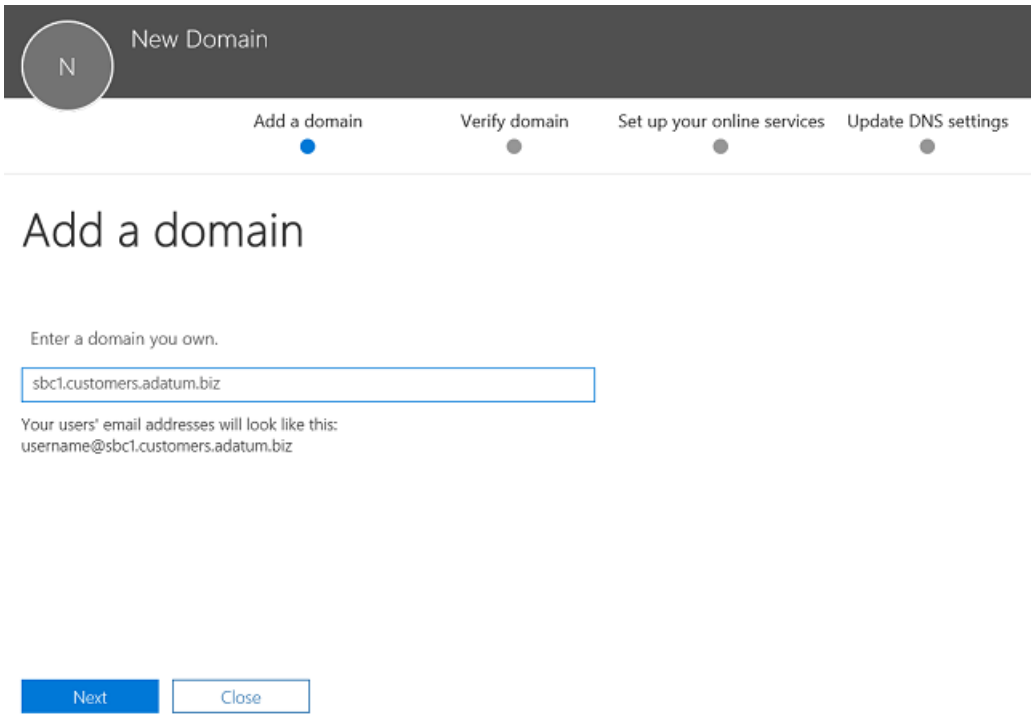
You can only add new domains if you signed in to the Microsoft 365 admin center as a Global Administrator.

To validate the role you have, please sign in to the Microsoft 365 admin center (https://portal.office.com), go to **Users** > **Active Users**, and then verify that you have a Global Administrator role.

For more information about admin roles and how to assign a role in Microsoft 365 or Office 365, see About admin roles.

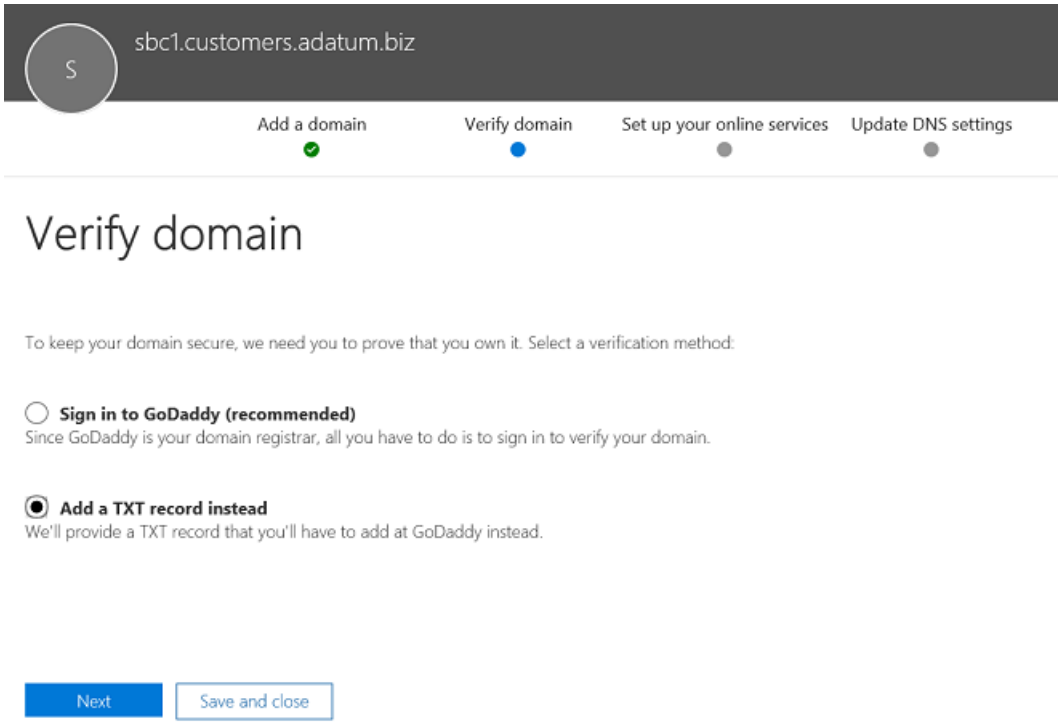
Add a subdomain to the customer tenant and verify it

1. In the Microsoft 365 admin center, go to **Setup** > **Domains** > **Add domain**.
2. In the **Enter a domain you own** box, type the FQDN of the subdomain for this tenant. In the example below, the subdomain is sbc1.customers.adatum.biz.

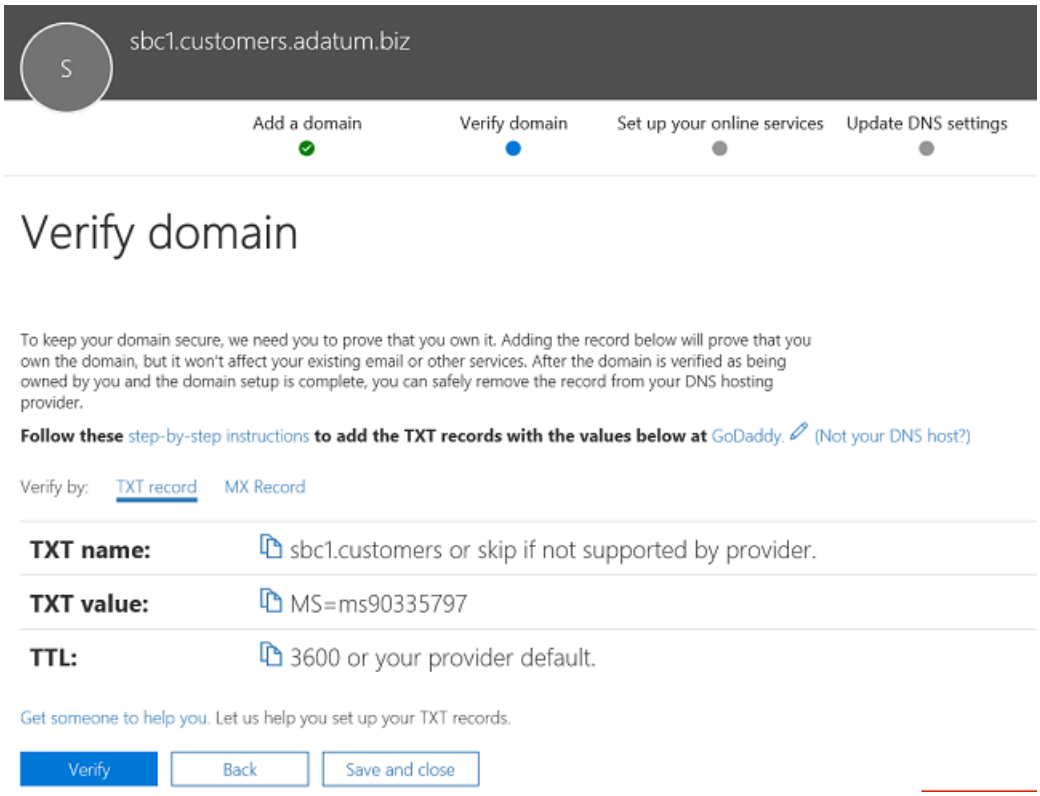


3. Click **Next**.
4. The FQDN has never been registered in the tenant. In the next step, you will need to verify the domain.

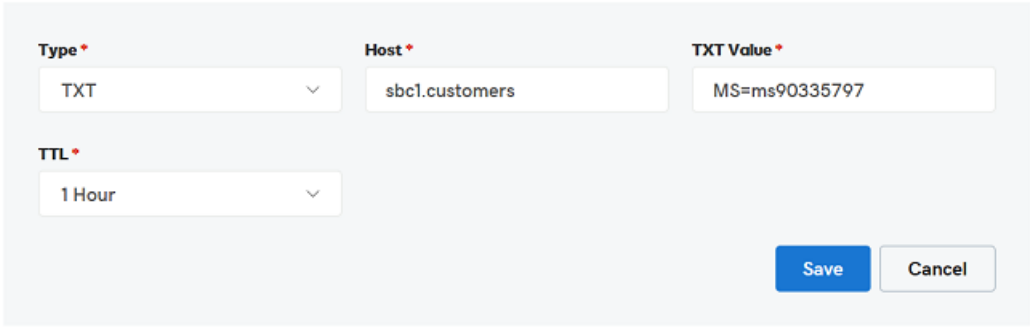
Select **Add a TXT record instead**.



5. Click **Next**, and note the TXT value generated to verify the domain name.

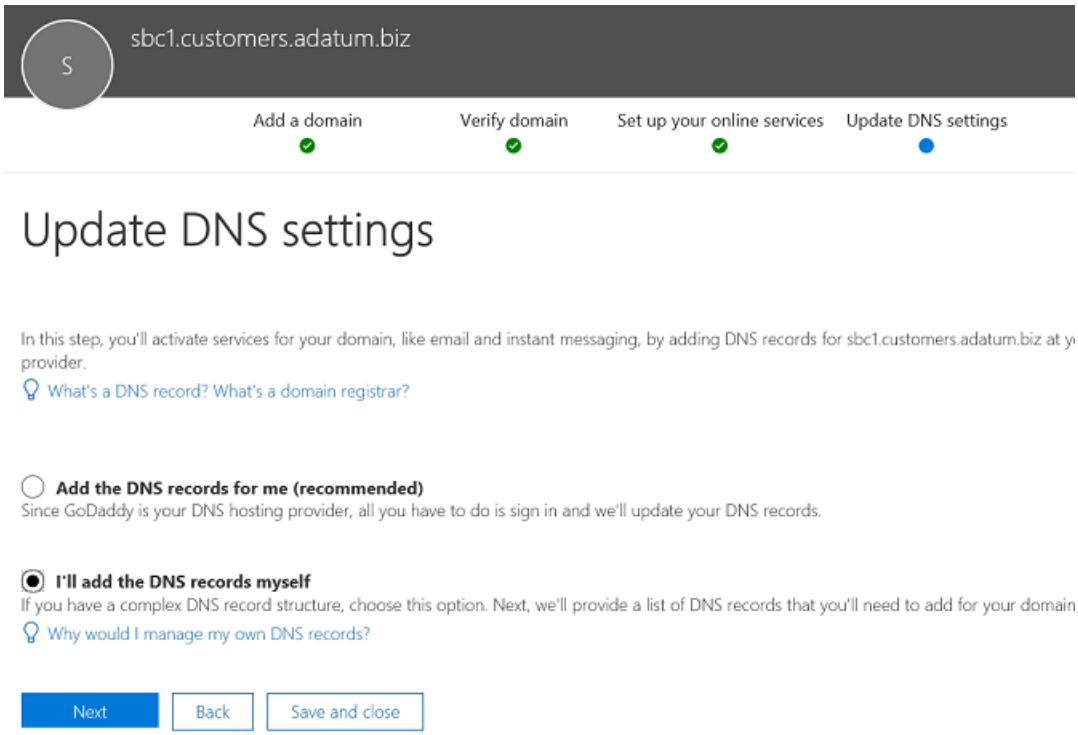


6. Create the TXT record with the value from the previous step in carrier's DNS hosting provider.

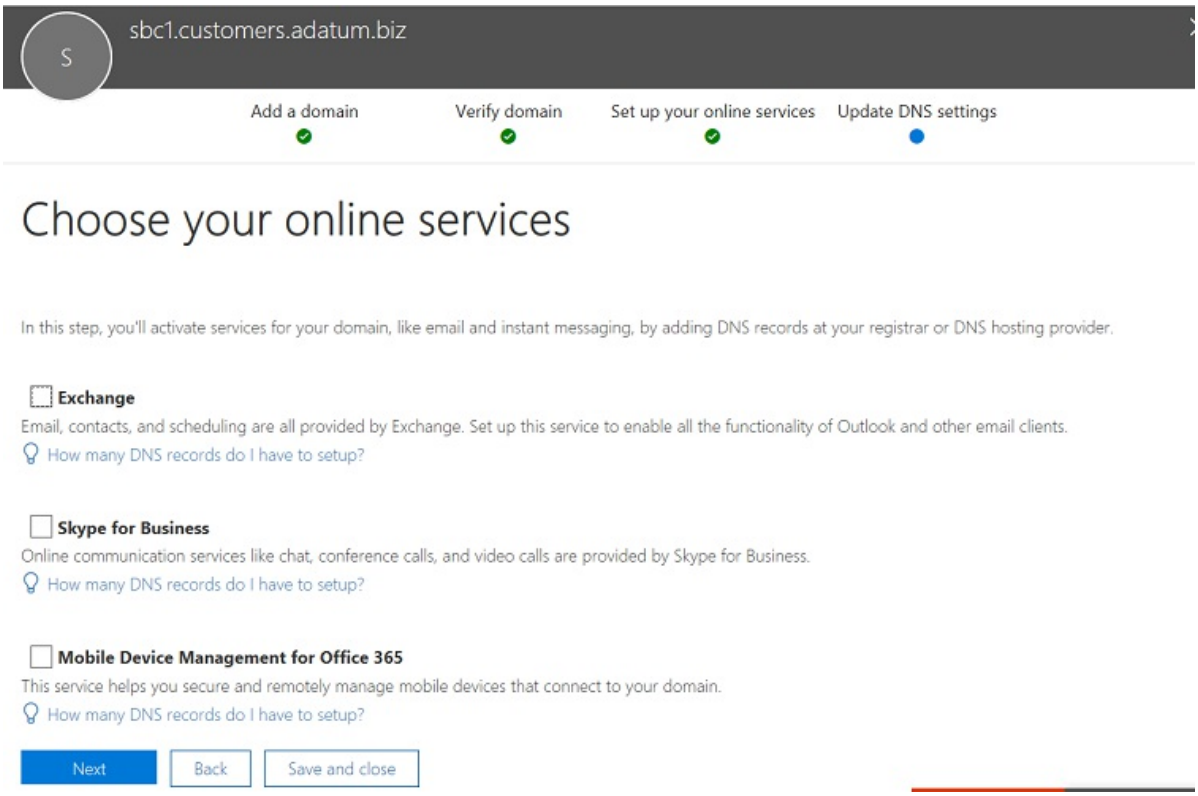


For more information, refer to Create DNS records at any DNS hosting provider.

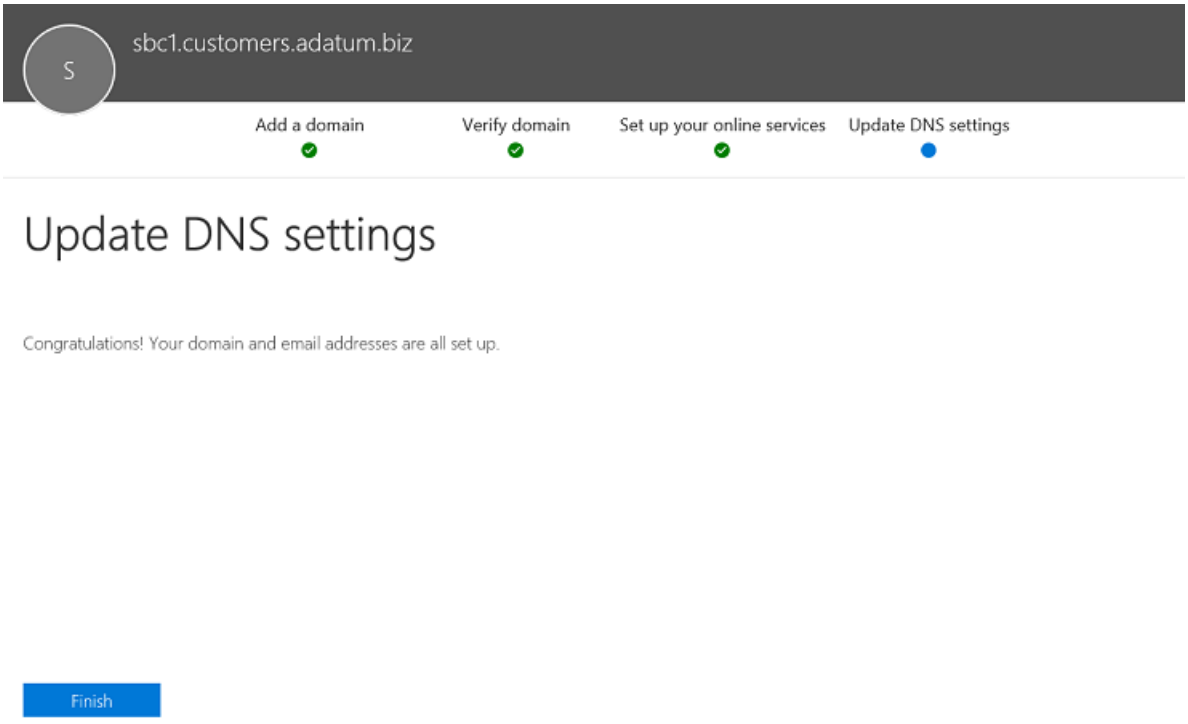
7. Go back to the customer's Microsoft 365 admin center and click **Verify**.
8. On the next page, select **I'll add the DNS records myself** and click **Next**.



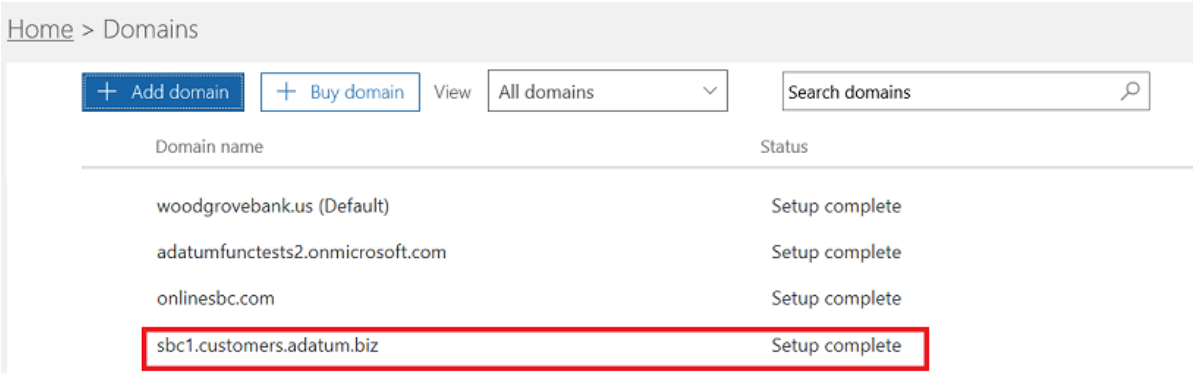
9. On the **Choose your online services** page, clear all options and click **Next**.



10. Click **Finish** on the **Update DNS settings** page.



11. Ensure that the status is **Setup complete**.

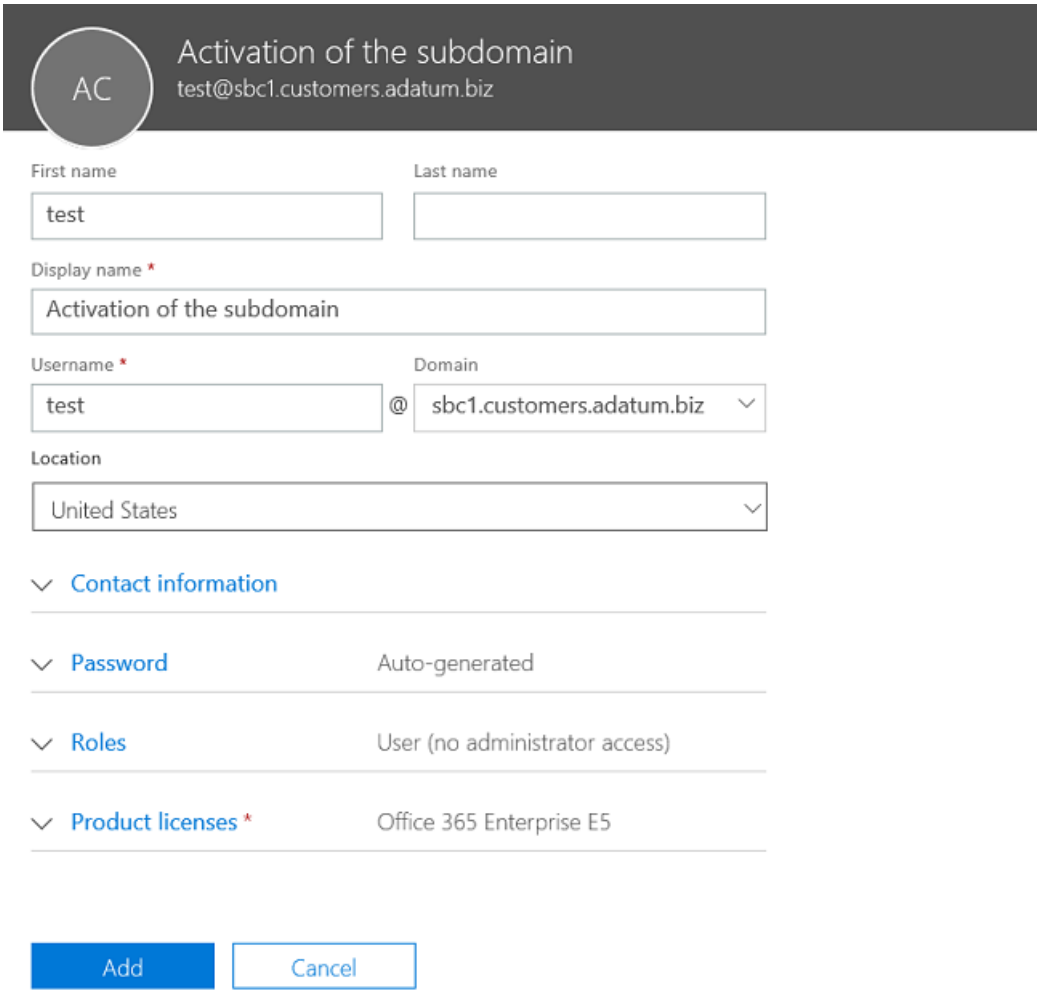


Activate the subdomain name

After you register a domain name, you need to activate it by adding at least one user and assign a SIP address with the FQDN portion of the SIP address matching the created subdomain in the customer tenant. License can be revoked from user after the subdomain activation (it can take up to 24 hours).

Please review Get help with Microsoft 365 or Office 365 domains for more information about adding users in Microsoft 365 or Office 365 organizations.

For example: test@sbc1.customers.adatum.biz



Create a trunk and provision users

With the initial release of Direct Routing, Microsoft required a trunk to be added to each served tenant (customer tenant) using New-CSOnlinePSTNGateway.

However, this has not proved optimal for two reasons:

- **Overhead management**. Offloading or draining an SBC, for example, changes some parameters, like

enabling or disabling media bypass. Changing the port requires changing parameters in multiple tenants (by running Set-CSOnlinePSTNGateway), but it is in fact the same SBC.

- **Overhead processing**. Gathering and monitoring trunk health data - SIP options collected from multiple logical trunks that are, in reality, the same SBC and the same physical trunk, slows down processing of the routing data.

Based on this feedback, Microsoft is bringing in a new logic to provision the trunks for the customer tenants.

Two new entities were introduced:

- A carrier trunk registered in the carrier tenant using the command New-CSOnlinePSTNGateway, for example New-CSOnlinePSTNGateway -FQDN customers.adatum.biz -SIPSignalingport 5068 -ForwardPAI $true.
- A derived trunk, that does not require registration. It is simply a desired host name added in from of the carrier trunk. It derives all of its configuration parameters from the carrier trunk. The derived trunk doesn't need to be created in PowerShell, and the association with the carrier trunk is based on the FQDN name (see details below).

Provisioning logic and example

- Carriers only need to set up and manage a single trunk (carrier trunk in the carrier domain), using the Set-CSOnlinePSTNGateway command. In the example above it is adatum.biz;
- In the customer tenant, the carrier need only to add the derived trunk FQDN to the voice routing policies of the users. There is no need to run New-CSOnlinePSTNGateway for a trunk.
- The derived trunk, as the name suggests, inherits or derives all the configuration parameters from the carrier trunk. Examples:
- Customers.adatum.biz – the carrier trunk which needs to be created in the carrier tenant.
- Sbc1.customers.adatum.biz – the derived trunk in a customer tenant that does not need to be created in PowerShell. You can simply add the name of the derived trunk in the customer tenant in the online voice routing policy without creating it.
- Carrier will need to setup DNS record resolving derived trunk FQDN to carrier SBC ip address.
- Any changes made on a carrier trunk (on carrier tenant) is automatically applied to derived trunks. For example, carriers can change an SIP port on the carrier trunk, and this change applies to all derived trunks. New logic to configure the trunks simplifies the management as you don't need to go to every tenant and change the parameter on every trunk.
- The options are sent only to the carrier trunk FQDN. The health status of the carrier trunk is applied to all derived trunks and is used for routing decisions. Find out more about Direct Routing options.
- The carrier can drain the carrier trunk, and all derived trunks will be drained as well.

Migration from the previous model to the carrier trunk

For migration from the current implementation of the carrier hosted model to the new model, the carriers will need to reconfigure the trunks for customer tenants. Remove the trunks from the customer tenants using Remove-CSOnlinePSTNGateway (leaving the trunk in the carrier tenant)-

We highly encourage migrating to the new solution as soon as possible as we will be enhancing monitoring and provisioning using the carrier and derived trunk model.

Please refer to the SBC vendor instructions on configuring sending the FQDN name of subdomains in the Contact header.

Considerations for setting up muti-tenant failover

To set up failover for a multi-tenant environment, you'll need to do the following:

- For each tenant, add the FQDNs for two different SBCs. For example:

  customer1.sbc1.contoso.com
  customer1.sbc2.contoso.com

- In the Online Voice Routing policies of the users, specify both SBCs. If one SBC fails, the routing policy will route calls to the second SBC.

See also

Plan Direct Routing

Configure Direct Routing

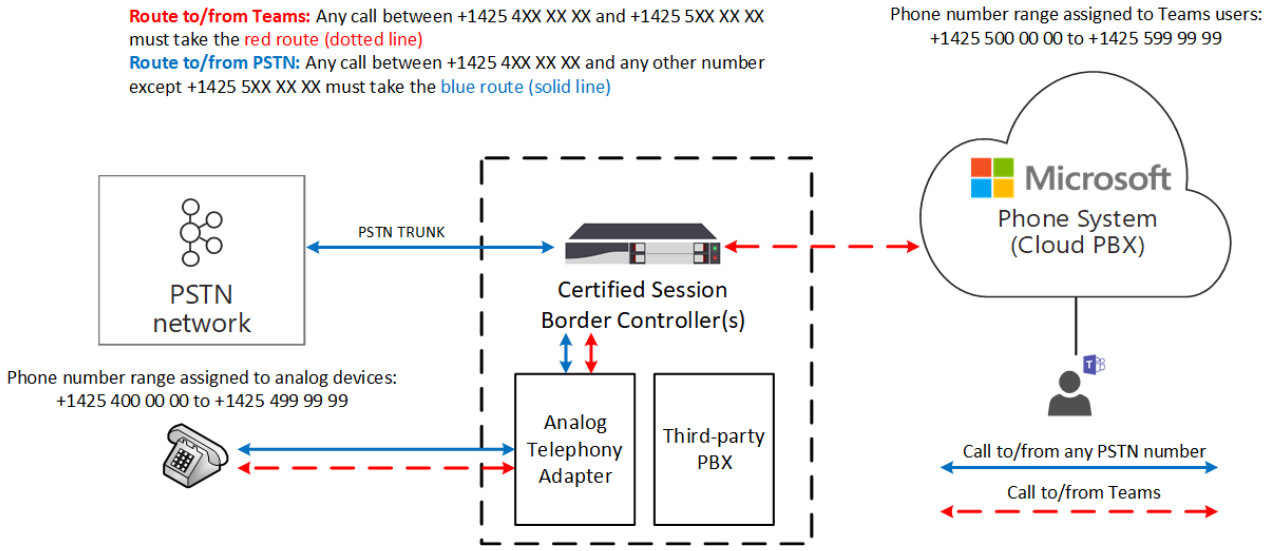
How to use analog devices with Phone System Direct Routing

10/6/2020 • 4 minutes to read • Edit Online

This article describes how to use analog devices with Phone System Direct Routing. To connect analog devices to Direct Routing, you must use an Analog Telephony Adapter (ATA), and this adapter must be supported by the certified Session Border Controller (SBC) vendor.

When a user makes a call from an analog device, the signaling and media flow through the Analog Telephony Adapter (ATA) to the SBC. The SBC sends the call to a Microsoft Teams endpoint or to the Public Switched Telephone Network (PSTN) based on the internal routing table. When a device makes a call, the route it takes depends on the routing policies created for the device.

In the following diagram, Direct Routing is configured so that any Teams calls to and from the numbers between +1425 4XX XX XX and +1425 5XX XX XX must take the red route (dotted line), and any PSTN call to and from numbers between +1425 4XX XX XX and any other number except number range +1425 5XX XX XX must take the blue route (solid line).



Example: How to configure the use of analog devices with Direct Routing

To configure the use of analog devices with Direct Routing, you must connect the Analog Telephony Adapter to the SBC, and configure the SBC to work with Direct Routing.

This example walks you through the following steps:

1. Connect the SBC to Direct Routing.
2. Create the PSTN Usage.
3. Create a voice route and associate it with the PSTN Usage.
4. Assign the voice route to the PSTN Usage.
5. Enable the online user.
6. Assign the voice route policy to the user.
7. Create a voice route for an analog device.

For information on how to connect an ATA to an SBC and configure the SBC, see your SBC manufacturer configuration guide:

- AudioCodes configuration documentation
- Ribbon configuration documentation

Step 1. Connect the SBC to Direct Routing

The following command configures the SBC connection as follows:

- FQDN sbc.contoso.com
- Signaling port 5068
- Media bypass mode
- Call history information forwarded to the SBC-
- P-Asserted-Identity (PAI) header forwarded along with the call

```
PS C:\> New-CsOnlinePSTNGateway -FQDN sbc.contoso.com -SIPSignalingPort 5068 -ForwardCallHistory $true -
ForwardPAI $true -MediaBypass $true -Enabled $true
```

Step 2: Create the PSTN usage

The next command creates an empty PSTN usage. Online PSTN usages are string values that are used for call authorization. An online PSTN usage links an online voice policy to a route. This example adds the string "Interop" to the current list of available PSTN usages.

```
PS C:\> Set-CsOnlinePstnUsage -Identity global -Usage @{add="Interop"}
```

Step 3: Create a voice route and associate it with the PSTN usage:

This command creates a new online voice route with the identity "analog-interop" for the number range +1425 XXX XX XX. The voice route is applicable to a list of online gateways sbc.contoso.com and associates the route with online PSTN usage "Interop". A voice route includes a regular expression that identifies which phone numbers will be routed through a given voice route:

```
PS C:\> New-CsOnlineVoiceRoute -Identity analog-interop -NumberPattern "^\+1(425)(\d{7}])$" -
OnlinePstnGatewayList sbc.contoso.com -Priority 1 -OnlinePstnUsages "Interop"
```

Step 4: Assign the voice route to the PSTN usage:

This command creates a new online per-user voice routing policy with the Identity "AnalogInteropPolicy". This policy is assigned a single online PSTN usage: "Interop".

```
PS C:\> New-CsOnlineVoiceRoutingPolicy -Identity "AnalogInteropPolicy" -Name "AnalogInteropPolicy" -
OnlinePstnUsages "Interop"
```

Step 5: Enable the online user

This command modifies the user account with the Identity exampleuser@contoso.com. In this case, the account is modified to enable Enterprise Voice, the Microsoft implementation of VoIP, with enabled voice mail and assigns the number +14255000000 to this user. This command should be run for each Teams user (excluding ATA device users)

in the company tenant.

```
PS C:\> Set-CsUser -Identity "exampleuser@contoso.com" -EnterpriseVoiceEnabled $True -HostedVoiceMail $True -
OnPremLineUri "tel:+14255000000"
```

Step 6: Assign the voice route policy to a user

This command assigns the per-user online voice routing policy AnalogInteropPolicy to the user with the identity exampleuser@contoso.com. This command should be run for each Teams user (excluding ATA device users) in the company tenant.

```
PS C:\> Grant-CsOnlineVoiceRoutingPolicy -Identity "exampleuser@contoso.com" -PolicyName "AnalogInteropPolicy"
```

Step 7: Create a voice route for an analog device

This command creates an online voice route with identity “analog-interop” for number range +1425 4XX XX XX applicable to a list of online gateways sbc.contoso.com and associates it with online PSTN usage “Interop”. This command should be run for each analog device with appropriate phone number pattern. Alternatively, a proper number pattern for analog devices can be used while configuring the online voice route during one of the previous steps.

```
PS C:\> New-CsOnlineVoiceRoute -Identity analog-interop -NumberPattern "^\+1(4254)(\d{6}])$"  -
OnlinePstnGatewayList sbc.contoso.com -Priority 1 -OnlinePstnUsages "Interop"
```

Considerations

- Unless otherwise note, an analog device is any device that can send DTMF digits to place a call. For example, analog phones, fax machines, and overhead pagers.
- Analog phones connected to an ATA are not searchable from Teams. Teams users must manually enter the phone number associated with the device to call that device.

See also

Plan Direct Routing

Configure Direct Routing

Plan Location-Based Routing for Direct Routing

8/24/2020 • 17 minutes to read • Edit Online

Overview of Location-Based Routing

In some countries and regions, it's illegal to bypass the Public Switched Telephone Network (PSTN) provider to decrease long-distance calling costs. This article describes how to use Location-Based Routing to restrict toll bypass for Microsoft Teams users based on their geographic location. This article applies only to Phone System Direct Routing.

Here you'll get an overview of Location-Based Routing and guidance to help you plan for it. When you're ready to apply and enable Location-Based Routing, see:

- Deploy network settings for Location-Based Routing
- Enable Location-Based Routing for Direct Routing

> **NOTE**
> Location-Based Routing isn't available in Microsoft 365 Government Community Cloud (GCC) High or DoD deployments.

Location-Based Routing is a feature that lets you restrict toll bypass based on policy and the user's geographic location at the time of an inbound or outbound PSTN call. Location-Based Routing is intended to provide a mechanism to prevent toll bypass. It shouldn't be used as a mechanism to dynamically route PSTN calls based on the location of the user or unintended consequences may result.

When a Teams user is enabled for Location-Based Routing, the following applies:

- To make an outbound PSTN call, one of the following must be true:
  - The user's endpoint is located in a network site that's enabled for Location-Based Routing and calls egress through the corresponding gateway that's enabled for Location-Based Routing.
  - The user's endpoint is located in a network site that's not enabled for Location-Based Routing and calls egress through a gateway that's not enabled for Location-Based Routing.

  Outbound calls aren't allowed in any other scenario.
- To receive an inbound PSTN call, the user's answering endpoint must be located in the same network site where the call ingresses through the gateway that's enabled for Location-Based Routing. In any other scenario, such as if the user is roaming, the call isn't allowed and is routed to the user's call forwarding settings (typically voicemail).
- To transfer a PSTN call to another Teams user, the target user's endpoint must be located in the same network site as the user who initiates the transfer. Transfers aren't allowed in any other scenario.
- To transfer another Teams user to the PSTN, the call must be transferred through a Location-Based Routing enabled gateway located at the same network site as the initial caller. Transfers aren't allowed in any other scenario.

Location-Based Routing uses the same network region, site, and subnet definitions that Skype for Business Server uses. When toll bypass is restricted for a location, an admin associates each IP subnet and each PSTN gateway for that location to a network site. A user's location is determined by the IP subnet that the user's Teams endpoints are connected to at the time of a PSTN call. A user may have multiple Teams clients located at different sites, in which case Location-Based Routing enforces each client's routing separately depending on the location of its

endpoint.

To get familiar with some of the network terminology used in this article, see Network settings for cloud voice features in Teams.

Apply Location-Based Routing

You must apply Location-Based Routing to users, network sites, and PSTN gateways.

Apply Location-Based Routing at the user location

As mentioned earlier, Location-Based Routing only applies to users who are set up for Direct Routing. Location-Based Routing doesn't apply to users who are set up for Calling Plan. Users must be enabled for Location-Based Routing if they are under toll bypass restriction, which controls the conditions in which they can make and receive PSTN calls and the PSTN gateway that can be used. When a user who is enabled for Location-Based Routing is located at a site that's enabled for Location-Based Routing, the user must make calls through a Location-Based Routing enabled gateway connected to the site.

Location-Based Routing works by determining the user's current location based on the IP address of the user's Teams endpoint and applies the rules accordingly. The location of a user who is enabled for Location-Based Routing can be categorized in the following ways:

- **The user is located at the same Location-Based Routing enabled site associated to the PSTN gateway where their DID is assigned.**
  In this scenario, the user is located in a known network site that's enabled for Location-Based Routing and the user's Direct Inward Dial (DID) number terminates on a PSTN gateway that's in the same network site. For example, the user is at their office.
- **The user is located at a different Location-Based Routing enabled site not associated to PSTN gateway where their DID is assigned.**
  In this scenario, the user is located in a known network site that's enabled for Location-Based Routing, and that site isn't associated with the PSTN gateway where the user's DID number is assigned. For example, the user travels to another office.
- **The user is located at an internal site that's not enabled for Location-Based Routing.**
  In this scenario, the user is located in a known internal network site that's not enabled for Location-Based Routing.
- **The user is located at an unknown site.**
  - The user is located within the internal network that's not defined as a network site.
  - The user is located outside the internal network. For example, the user is on the Internet at home or in a coffee shop.

Apply Location-Based Routing at the network site

Network sites must be enabled for Location-Based Routing to help determine which gateways to route Location-Based Routing enabled users when roaming. If a user who is enabled for Location-Based Routing roams to an site that's enabled for Location-Based Routing, only the PSTN gateway that's enabled for Location-Based Routing at that site can be used for outbound calls. If a user who is enabled for Location-Based Routing roams to a site that's not enabled for Location-Based Routing, any gateway that's not enabled for Location-Based Routing can be used for outbound calls.

Apply Location-Based Routing at the PSTN gateway

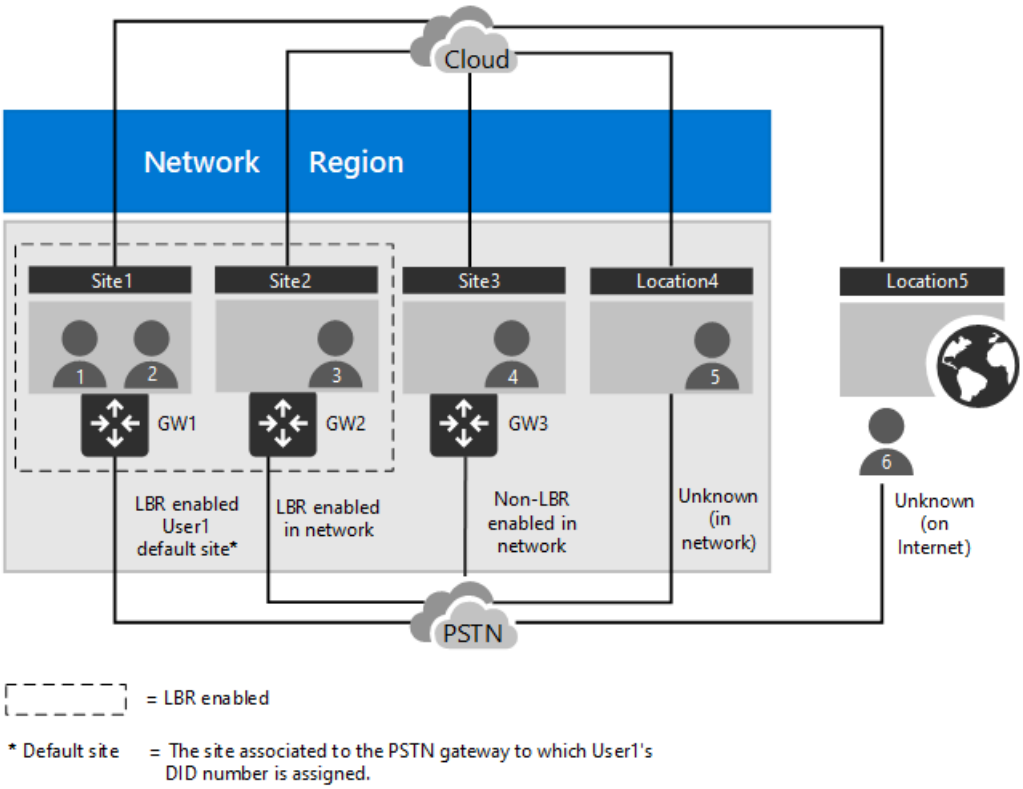
Gateways are associated to sites to determine where a user who is enabled for Location-Based Routing can be located when they make or receive a PSTN call. Gateways must be enabled for Location-Based Routing to ensure that it's under toll bypass restrictions and can't be used by users who aren't enabled for Location-Based Routing. The same gateway may be associated to multiple sites and it can be configured to be enabled for Location-Based Routing or not enabled for Location-Based Routing, depending on the site.

Scenarios for Location-Based Routing

This section describes different scenarios for restricting toll bypass by using Location-Based Routing and compares how calls are routed for users who aren't enabled for Location-Based Routing with users who are enabled for Location-Based Routing.

- Teams user places an outbound call to the PSTN
- Teams user receives an inbound call from the PSTN
- Teams user transfers or forwards call to another Teams user
- Teams user transfers or forwards call to PSTN endpoint
- Simultaneous ringing
- Delegation

The following diagram shows the restrictions enabled by Location-Based Routing in each scenario. Users, network sites, and gateways that are enabled for Location-Based Routing have a border around them. Use the diagram as a guide to help you understand how Location-Based Routing works in each scenario.



Teams user places an outbound call to the PSTN

User not enabled for Location-Based Routing

A user who isn't enabled for Location-Based Routing can make outbound calls using any gateway at any site that's not enabled for Location-Based Routing through their assigned voice routing policy. However, if a gateway is enabled for Location-Based Routing, the user can't make outbound calls through the gateway even if it's assigned to their voice routing policy. If the user roams to a site that's enabled for Location-Based Routing, they can only make calls through their normal routing gateways that aren't enabled for Location-Based Routing.

User enabled for Location-Based Routing

In comparison, the routing of outbound calls for users who are enabled for Location-Based Routing is affected by the network location of the user's endpoint. The following table shows how Location-Based Routing affects the routing of outbound calls of User1, depending on the location of User1.

USER1 ENDPOINT LOCATION	ROUTING OF OUTBOUND CALLS FOR USER1
Same site where user's DID is assigned, site enabled for Location-Based Routing (Site1)	Call routed through gateway that's enabled for Location-Based Routing (GW1) at Site1, based on the user's voice routing policy
Different site than where user's DID is assigned, site enabled for Location-Based Routing (Site2)	Call routed through gateway that's enabled for Location-Based Routing (GW2) at roam Site2, based on user's voice routing policy
Different site than where user's DID is assigned, site not enabled for Location-Based Routing (Site3)	Call routed through gateway that's not enabled for Location-Based Routing at site that's not enabled for Location-Based Routing (GW3), based on user's voice routing policy
Unknown internal network (Location4)	PSTN calling not allowed
Unknown external network (Location5)	PSTN calling not allowed

Teams user receives an inbound call from the PSTN

User not enabled for Location-Based Routing

A user who isn't enabled for Location-Based Routing can receive an inbound call from the gateway that's not enabled for Location-Based Routing from which their assigned DID number ingresses. If the user roams to a site that's not enabled for Location-Based Routing, they can still receive calls through their normal PSTN gateways.

User enabled for Location-Based Routing

In comparison, users enabled for Location-Based Routing can only receive inbound calls from the PSTN gateway their DID is assigned to when they are located at the same site. The following table shows how User1 receives inbound calls when User1 moves to different network locations. If the call isn't routed to the endpoint of the user, it goes to the user's call forwarding settings, if the settings are configured. Typically, this is voicemail.

USER1 ENDPOINT LOCATION	ROUTING OF INBOUND CALLS TO USER1
Same site as where user's DID is assigned, site enabled for Location-Based Routing (Site1)	Calls routed to User1's endpoint in Site1
Different site than where user's DID is assigned, site enabled for Location-Based Routing (Site2)	Calls not routed to endpoints in Site2
Different site than where user's DID is assigned, site not enabled for Location-Based Routing (Site3)	Calls not routed to endpoints in Site3
Unknown internal network (Location4)	Calls not routed to endpoints in Location4
Unknown external network (Location5)	Calls not routed to endpoints in Location5

Teams user transfers or forwards call to another Teams user

When a PSTN endpoint is involved, Location-Based Routing analyzes whether one or both users are enabled for Location-Based Routing and determines whether the call should be transferred or forwarded depending on the location of both endpoints.

Call transfer requires the initiating user to pick up the call while call forwarding doesn't require the initial call to be answered. This means that calls can be forwarded even if User1 isn't at a location to receive inbound calls (see the table in the Teams user receives an inbound call from the PSTN section) and calls can't be transferred if User1 is unable to receive the inbound call.

User not enabled for Location-Based Routing

A user who isn't enabled for Location-Based Routing can transfer or forward PSTN calls to other users who aren't enabled for Location-Based Routing. The user will typically not be allowed to transfer or forward a PSTN call to a user who is enabled for Location-Based Routing because Location-Based Routing enabled users are generally only allowed to be co-located at Location-Based Routing enabled gateways for PSTN calls. The exception is when a Location-Based Routing enabled user roams to a site that's not enabled for Location-Based Routing. In this scenario, the transferred call is allowed.

Likewise, a user who isn't enabled for Location-Based Routing can only receive a transfer or forwarded PSTN call from another user who isn't enabled for Location-Based Routing.

User enabled for Location-Based Routing

Generally, transferring and forwarding inbound PSTN calls from a gateway that's enabled for Location-Based Routing is allowed only if the target user is enabled for Location-Based Routing and is located at the same site. Otherwise, transferring and forwarding calls isn't allowed.

The following table shows whether call forwarding and call transfers are allowed, depending on the location of the target user. In this table, User1, located in Site1, initiates the transfer or forward to other Teams users who are also enabled for Location-Based Routing and who are in different locations.

TARGET USER ENDPOINT LOCATION	USER1 INITIATES CALL TRANSFER	USER1 INITIATES CALL FORWARD
Same network site as initiator (User2)	Allowed	Allowed
Different network site, site enabled for Location-Based Routing (User3)	Not allowed	Not allowed
Different network site, site not enabled for Location-Based Routing (User4)	Not allowed	Not allowed
Unknown internal network (User5)	Not allowed	Not allowed
Unknown external network (User6)	Not allowed	Not allowed

Teams user transfers or forwards call to PSTN endpoint

User not enabled for Location-Based Routing

- Transferring and forwarding a PSTN call to another PSTN number is allowed.
- Transferring and forwarding an inbound VOIP call to the PSTN must honor the caller's toll bypass restrictions.
  - If the caller isn't enabled for Location-Based Routing, they can be transferred to any PSTN gateway that's not enabled for Location-Based Routing.
  - If the caller is enabled for Location-Based Routing, they can only be transferred to a Location-Based Routing enabled gateway located at the same network site.

User enabled for Location-Based Routing

- Transferring and forwarding inbound a PSTN call to another PSTN number must be routed out the same Location-Based Routing enabled gateway that the inbound call arrived on.
- Transferring and forwarding an inbound VOIP call to the PSTN must honor both the caller and called user's toll bypass restrictions.
  - If the caller isn't enabled for Location-Based Routing, they can be transferred to any PSTN gateway that's not enabled for Location-Based Routing.
  - If the caller is enabled for Location-Based Routing, they can be only be transferred to a Location-Based Routing enabled gateway located at the same network site.

The following table shows how Location-Based Routing affects routing of a VOIP call from User1 at Site1 to users

in different locations who transfer or forward the call to a PSTN endpoint.

USER INITIATING CALL TRANSFER OR FORWARD	TRANSFER TO PSTN	FORWARD TO PSTN
Same network site, site enabled for Location-Based Routing (User2)	Call transfer can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User2's voice routing policy	Call forward can only routed through Location-Based Routing enabled Gateway1 at Site1, based on User2's voice routing policy
Different network site, site enabled for Location-Based Routing (User3)	Call transfer can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User3's voice routing policy	Call forward can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User3's voice routing policy
Different network site, site not enabled for Location-Based Routing (User4)	Call transfer can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User4's voice routing policy	Call forward can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User4's voice routing policy
Unknown internal network (User5)	Call transfer can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User5's voice routing policy	Call forward can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User5's voice routing policy
Unknown external network (User6)	Call transfer can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User6's voice routing policy	Call forward can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User6's voice routing policy

Simultaneous ringing

When a user who's enabled for Location-Based Routing receives a call and has simultaneous ringing enabled, Location-Based Routing analyzes the location of the calling party and the endpoints of the called parties to determine whether the call should be routed. Simultaneous ringing follows the same Location-Based rules as call transfers and forwards.

Simultaneous ringing for another Teams user

The following table shows whether Location-Based Routing allows simultaneous ringing to different users for an inbound PSTN call for User1.

TARGET USER ENDPOINT LOCATION	SIMULTANEOUS RING
Same network site as initiator (User2)	Allowed
Different roamed network site enabled for Location-Based Routing (User3)	Not allowed
Roamed network site not enabled for Location-Based Routing (User4)	Not allowed
Unknown internal network (User5)	Not allowed
Unknown external network (User6)	Not allowed
Target user is a PSTN number	Call can only be routed through Location-Based Routing enabled Gateway1 at Site1, based on User1's voice routing policy

Simultaneous ringing to a PSTN endpoint

The following table shows Location-Based Routing behavior for an inbound VOIP call from User1 located at Site1 to users in different locations with simultaneous ring set to a PSTN number.

CALLED USER ENDPOINT LOCATION	SIMULTANEOUS RING TARGET IS PSTN ENDPOINT
Same network site, site enabled for Location-Based Routing (User2)	Call can be only be routed through Location-Based Routing Gateway1 at Site1, based on User2's voice routing policy
Different network site enabled for Location-Based Routing (User3)	Call can only be routed through Location-Based Routing Gateway1 at Site1, based on User3's voice routing policy
Different network site not enabled for Location-Based Routing (User4)	Call can only be routed through Location-Based Routing Gateway1 at Site1, based on User4's voice routing policy
Unknown internal network (User5)	Call can only be routed through Location-Based Routing Gateway1 at Site1, based on User5's voice routing policy
Unknown external network (User6)	Call can only be routed through Location-Based Routing Gateway1 at Site1, based on User6's voice routing policy

Inbound calls through voice app (Auto Attendant or Call Queue)

Inbound PSTN calls from a Location-Based Routing enabled gateway are allowed to connect to an auto attendant or call queue. Users enabled for Location-Based Routing can only receive inbound call transfers from these applications when they are located at the same site the inbound PSTN call originates from.

Call forwarding and simultaneous ringing to users and PSTN is allowed for voice app transfers. Completing the call to the target is subject to the same Location-Based Routing rules listed earlier.

Forwarding to voicemail is also allowed.

Delegation

A Teams user may choose delegates who can make and receive calls on their behalf. Delegation capabilities in Teams are affected by Location-Based Routing as follows:

- For outbound calls from a Location-Based Routing enabled delegate on behalf of a delegator, the same rules apply. Call routing is based on the delegate's call authorization policy, voice routing policy, and location. For more information, see Teams user places an outbound call to the PSTN.
- For inbound PSTN calls to a delegator, the same Location-Based Routing rules that apply for call forwarding or simultaneously ringing to other users also apply to delegates. For more information, see Teams user transfers or forwards call to another Teams user, Teams user transfers or forwards call to PSTN endpoint, and Simultaneous ringing. When a delegate sets a PSTN endpoint as a simultaneous ring target, the voice routing policy of the delegate is used to route the call to the PSTN.
- For delegation, it's recommended that the delegator and associated delegates be located in the same network site.

Other planning considerations

Changes from an on-premises Location-Based Routing deployment

Network site voice routing policy is no longer used. Instead, we use the user's voice routing policy. This means that to allow users to roam to other sites, the voice routing policy must include the gateways of the roamed sites.

Technical considerations for Location-Based Routing

IPv4 and IPv6 subnets are supported, however, IPv6 takes precedence when checking for a match.

Client support for Location-Based Routing

The following Teams clients are supported:

- Teams desktop clients (Windows and Mac)
- Teams mobile clients (iOS and Android)
- Teams IP phones

The Teams web client and Skype for Business clients aren't supported.

Capabilities not supported by Location-Based Routing

Location-Based Routing doesn't apply to the following types of interactions. Location-Based Routing isn't enforced when Teams endpoints interact with PSTN endpoints in the following scenarios:

- Call park or retrieval of PSTN calls through Call Park
- An on-premises Skype for Business user or a Skype for Business Online user calls a Teams user

Location-Based Routing for conferencing

A Location-Based Routing enabled user on a PSTN call isn't allowed to start a conference with another user or PSTN number. Connecting to auto attendants or call queues is allowed. If the user has a conferencing license, the user must start a conference with the relevant users and call the PSTN through the conference bridge to start a conference call.

Media bypass requirement for Location-Based Routing

If you're deploying Location-Based Routing in India, it's a requirement to also configure media bypass. To learn more, see Plan for media bypass with Direct Routing and Local Media Optimization for Direct Routing.

Direct Voice over IP (VoIP)

Direct Voice over IP (VoIP) must not be deployed with any telephony equipment in India.

Next steps

Go to Configure network settings for Location-Based Routing.

Related topics

- Enable Location-Based Routing for Direct Routing
- Network settings for cloud voice features in Teams

Configure network settings for Location-Based Routing

7/22/2020 • 2 minutes to read • Edit Online

If you haven't already done so, read Plan Location-Based Routing for Direct Routing to review other steps you'll need to take before you configure network settings for Location-Based Routing.

This article describes how to configure network settings for Location-Based Routing. After you deploy Phone System Direct Routing in your organization, the next steps are to create and set up network regions, network sites, and network subnets.

Define network regions

A network region contains a collection of network sites and interconnects various parts of a network across multiple geographic areas. For steps on how to configure network regions, go to Manage your network topology for cloud features in Teams.

Define network sites

A network site represents a location where your organization has a physical venue, such as an office, a set of buildings, or a campus. You must associate each network site in your topology with a network region. For steps on how to configure network sites, see Manage your network topology for cloud features in Teams.

A best practice for Location-Based Routing is to create a separate site for each location that has unique PSTN connectivity. You can create a site that's enabled for Location-Based Routing or a site that's not enabled for Location-Based Routing. For example, you may want to create a site that's not enabled for Location-Based Routing to allow users who are enabled for Location-Based Routing to make PSTN calls when they roam to that site.

Define network subnets

Each subnet must be associated with a specific network site. You can associate multiple subnets with the same network site but you can't associate multiple sites with the same subnet. For steps on how to configure network subnets, go to Manage your network topology for cloud features in Teams.

For Location-Based Routing, IP subnets at the location where Teams endpoints can connect to the network must be defined and associated to a defined network to enforce toll bypass. This association of subnets enables Location-Based Routing to locate the endpoints geographically to determine whether a given PSTN call should be allowed. Both IPv6 and IPv4 subnets are supported. When determining whether a Teams endpoint is located at a site, Location-Based Routing first checks for a matching IPv6 address. If an IPv6 address isn't present, Location-Based Routing checks for an IPv4 address.

Define trusted IP addresses (external subnets)

Trusted IP addresses are the internet external IP addresses of the enterprise network and are used to determine whether the user's endpoint is inside the corporate network. For steps on how to configure trusted IP addresses, go to Manage your network topology for cloud features in Teams.

If the user's external IP address matches an IP address that's in the trusted IP address list, Location-Based Routing checks to determine the internal subnet where the user's endpoint is located. If the user's external IP address doesn't match any IP address that's defined in the trusted IP address list, the endpoint is classified as being at an

unknown location and any PSTN calls to or from a user who is enabled for Location-Based Routing are blocked.

Next steps

Go to Enable Location-Based Routing for Direct Routing.

Related topics

- Network settings for cloud voice features in Teams

Enable Location-Based Routing for Direct Routing

7/22/2020 • 5 minutes to read • Edit Online

Before you follow the steps in this article, make sure you've read Plan Location-Based Routing for Direct Routing and completed the steps in Configure network settings for Location-Based Routing.

This article describes how to enable Location-Based Routing for Direct Routing. After you deploy Phone System Direct Routing and set up network regions, sites, and subnets, you're ready to enable Location-Based Routing. To complete the steps in this article, you'll need some familiarity with PowerShell cmdlets. To learn more, see Teams PowerShell Overview.

You have to enable Location-Based Routing for the following:

- Users
- Network sites
- Gateway configurations
- Calling policies

You can use the Microsoft Team admin center or PowerShell to enable Location-Based Routing.

Using the Microsoft Teams admin center

Enable Location-Based Routing for users

1. Create a voice routing policy and assign PSTN usages to the policy. When you assign PSTN usages to a policy, make sure you do one of the following:
   - Use PSTN usages associated to voice routes that use a PSTN gateway local to the site.
   - Use PSTN usages associated to voice routes that use a PSTN gateway located in a region where Location-Based Routing restrictions aren't needed.
2. Assign the voice routing policy to users who require routing restrictions to be enforced.

To learn more about how to create voice routing policies and assign them to users, see Manage voice routing policies in Microsoft Teams.

Enable Location-Based Routing for network sites

Enable Location-Based Routing for your sites that need to enforce routing restrictions. To do this, in the left navigation of the Microsoft Teams admin center, go to **Locations** > **Network topology**, select a network site, click **Edit**, and then turn on **Location based routing**.

To learn more, see Manage your network topology.

Enable Location-Based Routing for gateways

Enable Location-Based Routing to gateways that route calls to PSTN gateways that route calls to the PSTN, and associate the network site where the gateway is located.

1. In the left navigation, go to **Voice** > **Direct Routing**, and then click the **SBCs** tab.
2. Select the SBC, and then click **Edit**.
3. Under **Location based routing and media optimization**, turn on **Enable location based routing**.
4. Specify the gateway site ID, and then set the bypass mode.
5. Click **Save**.

Enable Location-Based Routing for calling policies

To enforce Location-Based Routing for specific users, set up the user's calling policy to prevent PSTN toll bypass. To do this, turn on the **Prevent toll bypass** setting in the calling policy.

To learn more, see Calling policies in Teams.

Using PowerShell

Enable Location-Based Routing for users

1. Use the Set-CsOnlinePstnUsage cmdlet to set PSTN usages. For multiple usages, separate each usage with a comma.

   ```
   Set-CsOnlinePstnUsage -Usage <usages>
   ```

   For example:

   ```
   Set-CsOnlinePstnUsage -Usage "Long Distance", "Local", "Internal"
   ```

2. Use the New-CsOnlineVoiceRoutingPolicy cmdlet to create a voice routing policy to associate the user with the appropriate PSTN usages.

   ```
   New-CsOnlineVoiceRoutingPolicy -Identity <voice routing policy ID> -Description <voice routing policy name> -OnlinePstnUsages <usages>
   ```

   When you assign PSTN usages to a voice routing policy, make sure you do one of the following:

   - Use PSTN usages associated to voice routes that use a PSTN gateway local to the site
   - Use PSTN usages associated to voice routes that use a PSTN gateway located in a region where Location-Based Routing restrictions aren't needed.

   In this example, we create two new voice routing policies and assign PSTN usages to them.

   ```
   New-CsOnlineVoiceRoutingPolicy -Identity "DelhiVoiceRoutingPolicy" -Description "Delhi voice routing policy" -OnlinePstnUsages "Long Distance"
   New-CsOnlineVoiceRoutingPolicy -Identity "HyderabadVoiceRoutingPolicy" -Description " Hyderabad voice routing policy" -OnlinePstnUsages "Long Distance", "Local", "Internal"
   ```

   The following table shows the voice routing policies defined in this example.

	VOICE ROUTING POLICY 1	VOICE ROUTING POLICY 2
Online voice policy ID	Delhi online voice routing policy	Hyderabad online voice routing policy
Online PSTN usages	Long Distance	Long Distance, Local, Internal

3. Use the Grant-CsOnlineVoiceRoutingPolicy cmdlet to associate online voice routing policies to users who require routing restrictions to be enforced.

   ```
   Grant-CsOnlineVoiceRoutingPolicy -Identity <User> -Tenant <TenantId>
   ```

Enable Location-Based Routing for network sites

1. Use the Set-CsTenantNetworkSite cmdlet to enable Location-Based Routing and associate voice routing policies to your network sites that need to enforce routing restrictions.

```
Set-CsTenantNetworkSite -Identity <site ID> -EnableLocationBasedRouting <$true|$false>
```

   In this example, we enable Location-Based Routing for the Delhi site and the Hyderabad site.

```
Set-CsTenantNetworkSite -Identity "Delhi" -EnableLocationBasedRouting $true
Set-CsTenantNetworkSite -Identity "Hyderabad" -EnableLocationBasedRouting $true
```

   The following table shows the sites enabled for Location-Based Routing in this example.

	SITE 1 (DELHI)	SITE 2 (HYDERABAD)
Site name	Site 1 (Delhi)	Site 2 (Hyderabad)
EnableLocationBasedRouting	True	True
Subnets	Subnet 1 (Delhi)	Subnet 2 (Hyderabad)

Enable Location-Based Routing for gateways

1. Use the New-CsOnlinePSTNGateway cmdlet to create a gateway configuration for each gateway or network site.

```
New-CSOnlinePSTNGateway -Fqdn <FDQN registered for the SBC> -Identity <gateway configuration ID> -
SipSignalingPort <listening port used> -Enabled $true
```

   If multiple gateways are associated with a system (for example, Gateway or PBX), modify each gateway to enable Location-Based Routing restrictions.

   In this example, we create one gateway configuration for each gateway.

```
New-CsOnlinePSTNGateway -Fqdn sbc.contoso.com -Enabled $true -SipSignalingPort 5067
```

   For more information, see Configure Direct Routing.

2. Use the Set-CSOnlinePSTNGateway cmdlet to enable Location-Based Routing for your gateways that need to enforce routing restrictions.

   Enable Location-Based Routing to gateways that route calls to PSTN gateways that route calls to the PSTN, and associate the network site where the gateway is located.

```
Set-CSOnlinePSTNGateway -Identity <gateway configuration ID> -GatewaySiteLbrEnabled $true -
GatewaySiteID <site ID>
```

   In this example, we enable Location-Based Routing for each gateway that's associated to PSTN gateways in the Delhi and Hyderabad sites.

```
Set-CSOnlinePSTNGateway -Identity sbc.contoso.com  -GatewaySiteLbrEnabled $true –GatewaySiteID "Delhi"
Set-CSOnlinePSTNGateway -Identity sbc1.contoso.com  -GatewaySiteLbrEnabled $true -GatewaySiteID
"Hyderabad"
```

Don't enable Location-Based Routing for gateways that don't route calls to the PSTN. However, you still have to associate the gateway to the network site where the system is located. This is because Location-Based Routing restrictions need to be enforced for PSTN calls reaching endpoints that are connected via this gateway. In this example, Location-Based Routing isn't enabled for each gateway that's associated to PBX systems in the Delhi and Hyderabad sites.

```
Get-CSONlinePSTNGateway -Identity sbc.contoso.com

Identity: sbc.contoso.com
GatewaySiteLbrEnabled: $false

Get-CSONlinePSTNGateway -Identity sbc2.contoso.com

Identity: sbc2.contoso.com
GatewaySiteLbrEnabled: $false
```

Enable Location-Based Routing for calling policies

To enforce Location-Based Routing for specific users, set up the users' voice policy to prevent PTSN toll bypass.

Use the Grant-CsTeamsCallingPolicy cmdlet to enable Location-Based routing by preventing PSTN toll bypass.

```
Grant-CsTeamsCallingPolicy -PolicyName <policy name> -id <user id>
```

In this example, we prevent PSTN toll bypass to User1's calling policies.

```
Grant-CsTeamsCallingPolicy –PolicyName "AllowCallingPreventTollBypass" -id "User1"
```

Related topics

- Network settings for cloud voice features in Teams

Plan for media bypass with Direct Routing

11/2/2020 • 13 minutes to read • Edit Online

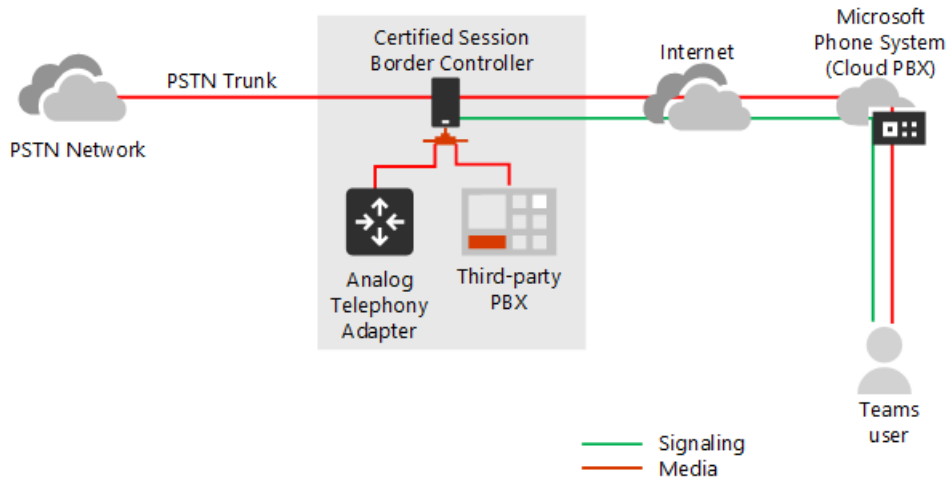
About media bypass with Direct Routing

Media bypass enables you to shorten the path of media traffic and reduce the number of hops in transit for better performance. With media bypass, media is kept between the Session Border Controller (SBC) and the client instead of sending it via the Microsoft Phone System. To configure media bypass, the SBC and the client must be in the same location or network.

You can control media bypass for each SBC by using the **Set-CSOnlinePSTNGateway** command with the **-MediaBypass** parameter set to true or false. If you enable media bypass, this does not mean that all media traffic will stay within the corporate network. This article describes the call flow in different scenarios.

The diagrams below illustrate the difference in call flow with and without media bypass.

Without media bypass, when a client makes or receives a call, both signaling and media flow between the SBC, the Microsoft Phone System, and the Teams client, as shown in the following diagram:

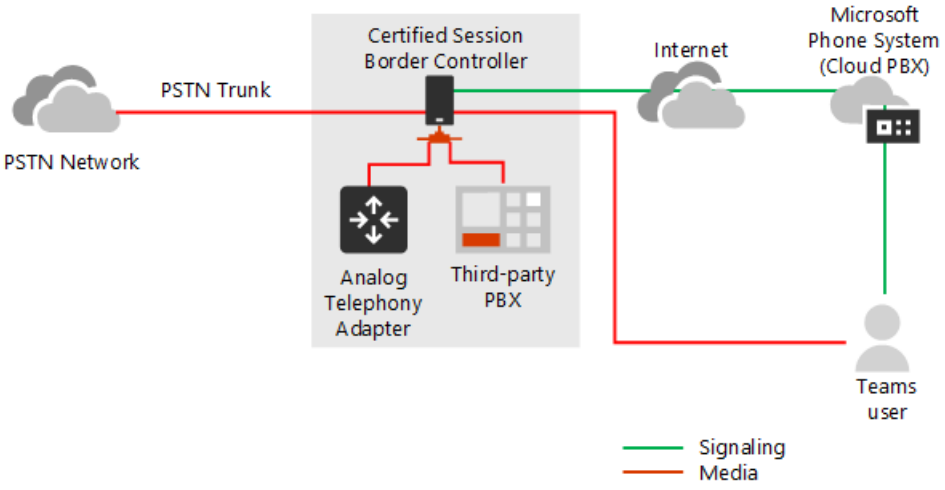


But let's assume that a user is in the same building or network as the SBC. For example, assume a user who is in a building in Frankfurt makes a call to a PSTN user:

- **Without media bypass**, media will flow via either Amsterdam or Dublin (where Microsoft datacenters are deployed) and back to the SBC in Frankfurt.

  The datacenter in Europe is selected because the SBC is in Europe, and Microsoft uses the datacenter closest to the SBC. While this approach does not affect call quality due to optimization of traffic flow within Microsoft networks in most geographies, the traffic has an unnecessary loop.

- **With media bypass**, the media is kept directly between the Teams user and the SBC as shown in the following diagram:



Media bypass leverages protocols called Interactive Connectivity Establishment (ICE) on the Teams client and ICE lite on the SBC. These protocols enable Direct Routing to use the most direct media path for optimal quality. ICE and ICE Lite are WebRTC standards. For detailed information about these protocols, see RFC 5245.

Call flow and firewall planning

Call flow and firewall planning depends on whether the user has direct access to the public IP address of the SBC, and whether the user is inside or outside of the network.

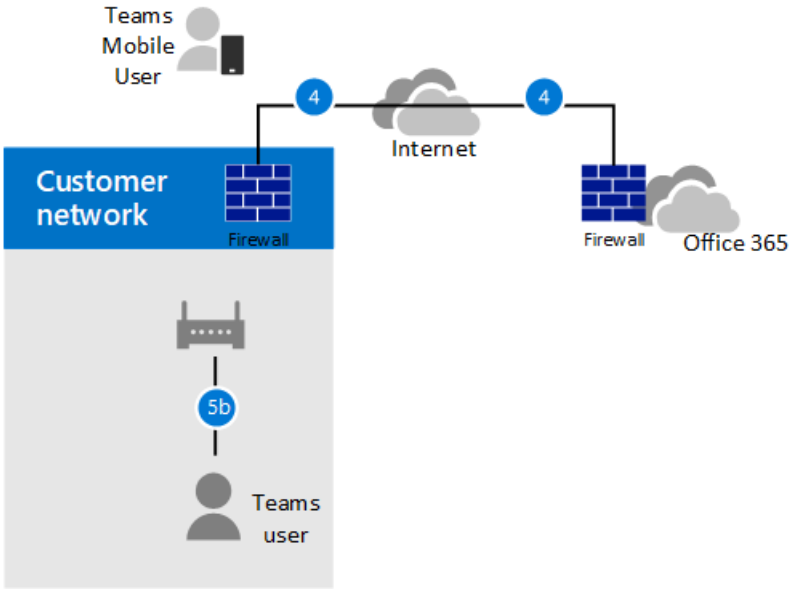
Call flow if the user has direct access to the public IP address of the SBC

If the user has direct access to the public IP address of the SBC, the call flow is as follows:

- For media bypass, the Teams client must have access to the public IP address of the SBC even from an internal network. If direct media is not desired, the media can flow via Transport Relays.
- This is the recommended solution when a user is in the same building and/or network as the SBC – remove Microsoft Cloud components from the media path.
- Signaling always flows via the Microsoft cloud.

The following diagram shows call flow when media bypass is enabled, the client is internal, and the client can reach the public IP address of the SBC (direct media):

- The arrows and numeric values of the paths are in accordance with Microsoft Teams call flows.
- The SIP signaling always takes paths 4 and 4' (depending on the direction of the traffic). Media stays local and takes path 5b.



Call flow if the user does not have access to the public IP address of the SBC

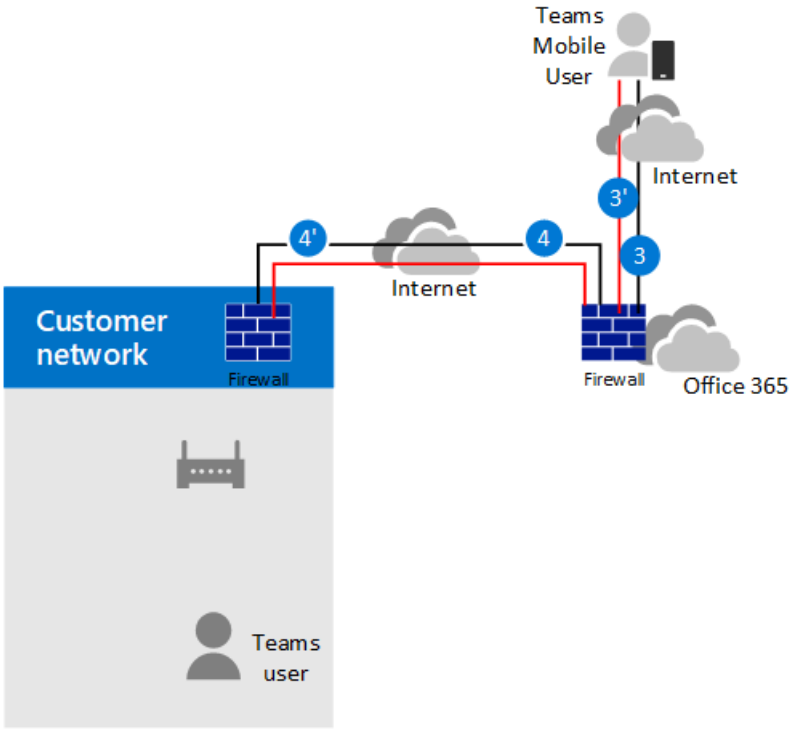
The following describes call flow if the user does not have access to the public IP address of the SBC.

For example, assume the user is external, and the tenant administrator decided not to open the public IP address of the SBC to everyone in the Internet, but only to the Microsoft Cloud. The internal components of traffic can flow via the Teams Transport Relays. Consider the following:

- Teams Transport Relays are used.
- For media bypass, Microsoft uses a version of Transport Relays that requires opening ports 50 000 to 59 999 between the Teams Transport Relays and the SBC (in the future we plan to move to the version which requires only 3478 and 3479 ports).

The following diagram shows call flow when media bypass is enabled, the client is external, and the client cannot reach the public IP address of the Session Border Controller (media is relayed by Teams Transport Relay).

- The arrows and numeric values of the paths are in accordance with Microsoft Teams call flows.
- Media is relayed via paths 3, 3', 4 and 4'

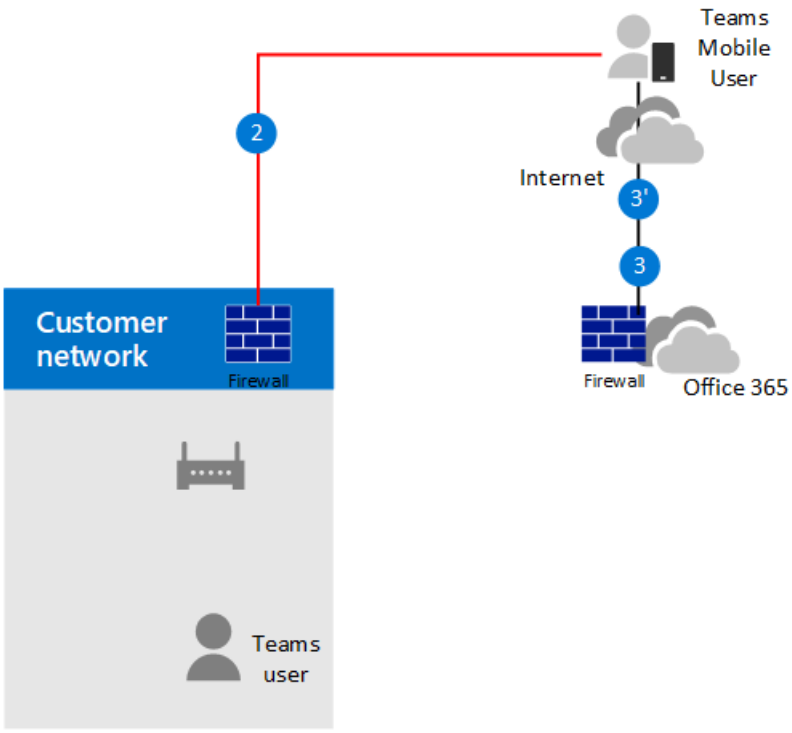


Call flow if a user is outside the network and has access to the public IP of the SBC

> **NOTE**
> This is not a recommended configuration because it does not take advantage of Teams Transport Relays. Instead, you should consider the previous scenario where the user does not have access to the public IP address of the SBC.

The following diagram shows call flow when media bypass is enabled, the client is external, and the client can reach the public IP address of the SBC (direct media).

- The arrows and numeric values of the paths are in accordance with the Microsoft Teams call flows article.
- The SIP signaling always takes paths 3 and 3' (depending on the direction of the traffic). Media flows using path 2.



Use of Media Processors and Transport Relays

There are two components in the Microsoft Cloud that can be in the path of media traffic: Media Processors and Transport Relays.

- The Media Processor is a public facing component that handles media in non-bypass cases and handles media for voice applications.

  Media Processors are always in the path for end user non-bypassed calls, but never in the path for bypassed calls. Media Processors are always in the path for all voice applications such as Call Park, Organizational Auto Attendant, and Call Queues.

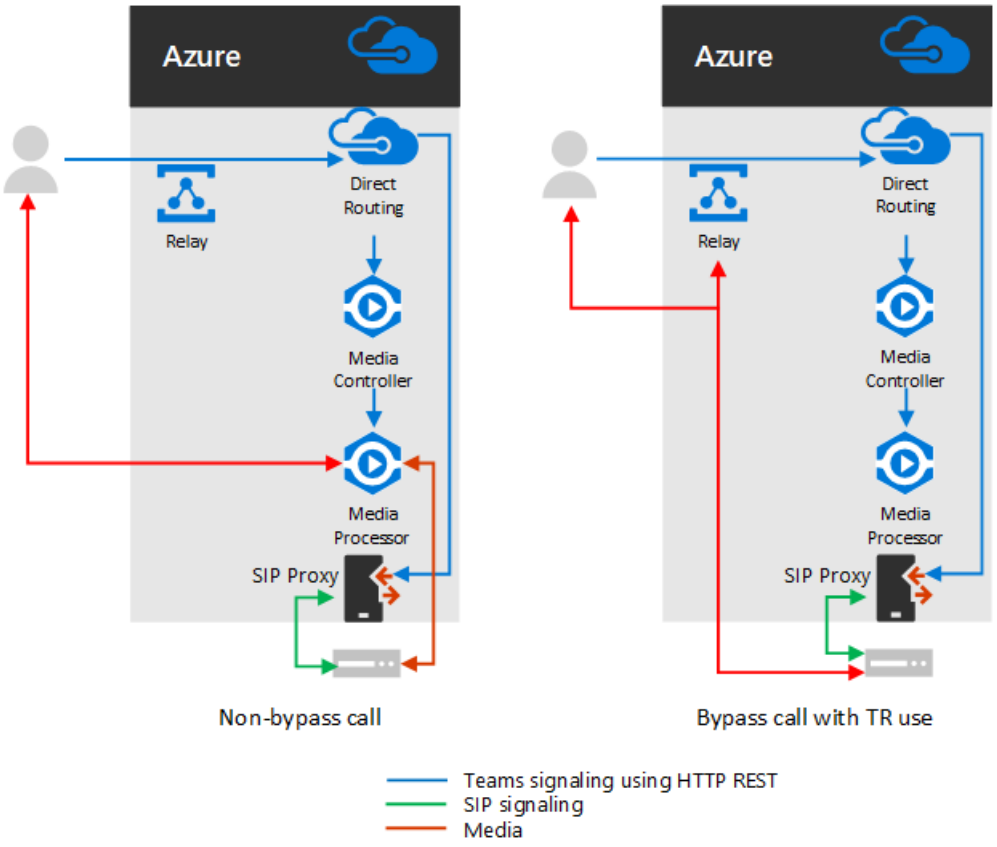
- The Transport Relay is used to connect to the closest Transport Service to send real time traffic.

  Transport Relays might or might not be in the path for bypassed calls--originating from or destined to end users--depending on where the user is and how the network is configured .

The following diagram shows two call flows – one with media bypass enabled and the second with media bypass disabled. Note the diagram only illustrates traffic originating from--or destined to--end users.

- The Media Controller is a microservice in Azure that assigns Media Processors and creates Session Description Protocol (SDP) offers.

- The SIP Proxy is a component that translates HTTP REST signaling used in Teams to SIP.



The table below summarizes the difference between Media Processors and Transport Relays.

	MEDIA PROCESSORS	TRANSPORT RELAYS
In media path for non-bypassed calls for end users	Always	Never
In media path for bypassed calls for end users	Never	If client cannot reach the SBC on the public IP address
In media path for voice applications	Always	Never
Can do transcoding (B2BUA)*	Yes	No, only relays audio between endpoints
Number of instances worldwide and location	10 total: 2 in US East and West; 2 in Amsterdam and Dublin; 2 in Hong Kong and Singapore; 2 in Japan ; 2 in Australia East and Southeast	Multiple

The IP ranges are:

- 52.112.0.0/14 (IP addresses from 52.112.0.1 to 52.115.255.254)
- 52.120.0.0/14 (IP addresses from 52.120.0.1 to 52.123.255.254)

* Transcoding explanation:

- Media Processor is B2BUA, which means it can change a codecs (for example, SILK from Teams client to MP and G.711 between MP and SBC).
- Transport Relays are not B2BUA, which means the codec is never changed between the client and the SBC--

even if traffic flows via relays.

Use of Teams Media Processors if trunk is configured for media bypass

Teams Media Processors are always inserted in the media path in the following scenarios:

- Call is escalated from 1:1 to a group call
- Call is going to a federated Teams user
- Call is forwarded or transferred to a Skype for Business user

Ensure your SBC has access to the Media Processors and Transport Relays ranges as described below.

SIP Signaling: FQDNs

For SIP signaling, the FQDN and firewall requirements are the same as for non-bypassed cases.

Direct Routing is offered in the following Microsoft 365 or Office 365 environments:

- Microsoft 365 or Office 365
- Office 365 GCC
- Office 365 GCC High
- Office 365 DoD Learn more about Office 365 and US Government environments such as GCC, GCC High, and DoD.

Microsoft 365, Office 365, and Office 365 GCC environments

The connection points for Direct Routing are the following three FQDNs:

- **sip.pstnhub.microsoft.com** – Global FQDN – must be tried first. When the SBC sends a request to resolve this name, the Microsoft Azure DNS servers return an IP address pointing to the primary Azure datacenter assigned to the SBC. The assignment is based on performance metrics of the datacenters and geographical proximity to the SBC. The IP address returned corresponds to the primary FQDN.
- **sip2.pstnhub.microsoft.com** – Secondary FQDN – geographically maps to the second priority region.
- **sip3.pstnhub.microsoft.com** – Tertiary FQDN – geographically maps to the third priority region.

You must place these three FQDNs in order to:

- Provide optimal experience (less loaded and closest to the SBC datacenter assigned by querying the first FQDN).
- Provide failover when a connection from an SBC is established to a datacenter that is experiencing a temporary issue. For more information, see Failover mechanism below.

The FQDNs **sip.pstnhub.microsoft.com**, **sip2.pstnhub.microsoft.com**, and **sip3.pstnhub.microsoft.com** will be resolved to one of the following IP addresses:

- 52.114.148.0
- 52.114.132.46
- 52.114.16.74
- 52.114.20.29
- 52.114.75.24
- 52.114.76.76
- 52.114.7.24
- 52.114.14.70

You need to open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signaling. If your firewall supports DNS names, the FQDN **sip-**

all.pstnhub.microsoft.com resolves to all these IP addresses.

Office 365 GCC DoD environment

The connection point for Direct Routing is the following FQDN:

sip.pstnhub.dod.teams.microsoft.us – Global FQDN. As the Office 365 DoD environment exists only in the US data centers, there is no secondary and tertiary FQDNs.

The FQDNs – sip.pstnhub.dod.teams.microsoft.us will be resolved to one of the following IP addresses:

- 52.127.64.33
- 52.127.68.34

You need to open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signaling. If your firewall supports DNS names, the FQDN sip.pstnhub.dod.teams.microsoft.us resolves to all these IP addresses.

Office 365 GCC High environment

The connection point for Direct Routing is the following FQDN:

sip.pstnhub.gov.teams.microsoft.us – Global FQDN. As the GCC High environment exists only in the US data centers, there is no secondary and tertiary FQDNs.

The FQDNs – sip.pstnhub.gov.teams.microsoft.us will be resolved to one of the following IP addresses:

- 52.127.88.59
- 52.127.92.64

You need to open ports for all these IP addresses in your firewall to allow incoming and outgoing traffic to and from the addresses for signaling. If your firewall supports DNS names, the FQDN sip.pstnhub.gov.teams.microsoft.us resolves to all these IP addresses.

SIP Signaling: Ports

Port requirements are the same for all Office 365 environments where Direct Routing is offered:

- Microsoft 365 or Office 365
- Office 365 GCC
- Office 365 GCC High
- Office 365 DoD

You must use the following ports:

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT
SIP/TLS	SIP Proxy	SBC	1024 - 65535	Defined on the SBC
SIP/TLS	SBC	SIP Proxy	Defined on the SBC	5061

Media traffic: IP and Port ranges

Media traffic flows between the SBC and Teams client if direct connectivity is available or via Teams Transport Relays if the client cannot reach the SBC using the public IP address.

Requirements for direct media traffic (between the Teams client and the SBC)

The client must have access to the specified ports (see table) on the public IP address of the SBC.

Note: If the client is in an internal network, the media flows to the public IP address of the SBC. You can configure hair pinning on your NAT device so traffic never leaves the enterprise network equipment.

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT
UDP/SRTP	Client	SBC	50 000 – 50 019	Defined on the SBC
UDP/SRTP	SBC	Client	Defined on the SBC	50 000 – 50 019

> **NOTE**
> If you have a network device that translates the client's source ports, please make sure that translated ports are opened between the network equipment and the SBC.

Requirements for using Transport Relays

Transport Relays are in the same range as Media Processors (for non-bypass cases):

Microsoft 365, Office 365, and Office 365 GCC environments

- 52.112.0.0 /14 (IP addresses from 52.112.0.1 to 52.115.255.254)

Office 365 GCC DoD environment

- 52.127.64.0/21

Office 365 GCC High environment

- 52.127.88.0/21

The port range of the Teams Transport Relays (applicable to all environments) is shown in the following table:

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT
UDP/SRTP	Transport Relay	SBC	50 000 -59 999	Defined on the SBC
UDP/SRTP	SBC	Transport Relay	Defined on the SBC	50 000 – 59 999, 3478, 3479

> **NOTE**
> Microsoft recommends at least two ports per concurrent call on the SBC. Because Microsoft has two versions of Transport Relays, the following are required:
>
> - v4, which can only work with port range 50 000 to 59 999
> - v6, which works with ports 3478, 3479

At this time, media bypass only supports v4 version of Transport Relays. We will introduce support of v6 in the future.

You need to open ports 3478 and 3479 for transitioning. When Microsoft introduces support for v6 Transport Relays with Media Bypass, you will not need to reconfigure your network equipment or SBCs.

Requirements for using media processors

Media Processors are always in the media path for voice applications and for Web clients (for example, Teams clients in Edge or Google Chrome). The requirements are the same as for non-bypass configuration.

The IP range for media traffic is

Office 365 and Office 365 GCC environments

- 52.112.0.0 /14 (IP addresses from 52.112.0.1 to 52.115.255.254)

Office 365 GCC DoD environment

- 52.127.64.0/21

Office 365 GCC High environment

- 52.127.88.0/21

The port range of the Media Processors (applicable to all environments) is shown in the following table:

TRAFFIC	FROM	TO	SOURCE PORT	DESTINATION PORT
UDP/SRTP	Media Processor	SBC	3478, 3479 and 49 152 – 53 247	Defined on the SBC
UDP/SRTP	SBC	Media Processor	Defined on the SBC	3478, 3479 and 49 152 – 53 247

Configure separate trunks for media bypass and non-media bypass

If you are migrating to media bypass from non-media bypass and want to confirm functionality before migrating all usage to media bypass, you can create a separate trunk and separate Online Voice Routing policy to route to the media bypass trunk and assign to specific users.

High-level configuration steps:

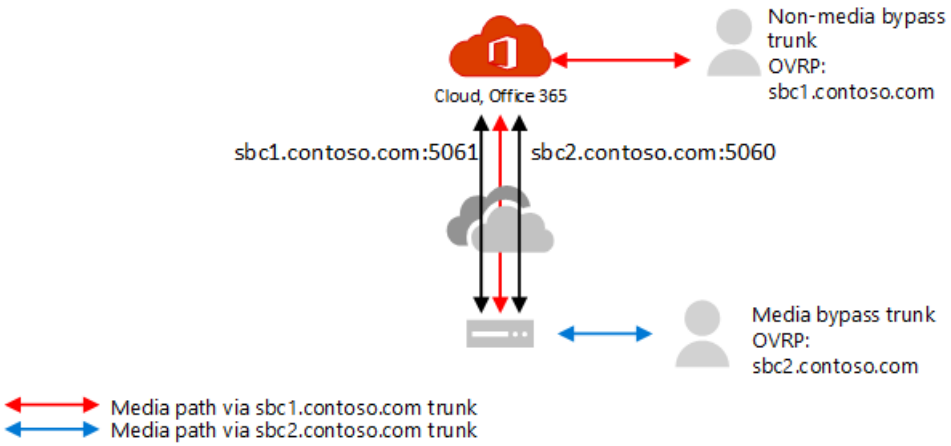
- Identify users to test media bypass.
- Create two separate trunks with different FQDNs: one enabled for media bypass; the other not.

  Both trunks point to the same SBC. The ports for TLS SIP signaling must be different. The ports for media must be the same.
- Create a new Online Voice Routing policy and assign the media bypass trunk to the corresponding routes associated with the PSTN usage for this policy.
- Assign the new Online Voice Routing policy to users you have identified to test media bypass.

The example below illustrates this logic.

SET OF USERS	NUMBER OF USERS	TRUNK FQDN ASSIGNED IN OVRP	MEDIA BYPASS ENABLED
Users with non-media bypass trunk	980	sbc1.contoso.com:5060	true
Users with media bypass trunk	20	sbc2.contoso.com:5061	false

Both trunks can point to the same SBC with the same public IP address. The TLS signaling ports on the SBC must be different, as shown in the following diagram. Note you will need to make sure that your certificate supports both trunks. In SAN, you need to have two names (**sbc1.contoso.com** and **sbc2.contoso.com**) or have a wildcard certificate.



For information about how to configure two trunks on the same SBC, see the documentation provided by your SBC vendor:

- AudioCodes deployment documentation
- Oracle deployment documentation
- Ribbon Communications deployment documentation
- TE-Systems (anynode) deployment documentation

Client endpoints supported with media bypass

Media bypass is supported with all standalone Teams Desktop clients, Android and iOS clients and Teams Phone Devices.

For all other endpoints that do not support media bypass, we will convert the call to non-bypass even if it started as a bypass call. This happens automatically and does not require any actions from the administrator. This includes Skype for Business 3PIP Phones, and Teams Web Clients that support Direct Routing calling (WebRTC based clients running on Microsoft Edge, Google Chrome, Mozilla Firefox).

See also

Configure media bypass with Direct Routing

Configure media bypass with Direct Routing

5/29/2020 • 2 minutes to read • Edit Online

Before configuring media bypass with Direct Routing, be sure you have read Plan for media bypass with Direct Routing.

To turn on media bypass, the following conditions must be met:

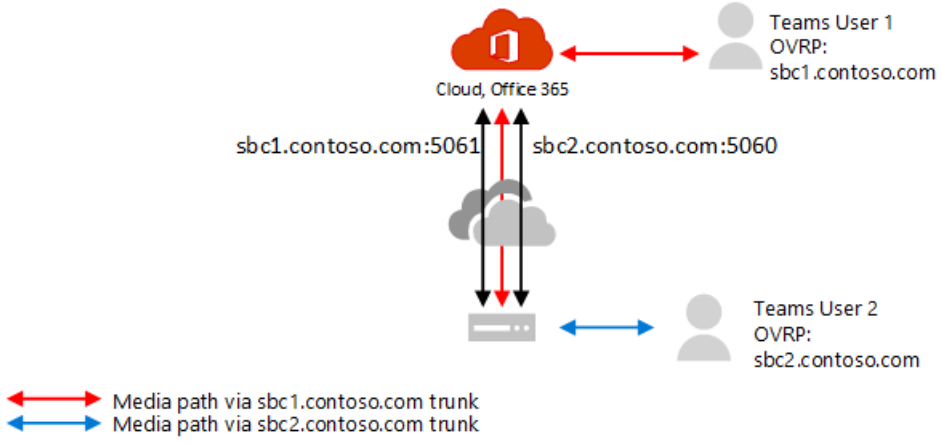
1. Make sure that your Session Border Controller (SBC) vendor of choice supports media bypass and provides instructions on how to configure bypass on the SBC. Please refer to the certification page to learn about SBCs, which ones support media bypass, and for instructions.
2. You need to turn on media bypass on the trunk using the following command: **Set-CSOnlinePSTNGateway -Identity <sbc_FQDN> -MediaBypass $true**.
3. Make sure that the required ports are opened.

Migrate from non-bypassed trunks to bypass-enabled trunks

You can switch all users at once or you can implement a phased approached (recommended).

- **Switch all users at once.** If all conditions are met, you can turn bypass mode on. However, all your production users will be switched at the same time. Because you might experience some issues initially when you configure trunks and ports, your production user experience might be affected.
- **Phased approach. (Recommended)**. Create a new trunk for the same SBC (with a different port), test it, and change the online voice routing policy for the users to point to the new trunk.

  This is the recommended approach because it allows for a smoother transition and uninterrupted user experience. This approach requires configuration of the SBC, a new FQDN name, and configuration of the firewall. Note you will need to make sure that your certificate supports both trunks. In SAN, you need to have two names (**sbc1.contoso.com** and **sbc2.contoso.com**) or have a wildcard certificate.



For instructions on how to configure the trunks and perform migration, see the documentation from your SBC vendor:

- AudioCodes deployment documentation
- Oracle deployment documentation
- Ribbon Communications deployment documentation
- TE-Systems (anynode) deployment documentation

For a list of Session Border Controllers (SBCs) certified for Direct Routing, see List of Session Broder Controllers certified for Direct Routing.

Related topics

Plan media bypass with Direct Routing

Local Media Optimization for Direct Routing

12/5/2020 • 17 minutes to read • Edit Online

Public Switched Telephone Network (PSTN) voice is considered a business-critical application with high expectations for voice quality. Direct Routing lets you control media traffic flows to accommodate a multitude of network topologies and local telephony setups for various enterprises all over the world.

Local Media Optimization for Direct Routing lets you manage voice quality by:

- Controlling how media traffic flows between the Teams clients and the customer Session Border Controllers (SBCs).
- Keeping media local within the boundaries of corporate network subnets.
- Allowing media streams between the Teams clients and the SBCs even if the SBCs are behind corporate firewalls with private IPs and not visible to Microsoft directly.

Local Media Optimization supports two scenarios:

- Centralization of all local trunks through a centralized SBC connected to the main Session Initiation Protocol (SIP)trunk--providing telephony services to all local branch offices of the company.
- Building a virtual network topology of SBCs--where the SBCs in the local branch offices are connected to a centralized proxy SBC that is visible to, and communicating with, Microsoft Phone System through its external IP address. In a virtual network topology, downstream SBCs are communicating through internal IPs and are not directly visible to Phone System.

This article describes feature functionality, and customer scenarios and solutions. For details on configuration, see Configure Local Media Optimization.

> **NOTE**
> If you want to keep media local within the boundaries of your intranet, Local Media Optimization is recommended. If you already have Media Bypass and you use only the public IP addresses of your SBCs, it is not mandatory to move to Local Media Optimization. You can continue to use Media Bypass. For more information, see Plan Media Bypass.

Supported customer scenarios

For this discussion, assume that Contoso runs multiple businesses across the globe as follows. (Note that Europe and APAC regions are used as examples only. A company might have several different regions with similar requirements.)

- **In Europe**, Contoso has offices in approximately 30 countries. Each office has its own Private Branch Exchange (PBX).

  Contoso was offered an option to centralize the trunks in one location--Amsterdam--for all 30 European offices. Contoso deployed the SBC in Amsterdam, provided enough bandwidth to run calls through the centralized location, connected a central SIP trunk to the centralized location, and started serving all European locations from Amsterdam.

- **In the APAC region**, Contoso has multiple offices in different countries.

  In many countries, the company still has time-division multiplexing (TDM) trunks in local branch offices. Centralization of the TDM trunks is not an option in the APAC region, so switching to SIP is not possible.

Assume there are more than fifty Contoso branch offices across the APAC region with hundreds of gateways (SBCs). In this scenario, it is not possible to pair all gateways to the Direct Routing interface because of a lack of public IP addresses and/or local internet breakouts. In addition, some countries impose regulatory requirements that cannot be fulfilled without having local PSTN network connectivity.

Based on their business requirements, Contoso implemented two solutions with Local Media Optimization for Direct Routing:

- **In Europe**, all trunks are centralized and media flows between the central SBC and the users, based on the user location.
  - If a user is connected to the local subnet of a corporate network (that is, the user is internal), media flows between the internal IP of the central SBC and the user's Teams client.
  - If a user is outside the boundaries of the corporate network--for example, if the user is using a public wireless Internet connection--then the user is considered to be external. In this case, the media flows between the external IP of the central SBC and the Teams client.
- **In the APAC region**, a centralized proxy SBC is paired to Microsoft Direct Routing, which directs media between the Direct Routing interface and the downstream SBCs in local branch offices.

  The downstream SBCs in the local branch offices are not directly visible to Direct Routing in APAC, but they are paired by using the Set-CSOnlinePSTNGateway cmdlet to create a virtual network topology within Microsoft Phone System. Media always stays local when possible. External users have media flowing between the Teams client and the public IP of the proxy SBC.

Central SBC with centralized trunks

To build a solution where PSTN services are provided to all local branch offices through a single central SBC with a connected centralized SIP trunk, the Contoso tenant administrator pairs one SBC (centralsbc.contoso.com) to the service; the SBC has a centralized SIP trunk connected to it.

- When a user is in the internal network of the company, the SBC provides the internal IP of the SBC for media.
- When a user is outside of the corporate network, the SBC provides the external (public) IP of the SBC.

Note: All values within examples, tables, or diagrams are presented for illustration purposes only.

Table 1. Example network parameters for SBCs

LOCATION	SBC FQDN	INTERNAL SUBNET	EXTERNAL NAT (TRUSTED IP)	SBC EXTERNAL IP ADDRESS	SBC INTERNAL IP ADDRESS			
Amsterdam	centralsbc.contoso.com	192.168.5.0/24	172.16.76.73	172.16.76.71	192.168.5.5			
Germany	Not deployed	192.168.6.0/24	172.16.76.74	Not deployed	Not deployed			
France	Not deployed	192.168.7.0/24	172.16.76.75	Not deployed	Not deployed			

Internal user

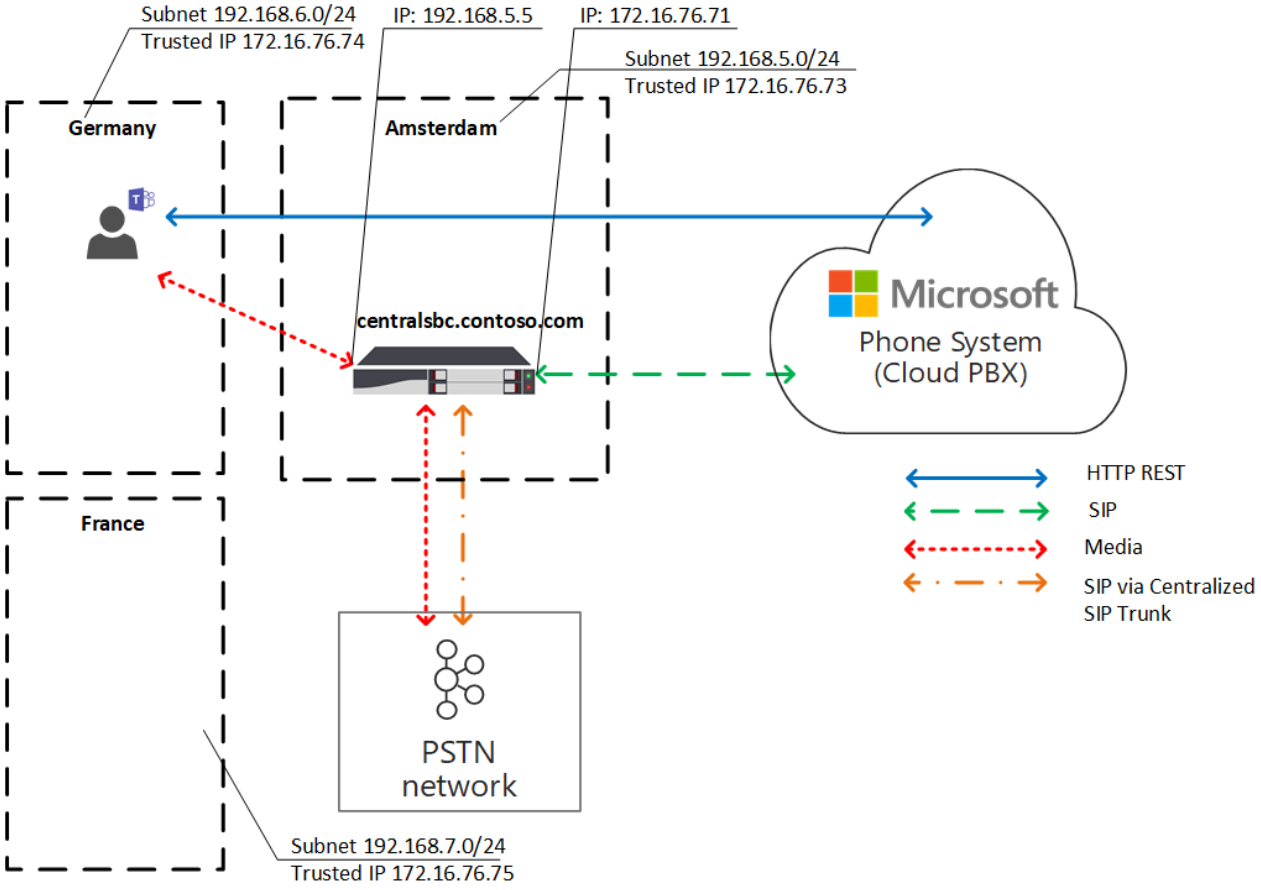
The following diagram shows the traffic flow when a user is connected to the corporate network in the user's

home branch office or site.

While on premises, the user is assigned to the local branch office in Germany. The user makes a Direct Routing phone call through Teams.

- The user's Teams client communicates to Phone System directly through the REST API, but the media generated during the call flows to the central SBC's internal IP address.
- The SBC redirects the flow to Phone System and the connected PSTN network.
- The central SBC is visible to Phone System through the external IP address only.

Diagram 1. Traffic flow when the user is in the 'home' site with a centralized SBC and with a connected centralized SIP Trunk



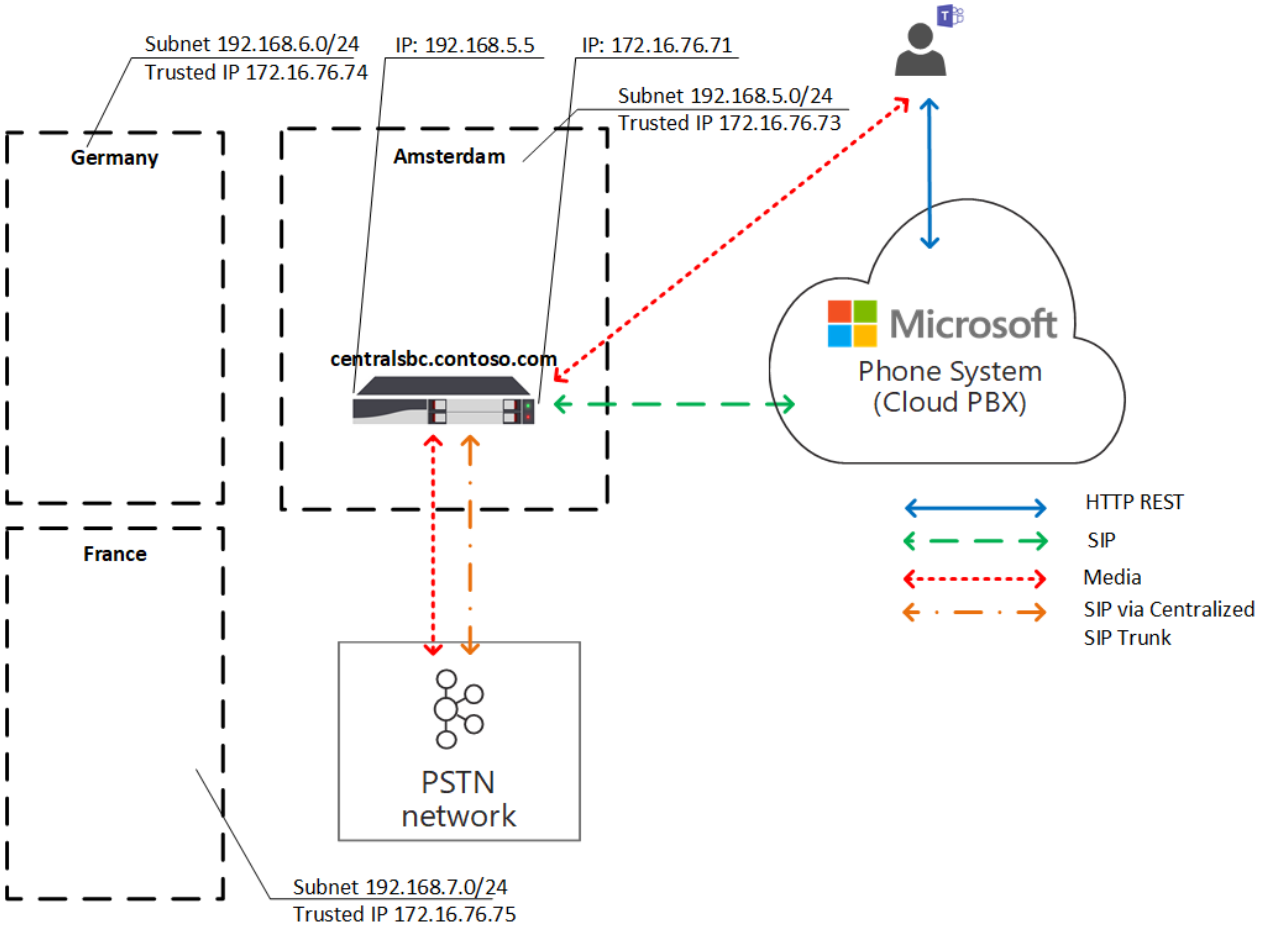
External user

The following diagram shows the traffic flow when a user is not on premises and is not connected to the corporate network (that is, the user's device is connected to the Internet through a mobile device or public Wi-Fi). The user makes a Direct Routing phone call through Teams:

- The user's Teams client communicates to Phone System directly through the REST API, but, in this case, the media generated during the call flows to the central SBC's external IP address.
- The SBC redirects the flow to Phone System and the connected PSTN network.
- The central SBC is visible to Phone System through the external IP address only.

In this case, the behavior is similar whether the user is local to the branch office in Germany or to any other branch office. The user is considered external because the user is outside the boundaries of the corporate network.

Diagram 2. Traffic flow when the user is external with a centralized SBC and with a connected centralized SIP Trunk



Proxy SBC with connected downstream SBCs

To build a solution where PSTN services are provided in all local branch offices in the APAC region where centralization of the TDM trunks is not an option, the Contoso administrator pairs one SBC (proxysbc.contoso.com), also called the proxy SBC, to the Direct Routing service.

Afterwards, the Contoso administrator adds some downstream SBCs indicating that they can be reached through the proxy SBC proxysbc.contoso.com. Downstream SBCs do not have public IPs, however, they can be assigned to voice routes. The table below shows example network parameters and configuration.

When a user is in the local branch office where the downstream SBC is located, the media traffic flows between the user and the local downstream SBC directly. If a user is outside of the office (on a public internet), the media flows from the user to the public IP of the Proxy SBC, which proxies it to the relevant downstream SBC(s).

Table 2. Example SBC network information

LOCATION	SBC FQDN	INTERNAL SUBNET	EXTERNAL NAT (TRUSTED IP)	SBC EXTERNAL IP ADDRESS	SBC INTERNAL IP ADDRESS
Vietnam	VNsbc.contoso.com	192.168.1.0/24	172.16.240.110	None	192.168.1.5
Indonesia	IDsbc.contoso.com	192.168.2.0/24	172.16.240.120	None	192.168.2.5
Singapore	proxysbc.contoso.com	192.168.3.0/24	172.16.240.130	172.16.240.133	192.168.3.5

Internal user

The following diagram shows the high-level traffic flow for the scenario when a user is inside the office in the

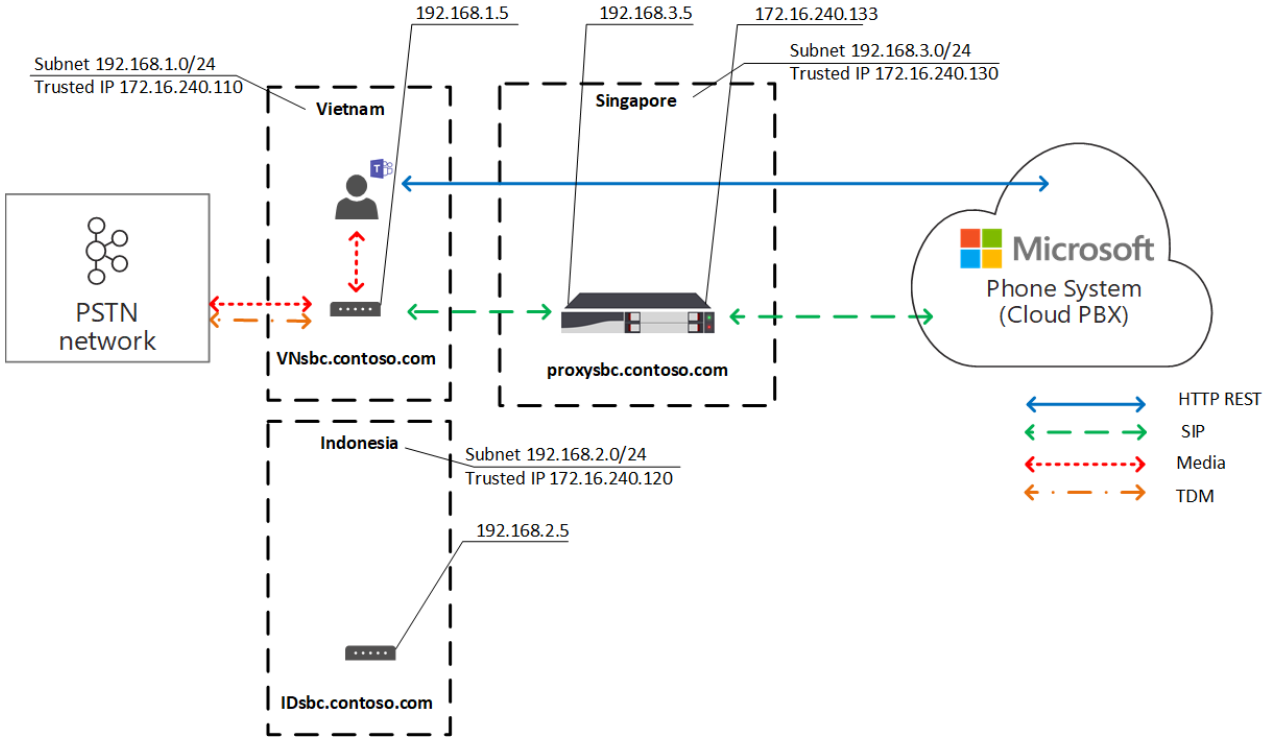
APAC region. The user, who is assigned to a local branch office in Vietnam, and is on premises, makes a Direct Routing phone call through Teams.

- The user's Teams client communicates with Phone System directly through the REST API, but media generated during the call flows to local SBC's internal IP address.
- The local SBC redirects the flow to the proxy SBC in Singapore and to the connected local PSTN network.
- The proxy SBC is visible to Phone System through the external IP address only and routes the flow from the downstream SBC (in this case the local SBC in Vietnam) to Phone System.
- The downstream SBC in the local branch office is not visible to Phone System directly but is mapped within the virtual network topology that is defined by the Contoso administrator while setting up Local Media Optimization.

Note: The behavior might be different for local users and non-local users depending on the configured Local Media Optimization mode.

For more information on possible modes and relevant behavior, see Configure Local Media Optimization.

Diagram 3. Traffic flow when the user is in the "home" network with a proxy SBC and with connected downstream SBCs



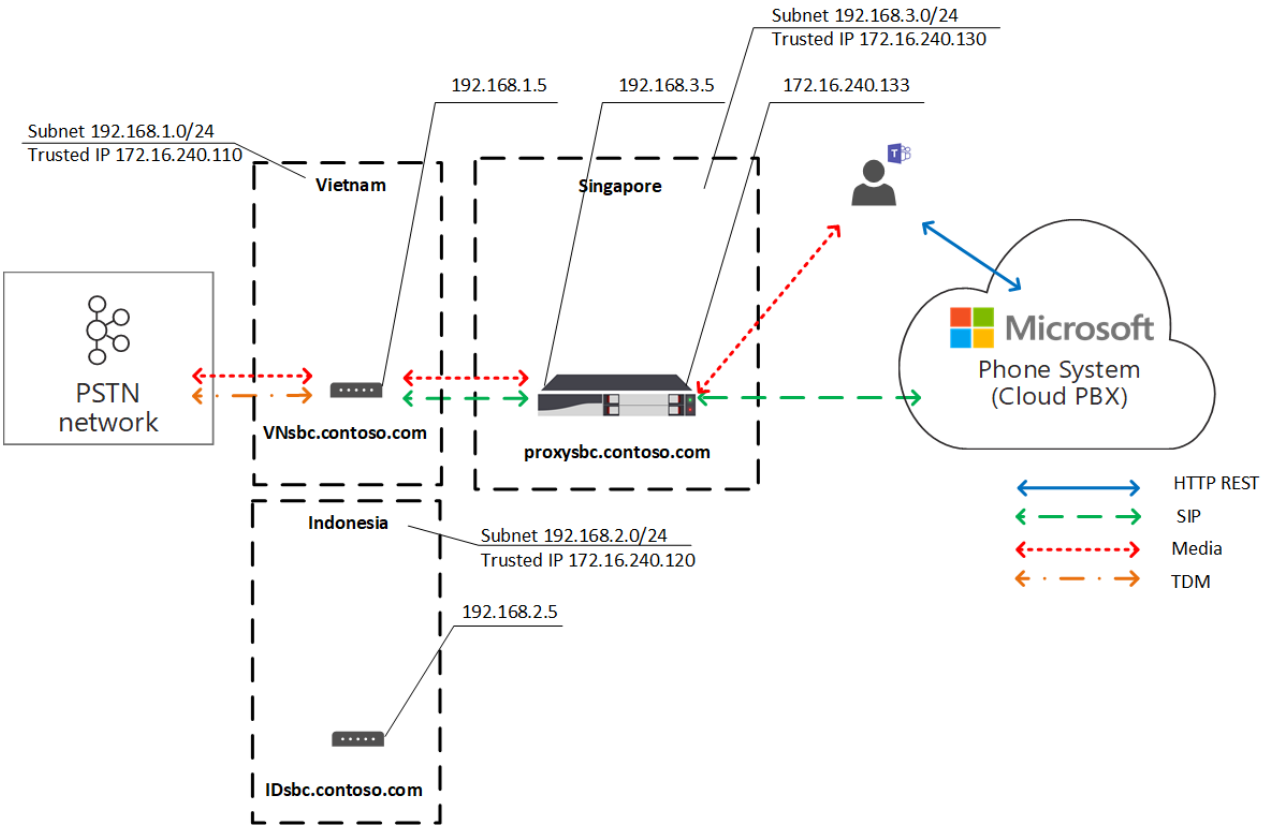
External user

The following diagram shows the traffic flow when a user is outside of the corporate network boundaries. The user is not on premises (is not within the boundaries of corporate network). The user makes a Direct Routing phone call through Teams to a phone number in Vietnam.

- The user's Teams client communicates with Phone System directly through the REST API, but the media generated during the call flows first to the external IP address of the proxy SBC in Singapore.
- Based on configuration and voice policies (see Configure Local Media Optimization for details), the proxy SBC redirects the flow to the downstream SBC in Vietnam.
- The downstream SBC in Vietnam redirects the flow to the connected local PSTN network.
- The proxy SBC is visible to Phone System through the external IP address only.

- The downstream SBC in the local branch office is not visible to Phone System directly, but is mapped within the virtual network topology that is defined by the Contoso administrator while setting up Local Media Optimization. In the example, the user is considered external because the user is outside the boundaries of the corporate network.

Diagram 4. Traffic flow when the user is external with a proxy SBC and with connected downstream SBCs



Local Media Optimization modes

Local Media Optimization supports two modes:

- **Mode 1: Always bypass**. In this case, if the user is internal, the media will flow through the local downstream SBC's internal IP address regardless of the actual location of the internal user; for example, within the same branch office where the downstream SBC is located or in some other branch office.
- **Mode 2: Only for local users**. In this mode, media will flow directly to the local downstream SBC's internal IP address only when generated by the internal user located in the same branch office as the downstream SBC.

To distinguish between Local Media Optimization modes, the tenant administrator needs to set the -BypassMode parameter to either 'Always' or 'OnlyForLocalUsers' for every SBC by using the Set-CSonlinePSTNGateway cmdlet. For more information, see Configure Local Media Optimization.

Mode 1: Always bypass

If you have good connection between branch offices, the recommended mode is Always bypass.

For example, assume a company has a centralized SIP trunk in Amsterdam, which serves 30 countries and has good connectivity between all 30 sites and local users. There is also a branch in Germany where a local SBC is deployed.

The SBC in Germany can be configured in "Always bypass" mode. Users, regardless of their location, will connect to the SBC directly through the internal IP address of the SBC (for example from France to Germany; see the diagram below for reference).

The following describes two scenarios:

- Scenario 1. The user is in the same location as the SBC defined in the Online Voice Routing Policy.
- Scenario 2. The user and gateways are in different sites.

Scenario 1. The user is in the same location as the SBC defined in the Online Voice Routing Policy

The SBC in Amsterdam is configured to be a proxy SBC for a local downstream SBC in Germany. The user is in Germany within the same subnet as the corporate network of the local SBC. Both SBCs (proxy and downstream) are configured for Always Bypass mode. Online voice routing policies specify that in case of calls within Germany (with area code +49) they should be routed to the local SBC in Germany. All other calls--and in case the SBC in Germany fails, calls in Germany--should be routed to the proxy SBC in Amsterdam. The following table summarizes the example configuration.

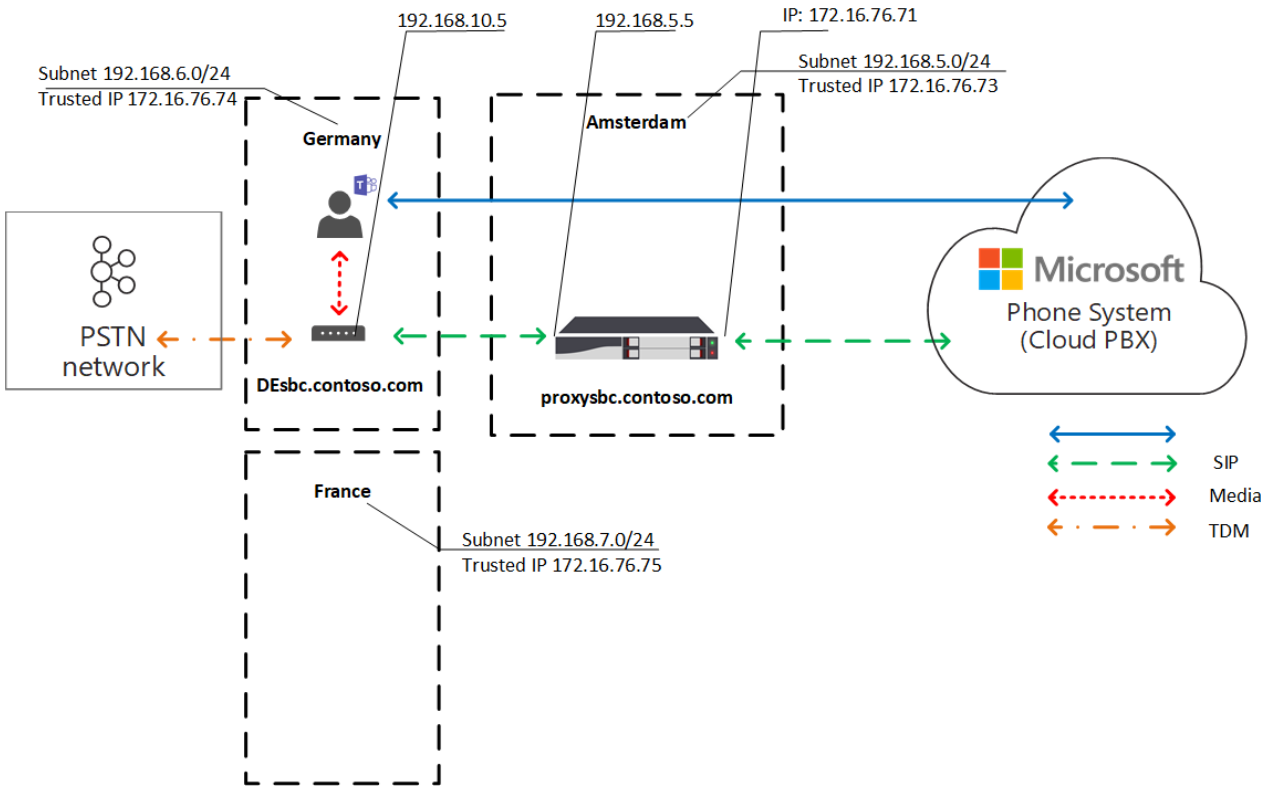
Table 3. Example configuration for Scenario 1

USER PHYSICAL LOCATION	USER MAKES A CALL TO A NUMBER	ONLINE VOICE ROUTING POLICY	MODE CONFIGURED FOR SBC	MEDIA FLOW
Germany	+49 1 437 2800	Priority 1: ^+49(\d{8})$ - DEsbc.contoso.com Priority 2: .* - proxysbc.contoso.com	DEsbc.contoso.com – Always Bypass proxysbc.contoso.com – Always Bypass	Teams User <–> DEsbc.contoso.com

The diagram below shows the high-level traffic flow for the internal user in Germany making a Direct Routing phone call through Teams to the number in Germany.

- The user's Teams client communicates with Phone System directly through the REST API.
- The media generated during the call flows to the local SBC's internal IP address.
- The local SBC redirects the flow to the proxy SBC in Amsterdam and to the connected local PSTN network.
- The proxy SBC is visible to Phone System through the external IP address only and routes the flow from the downstream SBC (in this case, the local SBC in Germany) to Phone System.
- The downstream SBC in the local branch office is not visible to Phone System directly but is mapped within the virtual network topology that is defined by the Contoso administrator while setting up Local Media Optimization.

Diagram 5. Traffic flow with "Always Bypass" mode and the user is in the "home" site



Scenario 2: The user and gateways are in different sites

The SBC in Amsterdam is configured to be a proxy SBC for a local downstream SBC in Germany. Both SBCs (proxy and downstream) are configured for Always Bypass mode. The internal user in France, located in the local branch office, is making a Direct Routing call to Germany. Online voice routing policies specify that calls to Germany (with area code +49) should be routed to the local SBC in Germany. All other calls--and, in case the SBC in Germany fails, all calls in Germany--should be routed to the proxy SBC in Amsterdam. The following table summarizes the example configuration.

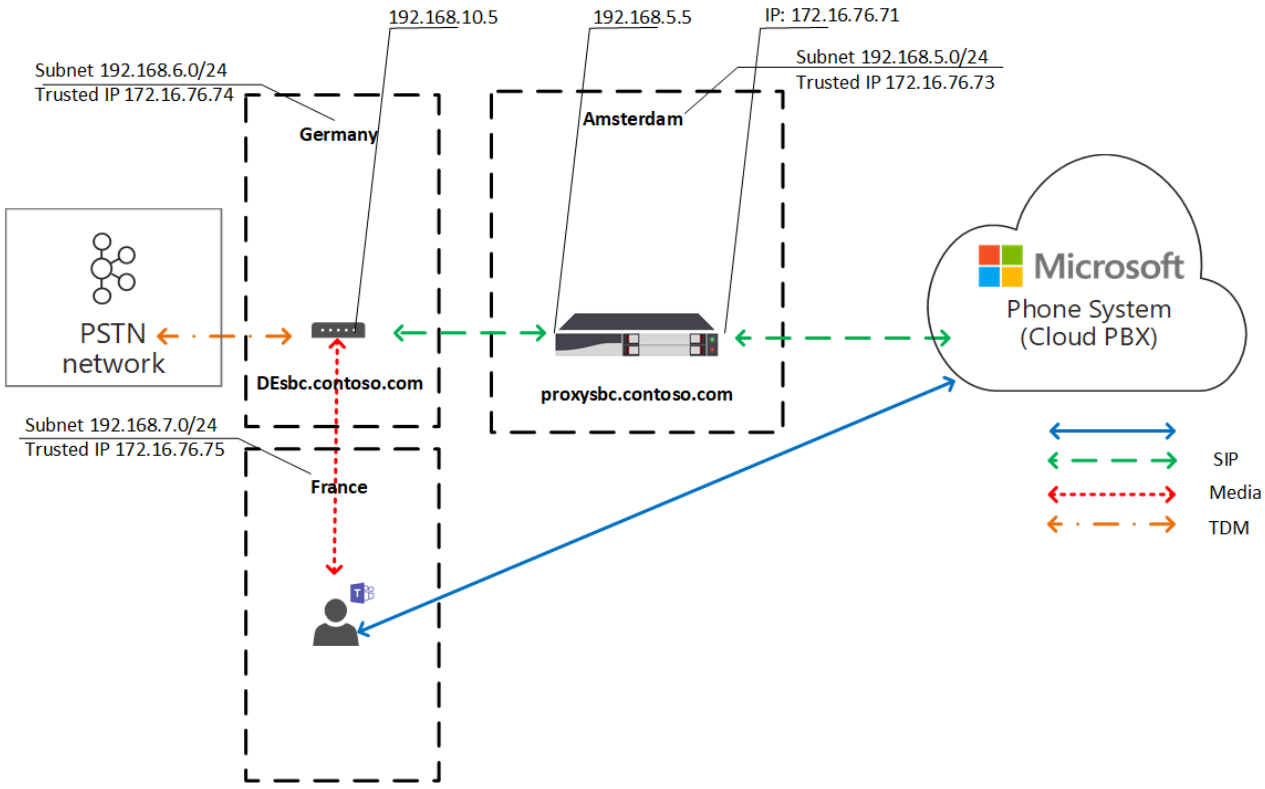
Table 4. Example configuration for Scenario 2

USER PHYSICAL LOCATION	USER MAKES A CALL TO A NUMBER	ONLINE VOICE ROUTING POLICY	MODE CONFIGURED FOR SBC	MEDIA FLOW
France	+49 1 437 2800	Priority 1: ^+49(\d{8})$ - DEsbc.contoso.com Priority 2: .* - proxysbc.contoso.com	DEsbc.contoso.com – Always Bypass proxysbc.contoso.com – Always Bypass	Teams User <– > DEsbc.contoso.com

The following diagram shows the high-level traffic flow when the internal German user located in France makes a Direct Routing phone call through Teams to the number in Germany.

- The user's Teams client communicates with Phone System directly through the REST API.
- The media generated during the call flows directly to the SBC in Germany's internal IP address.
- The SBC in Germany redirects the flow to the proxy SBC in Amsterdam and to the connected local PSTN network.

Diagram 6. Traffic flow with "Always Bypass" mode and the user is not in "home" site but in the internal network



Mode 2: Only for local users

If there are bad connections between local branch offices but good connections between each local branch office and regional office, then the recommended mode is "Only For Local Users".

For example, in the APAC region, assume Contoso has multiple offices in different countries. For many countries, switching to SIP is not possible because the company still has TDM trunks in many local branch offices. Centralization of the TDM trunks is not an option in the APAC region. Moreover, there are more than fifty Contoso branch offices across the APAC region with hundreds of gateways (SBCs).

To build a solution where PSTN services are provided in all local branch offices in the APAC region where centralization of the TDM trunks is not an option, the Contoso administrator pairs one regional SBC in Singapore as the proxy SBC to the Direct Routing service. The direct connection between the local branch offices is not good, but there is a good connection between each local branch office and the regional SBC in Singapore. For the regional SBC, the administrator chooses 'Always Bypass' mode, and for the local downstream SBCs, the administrator chooses 'Only For Local Users' mode.

The following describes two scenarios:

- Scenario 1. The user is in the same location as the SBC defined in the Online Voice Routing Policy
- Scenario 2. The user and gateways are in different sites

Scenario 1. The user is in the same location as the SBC defined in Online Voice Routing Policy

Assume the SBC in Singapore is configured to be a proxy SBC for the local downstream SBCs in Vietnam and Indonesia. The user is in Vietnam within the same location as the local SBC. Online voice routing policies specify that calls in Vietnam (with area code +84) should be routed to the local SBC in Vietnam. All other calls--and, if the SBC in Vietnam fails, calls in Vietnam--should be routed to the proxy SBC in Singapore. The following table summarizes the example configuration.

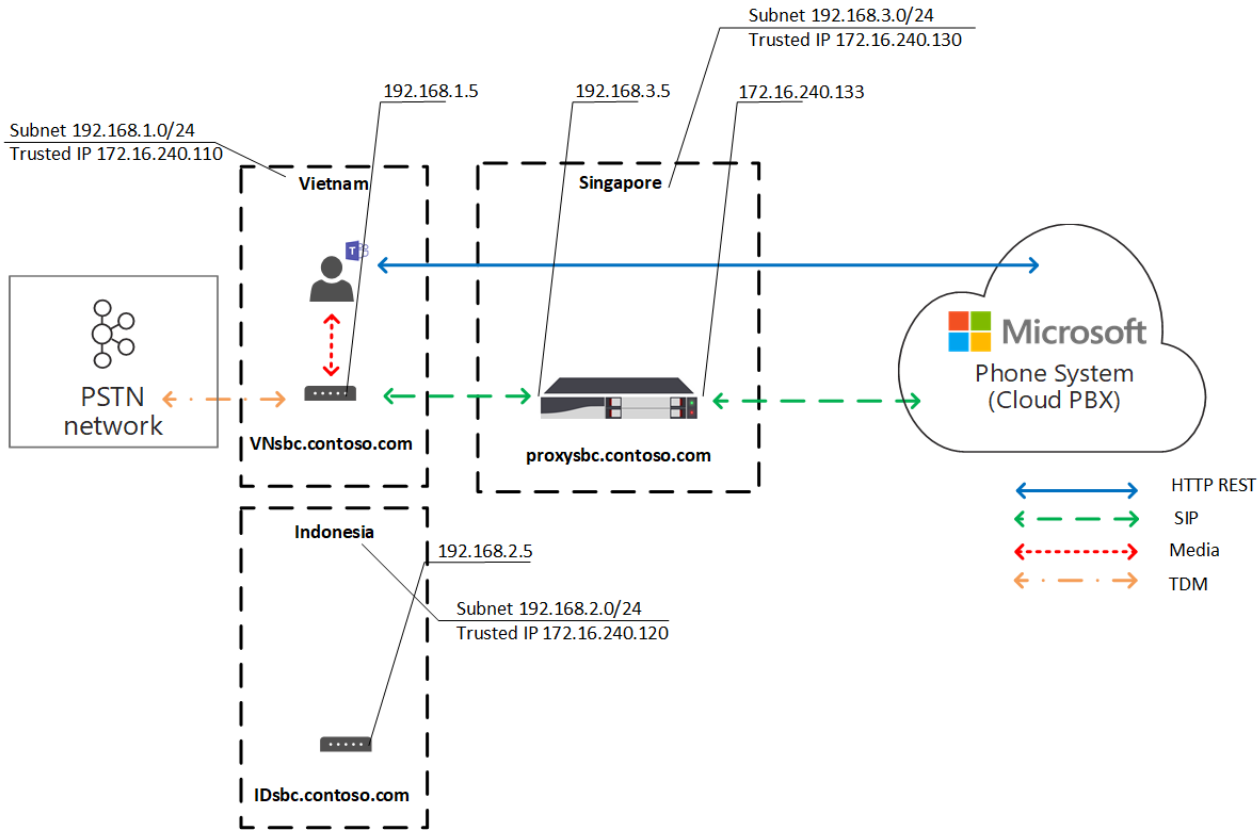
Table 5. Example configuration for 'Only For Local Users' mode Scenario 1

USER PHYSICAL LOCATION	USER MAKES A CALL TO A NUMBER	ONLINE VOICE ROUTING POLICY	MODE CONFIGURED FOR SBC	MEDIA FLOW
Vietnam	+84 4 3926 3000	Priority 1: ^+84(\d{9})$ - VNsbc.contoso.com Priority 2: .* - proxysbc.contoso.com	VNsbc.contoso.com – Only For Local Users proxysbc.contoso.com – Always Bypass	Teams User <–> VNsbc.contoso.com

In the following diagram, a user assigned to the local branch office in Vietnam, while on premises, makes a Direct Routing phone call through Teams.

- The user's Teams client communicates with Phone System directly through the REST API.
- Media generated during the call flows to the local SBC's internal IP address.
- The local SBC redirects the flow to the proxy SBC in Singapore and to the connected local PSTN network.
- The proxy SBC is visible to Phone System through the external IP address only and routes the flow from the downstream SBC (in this case, the local SBC in Vietnam) to Phone System.
- The downstream SBC in the local branch office is not visible to Phone System directly but is mapped within the virtual network topology.

Diagram 7. Traffic flow with "Only For Local Users" mode and the user is in "home" site



Scenario 2. The user and gateways are in different sites

Assume the SBC in Singapore is configured to be a proxy SBC for the local downstream SBCs in Vietnam and Indonesia. The internal user in Indonesia, located in the local branch office, is making a Direct Routing call to Vietnam. Online Voice routing policies specify that calls to Vietnam (with area code +84) should be routed to the local SBC in Vietnam. All other calls--and, in case the SBC in Vietnam fails, calls to Vietnam--should be routed to the proxy SBC in Singapore. The proxy SBC in Singapore is set to 'Always Bypass' mode, and the local SBC in Vietnam is set to 'Only For Local Users' mode. The following table summarizes the example configuration.

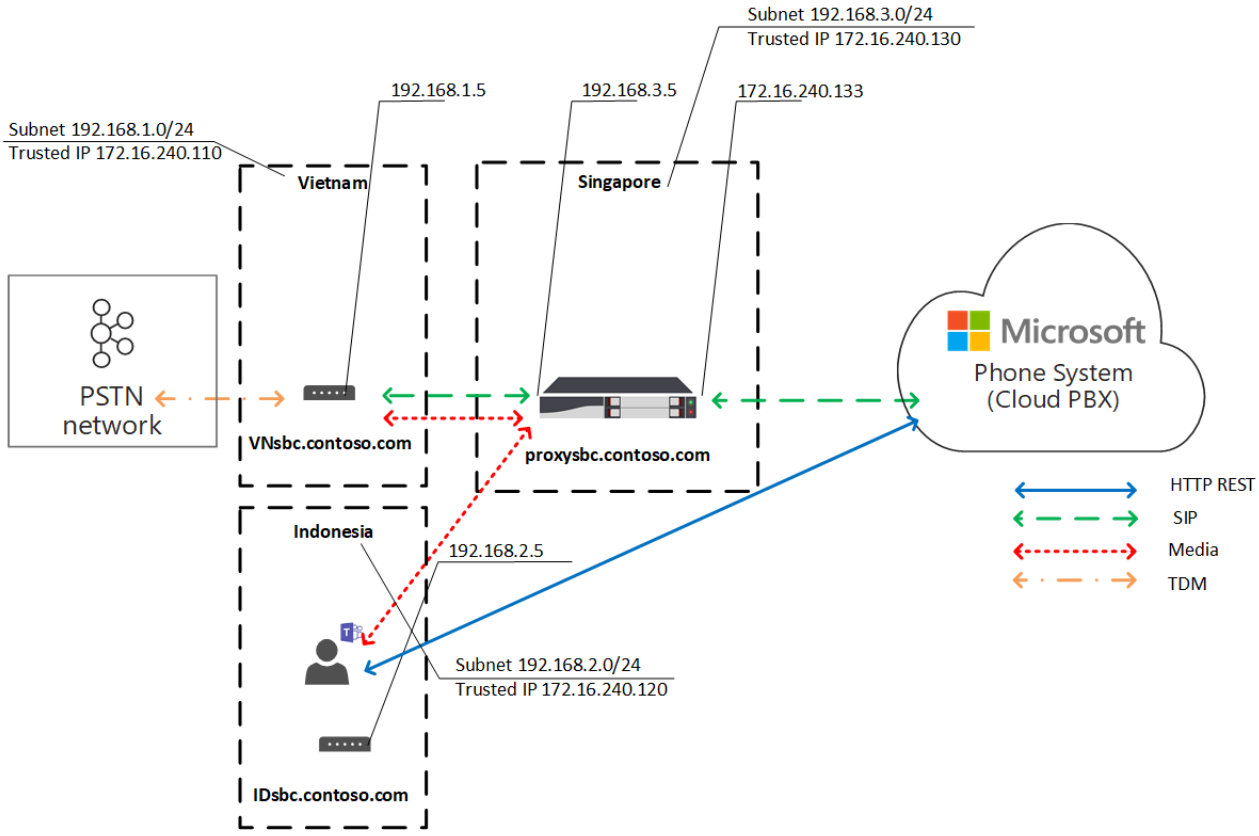
Table 6. User configuration

USER PHYSICAL LOCATION	USER MAKES A CALL TO A NUMBER	ONLINE VOICE ROUTING POLICY	MODE CONFIGURED FOR SBC	MEDIA FLOW
Indonesia	+84 4 3926 3000	Priority 1: ^+84(\d{9})$ - VNsbc.contoso.com Priority 2: .* - proxysbc.contoso.com	VNsbc.contoso.com – Only For Local Users proxysbc.contoso.com – Always Bypass	Teams User <–> proxysbc.contoso.com <–> VNsbc.contoso.com

In the following diagram, the internal user, while on premises in the Indonesian branch office, makes a Direct Routing phone call through Teams to a number in Vietnam.

- The user's Teams client communicates with Phone System directly through the REST API.
- Media generated during the call flows to proxy SBC's internal IP address first.
- The proxy SBC in Singapore redirects the flow to the internal IP address of the downstream SBC in Vietnam and to Phone System.
- The Downstream SBC in Vietnam routes the flow to the connected local PSTN network.
- The proxy SBC is visible to Phone System through the external IP address only.
- The downstream SBCs in local branch offices are not visible to Phone System directly but are mapped within the virtual network topology.

Diagram 8. Traffic flow with "Only For Local Users" mode, and the user is not in "home" site but in the internal network



Known issues

The following is a list of known issues that are currently present in Local Media Optimization. Microsoft is working on addressing these issues.

ISSUE	WORKAROUND
Teams client is not identified as **internal** when the Teams client Public IP matches the customer Trusted IP list.	Local Media Optimization requires that the Teams client subnet matches a tenant configured network subnet
Call escalations result in dropped calls when the Teams client is identified as internal.	Disable Local Media Optimization on the Direct Routing SBC.

Configure Local Media Optimization for Direct Routing

8/5/2020 • 11 minutes to read • Edit Online

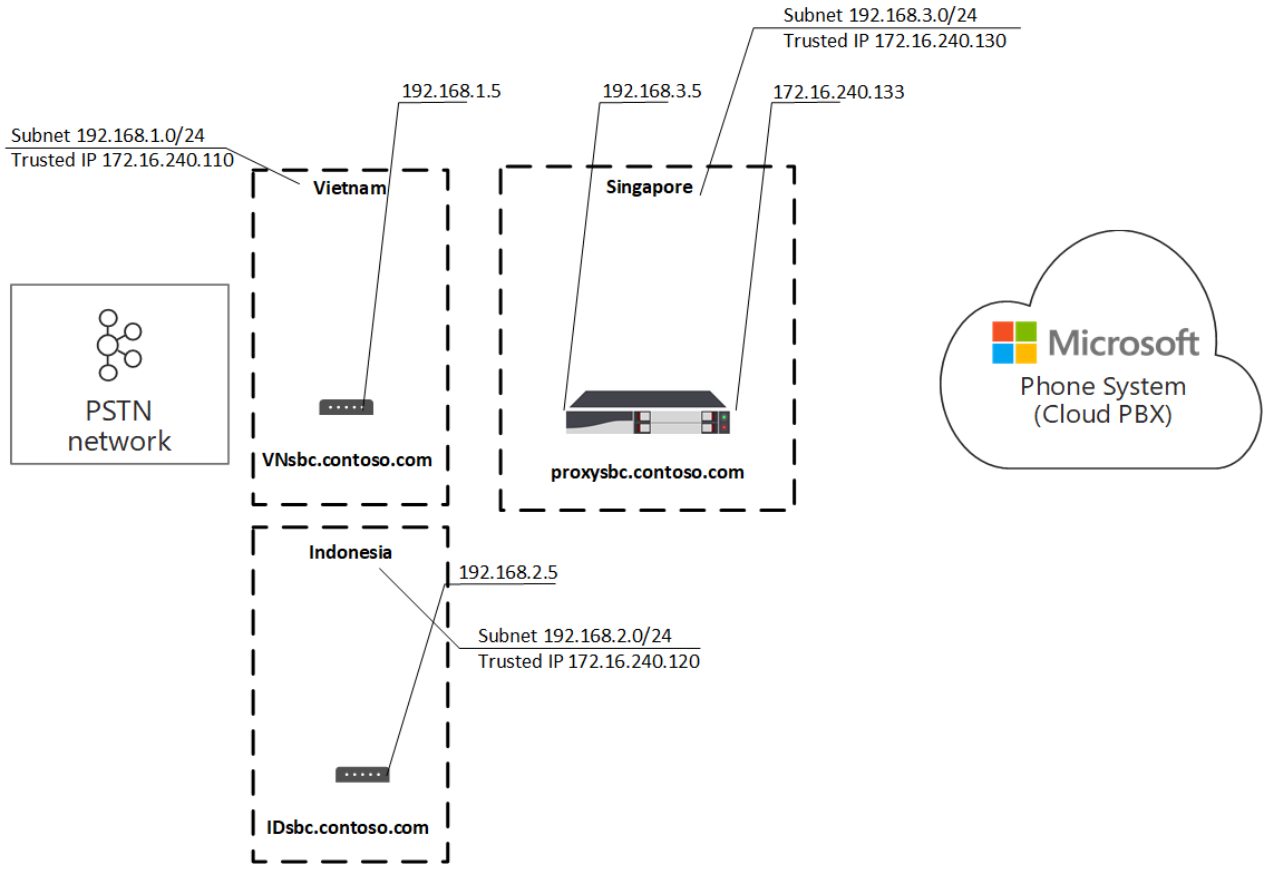
Configuration for Local Media Optimization is based on network settings that are common to other cloud voice features, such as Location-Based Routing and dynamic emergency calling. To learn more about network regions, network sites, network subnets, and trusted IP addresses, see Network settings for cloud voice features.

Before you configure Local Media Optimization, see Local media Optimization for Direct Routing.

To configure Local Media Optimization, the following steps are required. You can use the Teams Admin Center or PowerShell. For details, see Manage your network topology.

1. Configure the user and the SBC sites (as described in this article).
2. Configure the SBCs for Local Media Optimization (according to your SBC vendor specification).

The following diagram shows the network setup used in the examples throughout this article.



Configure the user and the SBC sites

To configure the user and the SBC sites, you will need to:

1. Manage external trusted IP addresses.
2. Define the network topology by configuring the network regions, network sites, and network subnets.
3. Define the virtual network topology by assigning SBC(s) to site(s) with relevant modes and proxy SBC values.

Configure SBC(s) for Local Media Optimization according to the SBC vendor specification

This article describes configuration for Microsoft components. For information on SBC configuration, see your SBC vendor documentation.

Local Media Optimization is supported by the following SBC vendors:

VENDOR	PRODUCT	SOFTWARE VERSION
Audiocodes	Mediant 500 SBC	7.20A.256
	Mediant 800 SBC	7.20A.256
	Mediant 2600 SBC	7.20A.256
	Mediant 4000 SBC	7.20A.256
	Mediant 1000B SBC	7.20A.256
	Mediant 9000 SBC	7.20A.256
	Mediant Virtual Edition SBC	7.20A.256
	Mediant Cloud Edition SBC	7.20A.256
Ribbon SBC Core	SBC 5110	8.2
	SBC 5210	8.2
	SBC 5400	8.2
	SBC 7000	8.2
	SBC SWe	8.2
Ribbon SBC Edge	SBC SWe Lite	8.1.5
	SBC 1000	8.1.5
	SBC 2000	8.1.5
TE-SYSTEMS	anynode	4.0.1+
Oracle	AP 1100	8.4.0.0.0
	AP 3900	8.4.0.0.0
	AP 4600	8.4.0.0.0
	AP 6300	8.4.0.0.0
	AP 6350	8.4.0.0.0

VENDOR	PRODUCT	SOFTWARE VERSION
	VME	8.4.0.0.0

Manage external trusted IP addresses

External trusted IPs are the Internet external IPs of the enterprise network. These IP's are the IP addresses used by Microsoft Teams clients when they connect to Microsoft 365. You need to add these external IPs for each site where you have users using Local Media Optimization.

To add the public IP addresses for each site, use the New-CsTenantTrustedIPAddress cmdlet. You can define an unlimited number of trusted IP addresses for a tenant. If the external IPs seen by Microsoft 365 are both IPv4 and IPv6 addresses, you need to add both types of IP addresses. For IPv4, use mask 32. For IPv6, use mask 128. You can add both individual external IP addresses and external IP subnets by specifying different MaskBits on the cmdlet.

```
New-CsTenantTrustedIPAddress -IPAddress <External IP address> -MaskBits <Subnet bitmask> -Description
<description>
```

Example of adding trusted IP addresses.

```
New-CsTenantTrustedIPAddress -IPAddress 172.16.240.110 -MaskBits 32 -Description "Vietnam site trusted IP"
New-CsTenantTrustedIPAddress -IPAddress 172.16.240.120 -MaskBits 32 -Description "Indonesia site trusted IP"
New-CsTenantTrustedIPAddress -IPAddress 172.16.240.130 -MaskBits 32 -Description "Singapore site trusted IP"
```

Define the network topology

This section describes how to define the network regions, network sites, and network subnets for your network topology.

All parameters are case sensitive so you need to ensure that you use the same case that was used during setup. (For example, GatewaySiteID values "Vietnam" and "vietnam" will be treated as different sites.)

Define network regions

To define network regions, use the New-CsTenantNetworkRegion cmdlet. The RegionID parameter is a logical name that represents the geography of the region and has no dependencies or restrictions. The CentralSite parameter is optional.

```
New-CsTenantNetworkRegion -NetworkRegionID <region ID>
```

The following example creates a network region named APAC:

```
New-CsTenantNetworkRegion -NetworkRegionID "APAC"
```

Define network sites

To define network sites, use the New-CsTenantNetworkSite cmdlet. Each network site must be associated with a network region.

```
New-CsTenantNetworkSite -NetworkSiteID <site ID> -NetworkRegionID <region ID>
```

The following example creates three new network sites, Vietnam, Indonesia, and Singapore in the APAC region:

```
New-CsTenantNetworkSite -NetworkSiteID "Vietnam" -NetworkRegionID "APAC"
New-CsTenantNetworkSite -NetworkSiteID "Indonesia" -NetworkRegionID "APAC"
New-CsTenantNetworkSite -NetworkSiteID "Singapore" -NetworkRegionID "APAC"
```

Define network subnets

To define network subnets and associate them to network sites, use the New-CsTenantNetworkSubnet cmdlet. Each network subnet can only be associated with one site.

```
New-CsTenantNetworkSubnet -SubnetID <Subnet IP address> -MaskBits <Subnet bitmask> -NetworkSiteID <site ID>
```

The following example defines three network subnets and associates them with the three network sites: Vietnam, Indonesia, and Singapore:

```
New-CsTenantNetworkSubnet -SubnetID 192.168.1.0 -MaskBits 24 -NetworkSiteID “Vietnam”
New-CsTenantNetworkSubnet -SubnetID 192.168.2.0 -MaskBits 24 -NetworkSiteID “Indonesia”
New-CsTenantNetworkSubnet -SubnetID 192.168.3.0 -MaskBits 24 -NetworkSiteID “Singapore”
```

Define the virtual network topology

First, the tenant administrator creates a new SBC configuration for each relevant SBC by using the New-CsOnlinePSTNGateway cmdlet. The tenant administrator defines the virtual network topology by specifying the network sites for the PSTN gateway objects using the Set-CsOnlinePSTNGateway cmdlet:

```
PS C:\> Set-CsOnlinePSTNGateway -Identity <Identity> -GatewaySiteID <site ID> -MediaBypass <true/false> -
BypassMode <Always/OnlyForLocalUsers> -ProxySBC  <proxy SBC FQDN or $null>
```

Note the following:

- If the customer has a single SBC, the -ProxySBC parameter must be either mandatory $null or SBC FQDN value (Central SBC with centralized trunks scenario).
- The -MediaBypass parameter must be set to $true in order to support Local Media Optimization.
- If the SBC doesn’t have the -BypassMode parameter set, X-MS headers will not be sent.
- All parameters are case sensitive so you need to ensure that you use the same case that was used used during setup. (For example, GatewaySiteID values ”Vietnam” and ”vietnam” will be treated as different sites.)

The following example adds three SBCs to the network sites Vietnam, Indonesia, and Singapore in the APAC region with mode Always bypass:

```
Set-CSOnlinePSTNGateway -Identity “proxysbc.contoso.com” -GatewaySiteID “Singapore” -MediaBypass $true -
BypassMode “Always” -ProxySBC $null

Set-CSOnlinePSTNGateway -Identity “VNsbc.contoso.com” -GatewaySiteID “Vietnam” -MediaBypass $true -BypassMode
“Always” -ProxySBC “proxysbc.contoso.com”

Set-CSOnlinePSTNGateway -Identity “IDsbc.contoso.com” -GatewaySiteID “Indonesia” -MediaBypass $true -
BypassMode “Always” -ProxySBC “proxysbc.contoso.com”
```

Note: To ensure uninterrupted operations when Local Media Optimization and Location-Based Routing (LBR) are configured at the same time, downstream SBCs must be enabled for LBR by setting the GatewaySiteLbrEnabled parameter to $true for each downstream SBC. (This setting is not mandatory for the proxy SBC.)

Based on the information above, Direct Routing will include three proprietary SIP Headers to SIP Invites and Re-invites as shown in the following table.

X-MS Headers introduced in Direct Routing on Invites and Re-Invites if BypassMode is defined:

HEADER NAME	VALUES	COMMENTS
X-MS-UserLocation	internal/external	Indicates if user is internal or external
Request-URI INVITE sip: +84439263000@VNsbc.contoso.com SIP /2.0	SBC FQDN	The FQDN which is targeted for the call even if the SBC is not directly connected to Direct Routing
X-MS-MediaPath	Example: proxysbc.contoso.com, VNsbc.contoso.com	Order of SBCs that should be used for Media path between the user and target SBC. The final SBC is always last
X-MS-UserSite	usersiteID	String defined by tenant administrator

Call flows

The following shows call flows for two modes:

- Always Bypass
- Only for local users

Always Bypass mode

Always Bypass mode is the simplest option to configure. The tenant administrator can configure a single site for all users and SBCs if all SBCs are reachable from any site.

The examples show Always bypass mode for the following scenarios:

- Outbound calls and the user is in the same location as the SBC
- Inbound calls and the user is in the same location as the SBC
- Outbound calls and the user is external
- Inbound calls and the user is external

The following table shows the FQDN and IP addresses used in the examples:

FQDN	SBC EXTERNAL IP ADDRESS	SBC INTERNAL IP ADDRESS	INTERNAL SUBNET	LOCATION	EXTERNAL NAT (TRUSTED IP)
VNsbc.contoso.com	None	192.168.1.5	192.168.1.0/24	Vietnam	172.16.240.110
IDsbc.contoso.com	None	192.168.2.5	192.168.2.0/24	Indonesia	172.16.240.120
proxysbc.contoso.com	172.16.240.133	192.168.3.5	192.168.3.0/24	Singapore	172.16.240.130

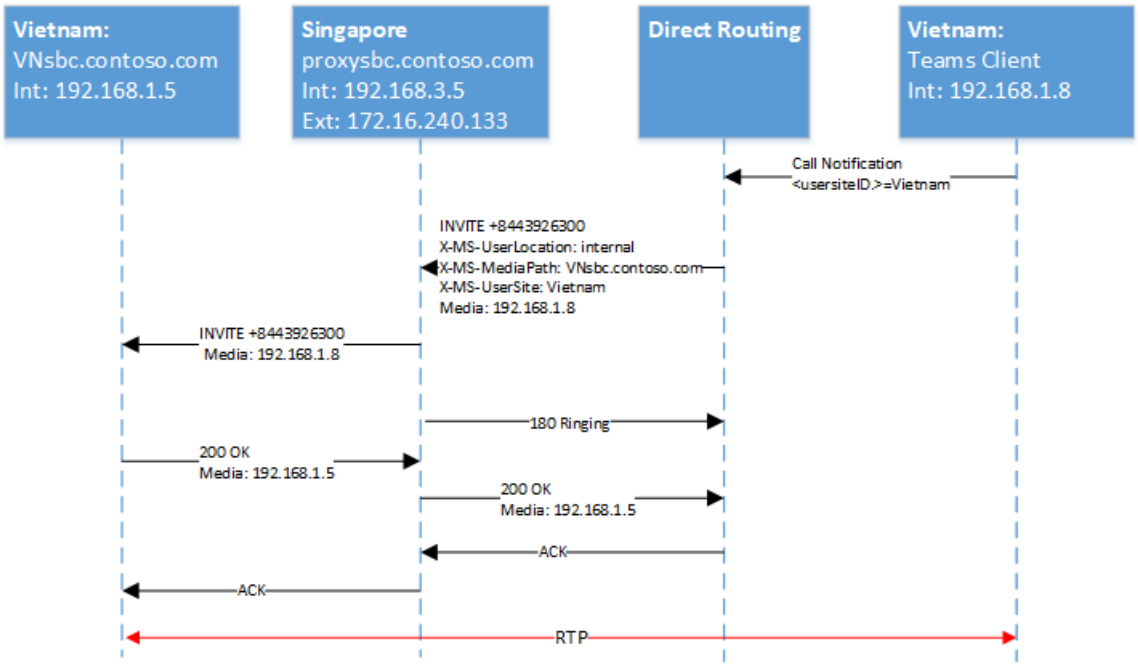
Outbound calls and the user is in the same location as the SBC with Always Bypass

MODE	USER	LOCATION	CALL DIRECTION
AlwaysBypass	Internal	The same site as SBC	Outbound

The following table shows the end user configuration and action:

USER PHYSICAL LOCATION	USER MAKES OR RECEIVES A CALL TO/FROM NUMBER	USER PHONE NUMBER	ONLINE VOICE ROUTING POLICY	MODE CONFIGURED FOR SBC
Vietnam	+84 4 3926 3000	+84 4 5555 5555	Priority 1: ^+84(\d{9})$ - VNsbc.contoso.com Priority 2: .* - proxysbc.contoso.com	VNsbc.contoso.com – Always Bypass proxysbc.contoso.com – Always Bypass

The following diagram shows the SIP ladder for an outbound call with Always bypass mode, and the user in the same location as the SBC.



The following table shows the X-MS headers sent by Direct Routing:

PARAMETER	EXPLANATION
Invite +8443926300@VNsbc.contoso.com	The target FQDN of the SBC as defined in the Online Voice Routing Policy is sent in the Request URI
X-MS-UserLocation: internal	The field indicated that user is located inside the corporate network
X-MS-MediaPath: VNsbc.contoso.com	Specifies which SBC the client must traverse to the target SBC. In this case as we have Always Bypass, and the client is internal the target name sent as the only name in the header.
X-MS-UserSite: Vietnam	The field indicated within the site the user is located.

Inbound calls and the user is in the same location as the SBC with Always Bypass

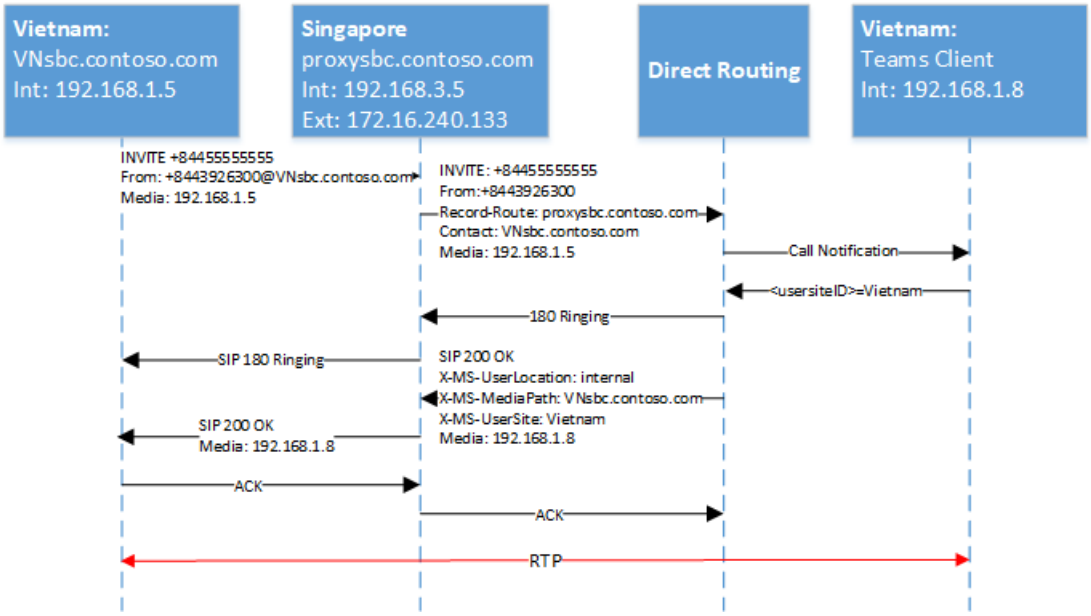
MODE	USER	LOCATION	CALL DIRECTION
AlwaysBypass	Internal	The same site as SBC	Inbound

On an inbound call, the location of the user is unknown, and the SBC must guess where the user is. If the guess is not correct, a re-invite will be required. This case assumes user is internal, media can flow directly, and no further actions are required (re-invite). The SBC connected to the Direct Routing service reports the originating SBC

location by providing Record-Route and Contact fields. Based on these fields, the media path is calculated by Direct Routing.

Note: Given that a user can have multiple endpoints, support of 183 is not possible. The Direct Routing will always use 180 Ringing in this case.

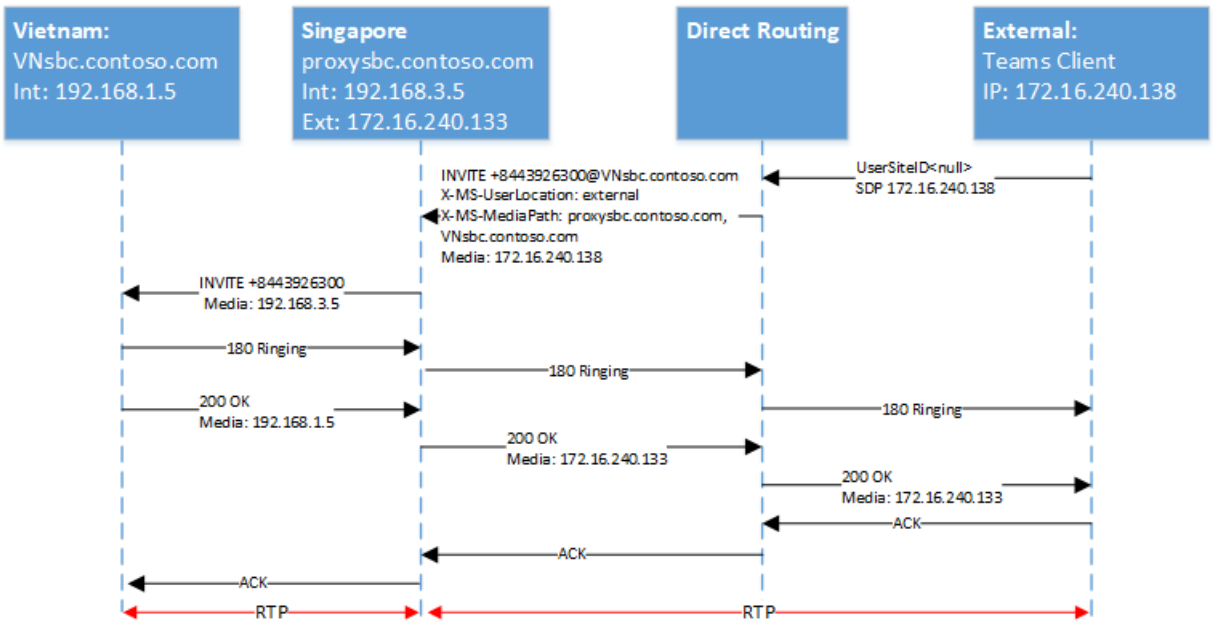
The following diagram shows the SIP ladder for in inbound call with AlwaysBypass mode, and the user is in the same location as the SBC.



Outbound calls and the user is external with Always Bypass

MODE	USER	SITE	CALL DIRECTION
AlwaysBypass	External	N/A	Outbound

The following diagram shows the SIP ladder for an outbound call with AlwaysBypass mode, and the user is external:



The following table shows the X-MS headers sent by the Direct Routing service:

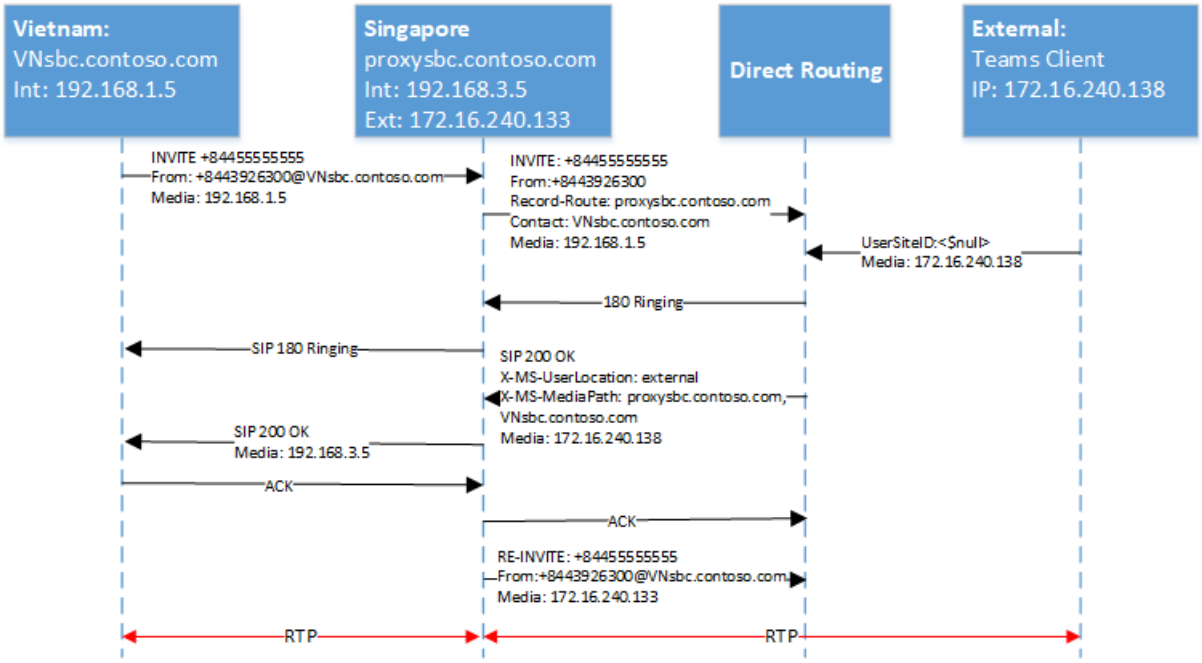
PARAMETER	EXPLANATION
Invite +8443926300@VNsbc.contoso.com	The target FQDN of the SBC as defined in the Online Voice Routing Policy is sent in the Request URI.
X-MS-UserLocation: external	The field indicated that user is located outside the corporate network.
X-MS-MediaPath: proxysbc.contoso.com, VNsbc.contoso.com	Specifies which SBC the client must traverse to the target SBC. In this case as we have Always Bypass, and the client is external.

Inbound calls and the user is external with Always Bypass

MODE	USER	SITE	CALL DIRECTION
AlwaysBypass	External	N/A	Inbound

For an inbound call, the SBC connected to Direct Routing needs to send a re-invite (by default, local media candidates are always offered) if the location of the user is external. The X-MediaPath is calculated based on Record-Route and the SBC user specified.

The following diagram shows the SIP ladder for an inbound call with AlwaysBypass mode, and the user is external.



Only for local users mode

Local media candidates of the target SBC will be offered only if a user is in the same location as the SBC. In all other cases, media will flow through either an internal or external IP of the proxy SBC.

The following scenarios are described:

- Outbound calls and the user is in the same location as the SBC
- Inbound calls and the user is in the same location as the SBC
- User is not at the same location as the SBC but is in the corporate network
- Inbound calls and the user is internal but is not at the same location as the SBC

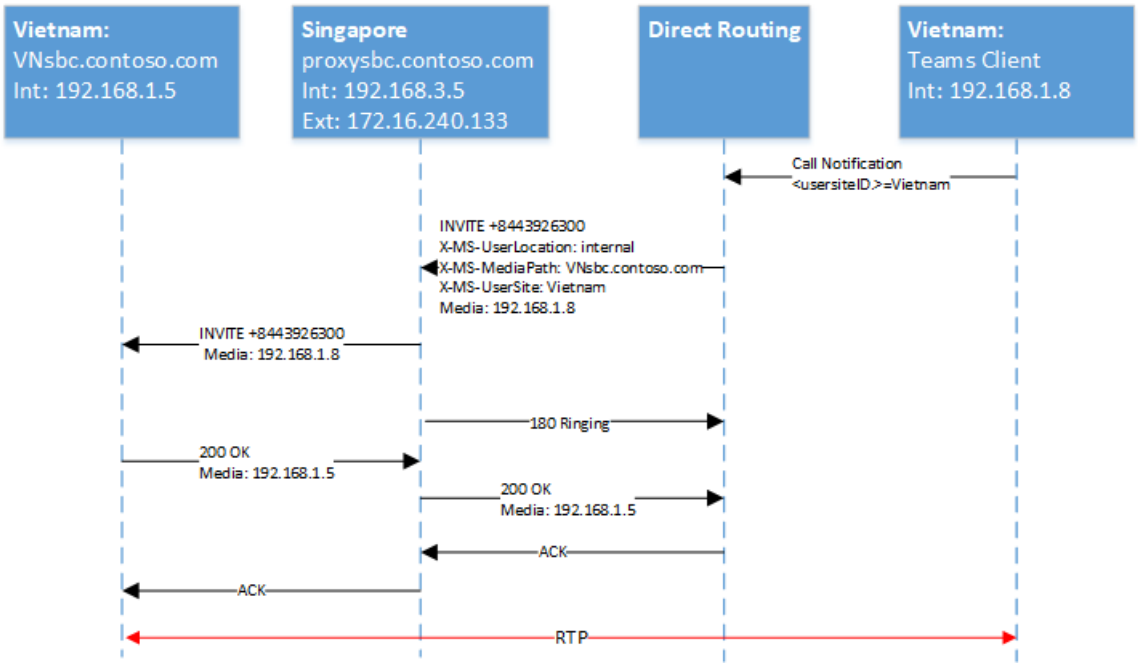
The following table shows end user configuration and action:

USER PHYSICAL LOCATION	USER MAKES OR RECEIVES A CALL TO/FROM NUMBER	USER PHONE NUMBER	ONLINE VOICE ROUTING POLICY	MODE CONFIGURED FOR SBC
Vietnam	+84 4 3926 3000	+84 4 5555 5555	Priority 1: ^+84(\d{9})$ - VNsbc.contoso.com Priority 2: .* - proxysbc.contoso.com	VNsbc.contoso.com – OnlyForLocalUsers Proxysbc.contoso.com – Always Bypass

Outbound calls and the user is in the same location as the SBC with Only for local users

MODE	USER	SITE	CALL DIRECTION
OnlyForLocalUsers	Internal	Same as SBC	Outbound

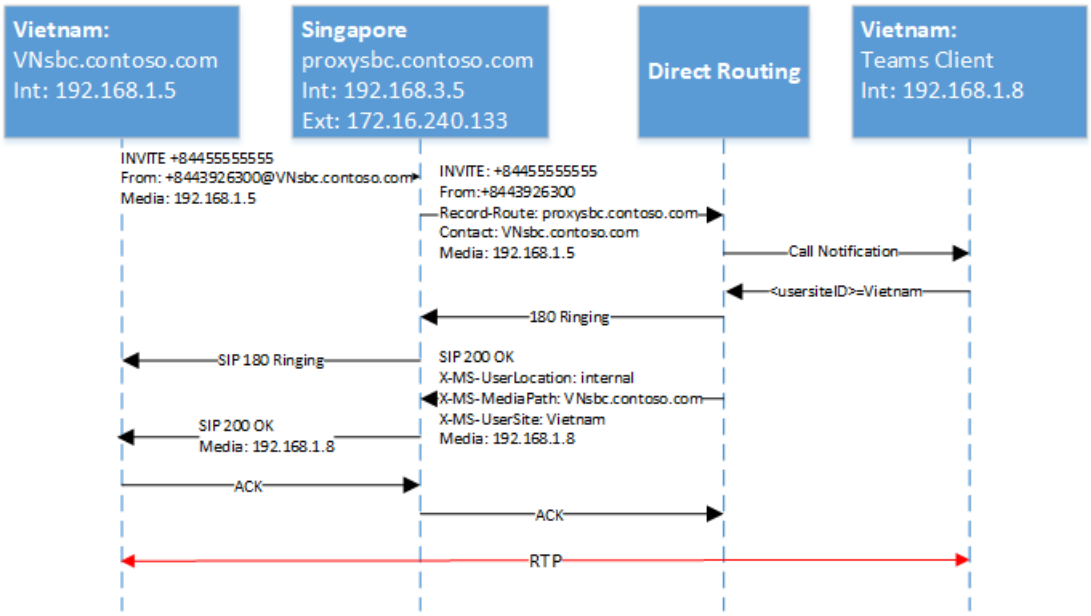
The following diagram shows an outbound call with OnlyForLocalUsers mode, and the user is in the same location as the SBC. This is the same flow shown in Outbound calls when the user is in the same location as the SBC.



Inbound calls and the user is in the same location as the SBC with Only for local users

MODE	USER	SITE	CALL DIRECTION
OnlyForLocalUsers	Internal	Same as SBC	Inbound

The following diagram shows an inbound call with OnlyForLocalUsers mode, and the user is in the same location as the SBC. This is the same flow as shown in Inbound calls when the user is in the same location as the SBC.

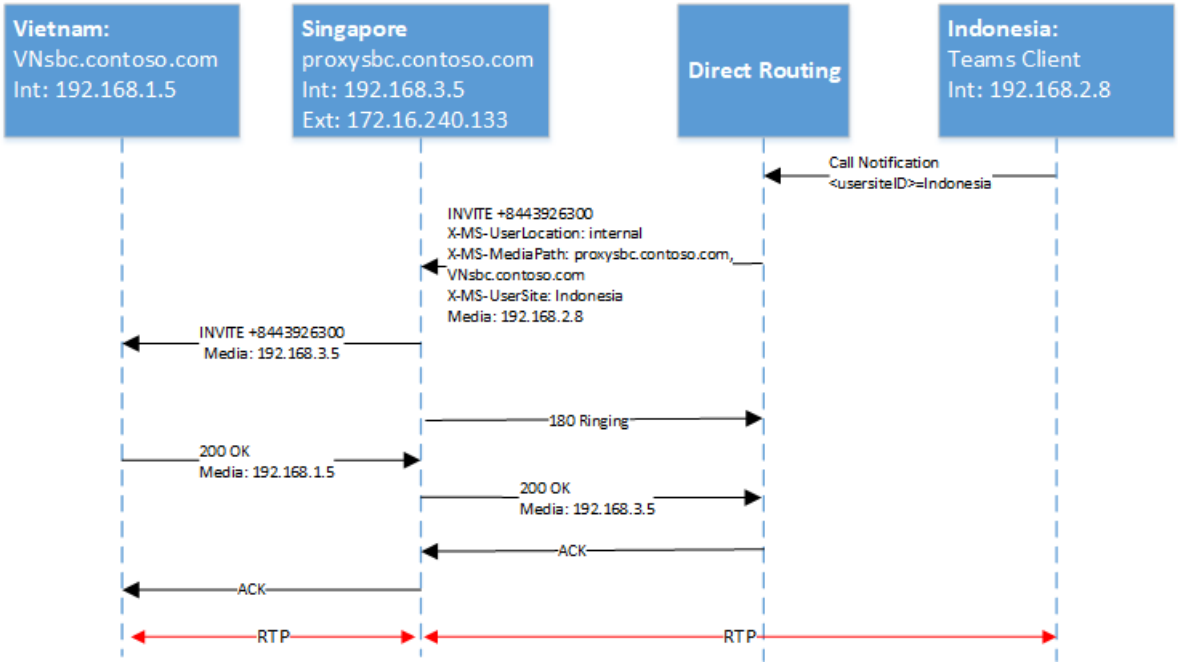


User is not at the same location as the SBC but is in the corporate network with Only for local users

MODE	USER	SITE	CALL DIRECTION
OnlyForLocalUsers	Internal	Different from SBC	Outbound

Direct routing calculates X-MediaPath based on the reported location of the user and mode configured on the SBC.

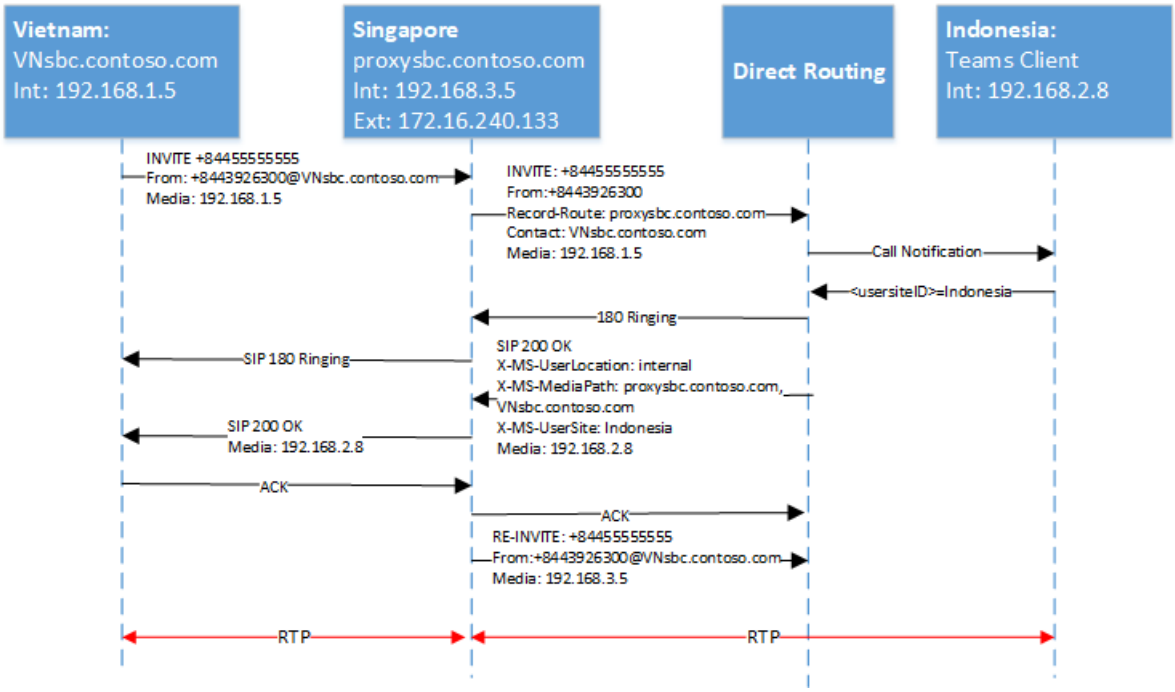
The following diagram shows an outbound call with OnlyForLocalUsers mode, and an internal user who is not at the same location as the SBC.



Inbound call and the user is internal but is not at the same location as the SBC with Only for local users

MODE	USER	SITE	CALL DIRECTION
OnlyForLocalUsers	Internal	Different from SBC	Inbound

The following diagram shows an inbound call with OnlyForLocalUsers mode, and an internal user who is not at the same location as the SBC.


Vietnam:
VNsbc.contoso.com
Int: 192.168.1.5
Singapore
proxysbc.contoso.com
Int: 192.168.3.5
Ext: 172.16.240.133
Direct Routing
Indonesia:
Teams Client
Int: 192.168.2.8
INVITE +84455555555
From: +8443926300@VNsbc.contoso.com
Media: 192.168.1.5
INVITE: +84455555555
From:+8443926300
Record-Route: proxysbc.contoso.com
Contact: VNsbc.contoso.com
Media: 192.168.1.5
Call Notification
<usersiteID>=Indonesia
180 Ringing
SIP 180 Ringing
SIP 200 OK
X-MS-UserLocation: internal
X-MS-MediaPath: proxysbc.contoso.com,
VNsbc.contoso.com
X-MS-UserSite: Indonesia
Media: 192.168.2.8
SIP 200 OK
Media: 192.168.2.8
ACK
ACK
RE-INVITE: +84455555555
From:+8443926300@VNsbc.contoso.com
Media: 192.168.3.5
RTP
RTP

User accounts in a hybrid environment with PSTN connectivity

6/10/2020 • 2 minutes to read • Edit Online

About the environment

This article applies to environments in which you have all of the following:

- Skype for Business Server or Lync Server 2013
- An Microsoft 365 or Office 365 organization
- Hybrid connectivity configured between the Skype for Business Server and Skype for Business Online or Microsoft Teams tenant
- Users who are enabled to make and receive Public Switched Telephone Network (PSTN) calls to and from the client

If you have a different environment (such as Skype for Business Cloud Connector Edition), hybrid is not configured, or your users are not enabled for PSTN calls, the supportability matrix will be different.

About the combinations and the supportability statement

A Skype for Business hybrid environment with PSTNconnectivity provides flexibility regarding where user services are provided and how user accounts are provisioned and managed. But the abundance of options might create some unsupported combinations. This section explains different combinations of user creation, followed by a supportability statement.

Definitions:

- **Enterprise Voice:** Option to provide access to PSTN for users with on-premises Skype for Business user account. On-premises Skype for Business Mediation server provides interconnectivity to PSTN.
- **Hybrid Voice Connectivity:** Option to provide access to PSTN for users with Skype for Business Online account. On-premises Skype for Business Mediation server provides interconnectivity to PSTN.
- **Direct routing:** Option to provide access to PSTN for users with online Skype for Business account, Microsoft Teams license, using Microsoft Teams client. The SBC is connected to the SIP Proxy in Microsoft 365 or Office 365 without need for any on-premises software from Microsoft.

The environment supports the following combinations:

- **Scenario 1:** User account in Skype for Business on-premises and will use the Skype for Business client with Enterprise Voice
- **Scenario 2:** User account in Skype for business online and will use the Skype for Business client with Hybrid Voice Connectivity
- **Scenario 3:** User account in Skype for Business online with Microsoft Teams license and will use Teams client

Supportability matrix

USER OBJECT CREATED IN	USER'S SKYPE FOR BUSINESS SERVICE PROVIDER	USER'S CLIENT	VOICE OPTION	SUPPORTED
On premises AD	On premises	Skype for Business	Enterprise Voice	Yes

USER OBJECT CREATED IN	USER'S SKYPE FOR BUSINESS SERVICE PROVIDER	USER'S CLIENT	VOICE OPTION	SUPPORTED
On premises AD	Online	Skype for Business	Hybrid Voice Connectivity	Yes
On premises AD	Online	Microsoft Teams	Direct Routing	Yes
Unsupported combinations				
Azure AD	On premises/online	Skype for Business/Microsoft Teams	Enterprise Voice/Hybrid Voice Connectivity/Direct Routing	No, user object MUST be created in on-premises AD first
On premises AD	On premises	Microsoft Teams	Enterprise Voice/Hybrid Voice Connectivity/Direct Routing	No, Microsoft Teams client is not supported with on-premises Skype for Business
On premises AD	Online	Skype for Business	Direct Routing	No, Direct Routing is not supported with Skype for Business client

Supportability statement for the hybrid environment with PSTN

For all users, the user object **must** be created in the on-premises AD and synchronized to the Azure AD using the Azure AD Connect tool. Enabling users for Teams/Skype for Business **is not supported** if the user object is created directly in the Azure AD in a hybrid configuration. For new users, such as a new hire, who will be enabled directly for Teams, the user must be enabled for Skype for Business using on premises Skype for Business management tools. Creating users in online Skype for Business or Teamswithout first enabling them in on-premises pool with Enterprise Voice **is not supported**. For more information on this, look into Plan Phone System with on-premises PSTN connectivity in Skype for Business Server.

Migrate to Direct Routing

9/3/2020 • 3 minutes to read • Edit Online

This article describes what is needed to migrate to Direct Routing from a Skype for Business Online and Microsoft Teams configuration perspective. This article covers migrating from the following:

- Phone System with Calling Plans (for Teams and Skype for Business Online)
- Phone System with on-premises PSTN Connectivity in Skype for Business Server (for Skype for Business Online)
- Phone System with on-premises PSTN Connectivity by using the Cloud Connector Edition (for Skype for Business Online)

In addition to these configuration steps, configuration is also required on the Session Border Controller (SBC) to route the calls to the new route. That is outside the scope of this document. For more information, see your SBC vendor documentation.

User provisioning end-state for various PSTN connectivity options

The following table shows the end-state for a user provisioned for the selected PSTN connectivity options with Phone System. Only attributes relevant for voice are shown.

USER OBJECT ATTRIBUTES	PHONE SYSTEM WITH CALLING PLANS	PHONE SYSTEM WITH ON-PREMISES PSTN CONNECTIVITY VIA SKYPE FOR BUSINESS SERVER	PHONE SYSTEM WITH ON-PREMISES PSTN CONNECTIVITY VIA CLOUD CONNECTOR	PHONE SYSTEM WITH ON-PREMISES PSTN CONNECTIVITY VIA DIRECT ROUTING
Client	Skype for Business or Teams	Skype for Business	Skype for Business	Teams
Licenses	Skype Business Online Plan 2 MCOProfessional or MCOSTANDARD) Phone System (MCOEV) Calling Plans Teams	Skype Business Online Plan 2 (MCOProfessional or MCOSTANDARD) Phone System (MCOEV)	Skype Business Online Plan 2 (MCOProfessional or MCOSTANDARD) Phone System (MCOEV)	Skype Business Online Plan 2 (MCOProfessional or MCOSTANDARD Phone System (MCOEV) Teams

USER OBJECT ATTRIBUTES	PHONE SYSTEM WITH CALLING PLANS	PHONE SYSTEM WITH ON-PREMISES PSTN CONNECTIVITY VIA SKYPE FOR BUSINESS SERVER	PHONE SYSTEM WITH ON-PREMISES PSTN CONNECTIVITY VIA CLOUD CONNECTOR	PHONE SYSTEM WITH ON-PREMISES PSTN CONNECTIVITY VIA DIRECT ROUTING
OnPremLineURI	N/A	The phone number must be synced from the on-premises AD.	The phone number can be managed either in on-premises Active Directory or in Azure Active Directory.	The phone number can be managed either in on-premises Active Directory or in Azure Active Directory. However, if the organization has on-premises Skype for Business, the number must be synced from the on-premises Active Directory.
LineURI	PSTN Calling phone number	Set automatically from the OnPremLineURI parameter	Set automatically from the OnPremLineURI parameter	Set automatically from the OnPremLineURI parameter
EnterpriseVoiceEnabled	True	True	True	True
HostedVoiceMail	True	True	True	True
VoicePolicy	BusinessVoice	HybridVoice	HybridVoice	HybridVoice
HostedVoiceMailPolicy	BusinessVoice	BusinessVoice	BusinessVoice	BusinessVoice
VoiceRoutingPolicy	Has a value	Has a value	Has a value	N/A
OnlineVoiceRoutingPolicy	$Null	$Null	$Null	Has a value
TeamsUpgradePolicy[1]	TeamsOnly, SfBOnly	$Null	$Null	TeamsOnly
TeamsCallingPolicy AllowPrivateCalling	True	N/A	N/A	True
TeamsCallingPolicy AllowGroupCalling	True	N/A	N/A	True

[1] Choosing the right mode of the TeamsUpgradePolicy depends on the scenario. Please read about the voice experience in different modes in Migration and interoperability Guidance for organizations using Teams together with Skype for Business.

As part of this effort, Microsoft recently updated the "Microsoft Teams admin center" (also known as Modern Portal) to reflect the new management model based on coexistence modes. In Modern Portal, configuring TeamsUpgradePolicy will now automatically also set TeamsInteropPolicy to consistent value, so TeamsInteropPolicy is no longer exposed in the user interface. However, admins using PowerShell must still set both TeamsUpgradePolicy and TeamsInteropPolicy together to ensure proper routing. After the transition to

TeamsUpgradePolicy is complete, it will no longer be necessary to also set TeamsInteropPolicy.

For more information, please refer to Migration and interoperability Guidance for organizations using Teams together with Skype for Business.

Migrating from Calling Plans

For more information about migrating from Calling Plans, see:

- Set up Calling Plans
- Set-CsOnlineVoice User
- Get-CsOnlineLisLocation

It is recommended that you remove previously configured licensing plan information as follows:

```
$companyname = “contoso”
$lic1 = $companyname + “:MCOPSTN1”
$lic2 = $companyname + “:MCOPSTN2”
Set-MsolUserLicense -UserPrincipalName <UPN> -RemoveLicenses $lic1
Set-MsolUserLicense -UserPrincipalName <UPN> -RemoveLicenses $lic2
```

Migrating from Office 365 Phone System with on-premises PSTN connectivity in Skype for Business Server

For more information about migrating from Phone System with on-premises PSTN connectivity in Skype for Business Server, see the following:

- Planning
- Deploying

It is recommended that you remove previously configured voice routing information as follows:

```
Grant-CsVoiceRoutingPolicy -PolicyName $NULL -Identity <UPN>
```

NOTE

If a global CsVoiceRoutingPolicy is configured, it is recommended that you remove any PSTN usages associated with this global policy.

Migrating from Office 365 Phone System with on-premises PSTN connectivity via Cloud Connector Edition

IMPORTANT

Cloud Connector Edition will retire July 31, 2021 along with Skype for Business Online. Once your organization has upgraded to Teams, learn how to connect your on-premises telephony network to Teams using Direct Routing.

For more information about migrating from Phone System with on-premises PSTN connectivity via Cloud Connector, see the following:

- Planning
- Deploying

- User configuration

It is recommended that you remove previously configured voice routing information as follows:

```
Grant-CsVoiceRoutingPolicy -PolicyName $NULL -Identity <UPN>
Set-CsUserPstnSettings -Identity <UPN> -AllowInternationalCalls $false -HybridPSTNSite $null
```

Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Grant-CsTeamsUpgradePolicy

Get-CsTeamsUpgradePolicy

New-CsTeamsUpgradePolicy

Remove-CsTeamsUpgradePolicy

Set-CsTeamsUpgradePolicy

Get-CsTeamsUpgradeConfiguration

Set-CsTeamsUpgradeConfiguration

Monitor and troubleshoot Direct Routing

4/27/2020 • 3 minutes to read • Edit Online

This article describes how to monitor and troubleshoot your Direct Routing configuration.

The ability to make and receive calls by using Direct Routing involves the following components:

- Session Border Controllers (SBCs)
- Direct Routing components in the Microsoft Cloud
- Telecom trunks

If you have difficulties troubleshooting issues, you can open a support case with your SBC vendor or Microsoft.

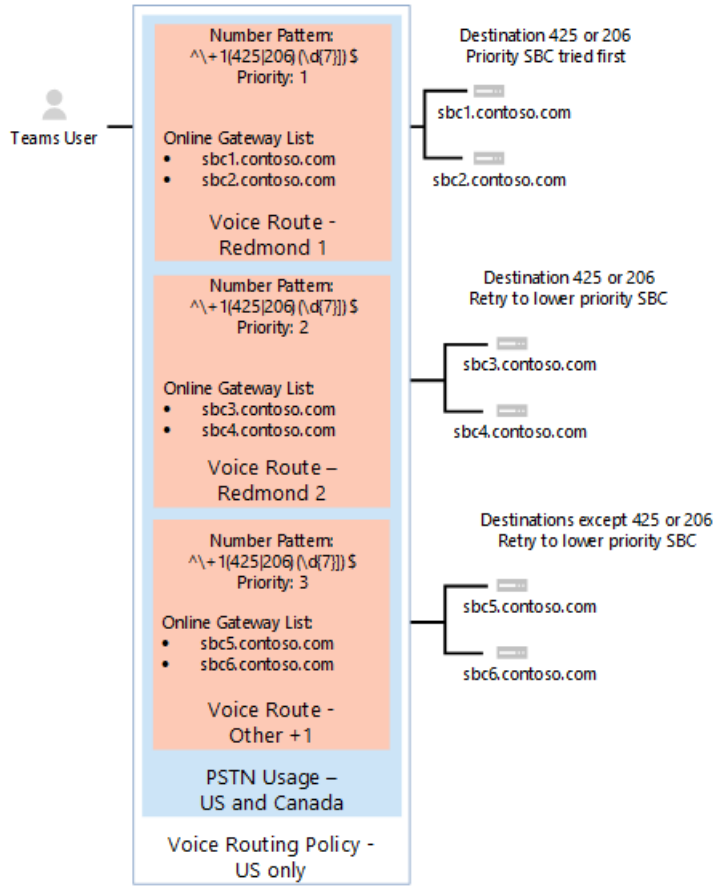
Microsoft is working on providing more tools for troubleshooting and monitoring. Please check the documentation periodically for updates.

Monitoring availability of Session Border Controllers using Session Initiation Protocol (SIP) options messages

Direct Routing uses SIP options sent by the Session Border Controllers to monitor SBC health. There are no actions required from the tenant administrator to enable the SIP options monitoring. The collected information is taken into consideration when routing decisions are made.

For example, if, for a specific user, there are several SBCs available to route a call, Direct Routing considers the SIP options information received from each SBC to determine routing.

The following diagram shows an example of the configuration:



When a user makes a call to number +1 425 <any seven digits>, Direct Routing evaluates the route. There are two SBCs in the route: sbc1.contoso.com and sbc2.contoso.com. Both SBCs have equal priority in the route. Before picking an SBC, the routing mechanism evaluates the health of the SBCs based on when the SBC sent the SIP options last time.

An SBC is considered healthy if statistics at the moment of sending the call shows that the SBC sends options every minute.

When a call is made, the following logic applies:

- The SBC was paired at 11:00 AM.
- The SBC sends options at 11:01 AM, 11:02 AM, and so on.
- At 11:15, a user makes a call and the routing mechanism selects this SBC.

Direct Routing takes the regular interval options three times (the regular interval is one minute). If options were send during the last three minutes, the SBC is considered healthy.

If the SBC in the example sent options at any period between 11:12 AM and 11:15 AM (the time the call was made), it is considered healthy. If not, the SBC will be demoted from the route.

Demotion means that the SBC will not be tried first. For example, we have sbc1.contoso.com and sbc2.contoso.com with equal priority.

If sbc1.contoso.com does not send SIP options on a regular interval as previously described, it is demoted. Next, sbc2.contoso.com tries for the call. If sbc2.contoso.con cannot deliver the call, the sbc1.contoso.com (demoted) is tried again before a failure is generated.

If two (or more) SBCs in one route are considered healthy and equal, Fisher-Yates shuffle is applied to distribute the calls between the SBCs.

Monitor Call Quality Analytics dashboard and SBC logs

In some cases, especially during the initial pairing, there might be issues related to misconfiguration of the SBCs or the Direct Routing service.

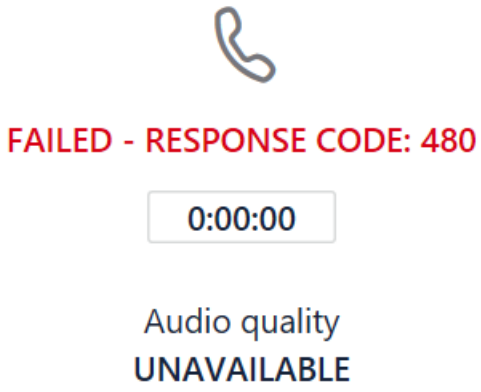
You can use the following tools to monitor your configuration:

- Call Quality Dashboard
- SBC logs

The Direct Routing service has very descriptive error codes reported to either Call Analytics or the SBC logs.

The Call Quality Dashboard provides information about call quality and reliability. To learn more about how to troubleshoot issues using Call Analytics, see Turning on and using Call Quality Dashboard for Microsoft Teams and Skype for Business Online and Use Call Analytics to troubleshoot poor call quality.

In case of call failures, Call Analytics provides standard SIP codes to help you with troubleshooting.



However, Call Analytics can only help when calls reach the internal components of Direct Routing and fail. In case of issues with SBC pairing or issues where SIP "Invite" was rejected (for example, the name of the trunk FQDN is misconfigured), Call Analytics will not help. In this case, refer to the SBC logs. Direct Routing sends a detailed description of issues to the SBCs; these issues can be read from the SBC logs.

Health Dashboard for Direct Routing

7/22/2020 • 6 minutes to read • Edit Online

Health Dashboard for Direct Routing lets you monitor the connection between your Session Border Controller (SBC) and the Direct Routing interface. With Health Dashboard, you can monitor information about your SBC, the telephony service, and the network parameters between your SBC and the Direct Routing interface. This information can help you identify issues, including the reason for dropped calls. For example, the SBC might stop sending calls if a certificate on the SBC has expired or if there are network issues. See the admin roles to learn who has access to the health dashboard.

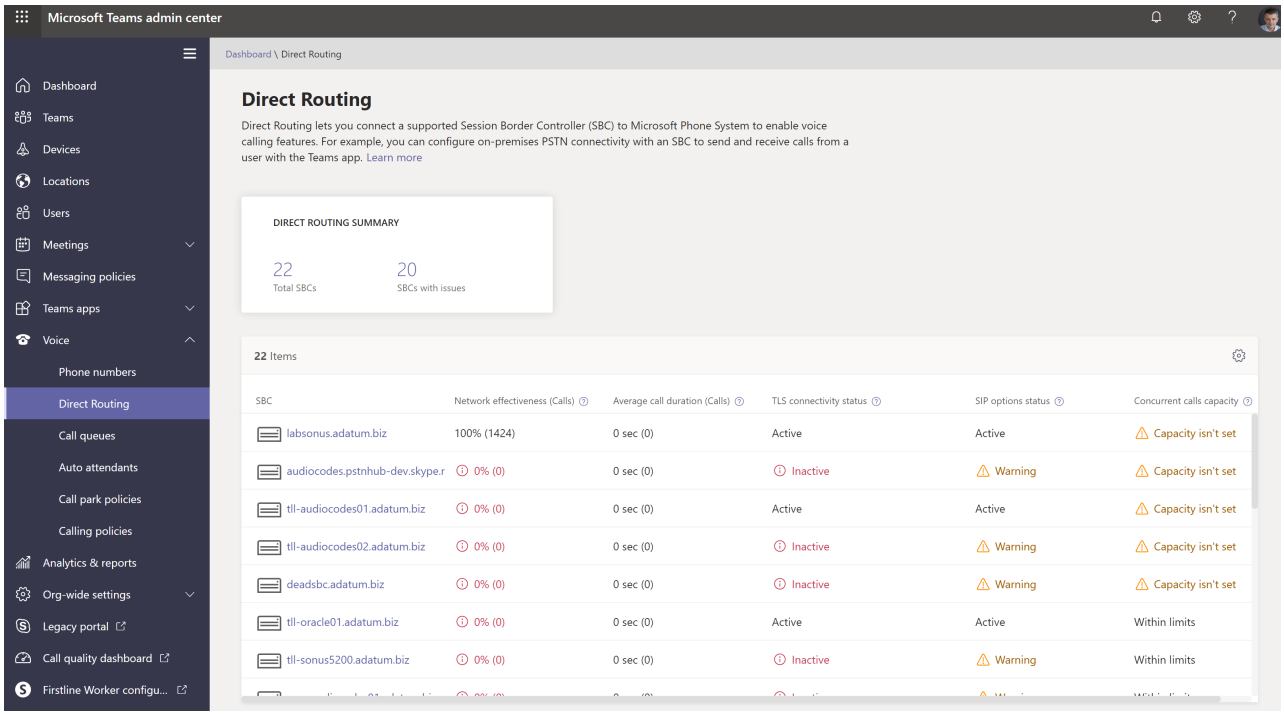
Health Dashboard monitors two levels of information:

- Overall health of the connected SBCs
- Detailed information about the connected SBCs

You can view Health Dashboard in the Microsoft Teams and Skype for Business Admin Center.

Overall health

Health Dashboard provides the following information related to overall health of the connected SBCs:



- **Direct Routing summary** - Shows the total number of SBCs registered in the system. Registration means that the tenant administrator added an SBC by using the New-CsOnlinePSTNGateway command. If the SBC was added in PowerShell, but never connected, the Health Dashboard shows it in an unhealthy status.
- **SBC** - The FQDN of the paired SBC.
- **Network Effectiveness Ratio (NER)** - The NER measures the ability of a network to deliver calls by measuring the number of calls sent versus the number of calls delivered to a recipient.

  The NER measures the ability of networks to deliver calls to the far-end terminal--excluding user actions resulting in call rejections. If the recipient rejected a call or sent the call to voicemail, the call is counted as a successful delivery. This means that an answer message, a busy signal, or a ring with no answer are all

considered successful calls.

For example, assume Direct Routing sent a call to the SBC and the SBC returns SIP code "504 Server Time-out - The server attempted to access another server in attempting to process the request and did not receive a prompt response". This response indicates there is an issue on the SBC side, and this will decrease the NER on the Health Dashboard for this SBC.

Because the action you take might depend on the number of calls affected, Health Dashboard shows how many calls were analyzed to calculate a parameter. If the number of calls is less than 100, the NER might be quite low, but still be normal.

The formula used to calculate NER is:

NER = 100 x (Answered calls + User Busy + Ring no Answer + Terminal Reject Seizures)/Total Calls

- **Average call duration** - Information about average call duration can help you monitor the quality of calls. The average duration of a 1:1 PSTN call is four to five minutes. However, for each company, this average can differ. Microsoft recommends establishing a baseline for the average call duration for your company. If this parameter goes significantly below the baseline, it might indicate that your users are having issues with call quality or reliability and are hanging up earlier than usual. If you start seeing extremely low average call duration, for example 15 seconds, callers might be hanging up because your service is not performing reliably.

  Because the action you take might depend on the number of calls affected, Health Dashboard shows how many calls were analyzed to calculate a parameter.

- **TLS connectivity status** - TLS (Transport Layer Security) connectivity shows the status of the TLS connections between Direct Routing and the SBC. Health Dashboard also analyzes the certificate expiration date and warns if a certificate is set to expire within 30 days so that administrators can renew the certificate before service is disrupted.

  By clicking the Warning message, you can see a detailed issue description in a popup window on the right and recommendations for how to fix the issue.

- **SIP options status** – By default, the SBC sends options messages every minute. This configuration can vary for different SBC vendors. Direct Routing warns if the SIP options are not sent or are not configured. For more information about SIP options monitoring, and conditions when an SBC can be marked as not functional, see Monitor and troubleshoot Direct Routing.

- **Detailed SIP options status** - In addition to showing that there is an issue with SIP options flow, the Health Dashboard also provides detailed descriptions of the errors. You can access the description by clicking the "Warning" message. A pop-up window on the right will show the detailed error description.

  Possible values for SIP options status messages are as follows:

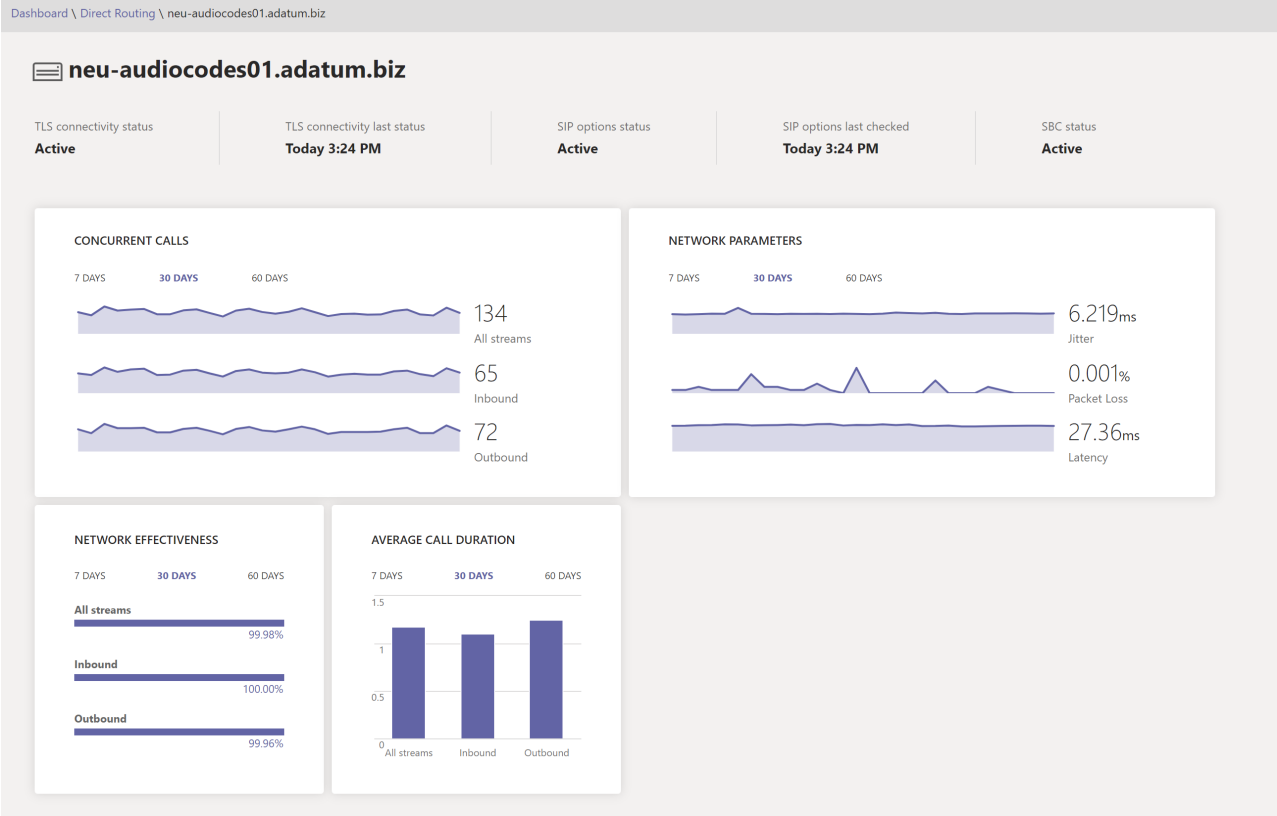
  - Active – The SBC is active--Microsoft Direct Routing service sees the options flowing on a regular interval.
  - Warning, no SIP options - The Session Border Controller exists in the database (your administrator created it using the command New-CsOnlinePSTNGateway). It is configured to send SIP options, but the Direct Routing service never saw the SIP options coming back from this SBC.
  - Warning, SIP Messages aren't configured - Trunk monitoring using SIP options isn't turned on. Microsoft Calling System uses SIP options and Transport Layer Security (TLS) handshake monitoring to detect the health of the connected Session Border Controllers (SBCs) at the application level. You'll have problems if this trunk can be reached at the network level (by ping), but the certificate has expired or the SIP stack doesn't work. To help identify such problems early, Microsoft recommends enabling sending SIP options. Check your SBC manufacturer documentation to configure sending SIP

options.

- **Concurrent calls capacity** - You can specify the limit of concurrent calls that an SBC can handle by using the New- or Set-CsOnlinePSTNGateway command with the -MaxConcurrentSessions parameter. This parameter calculates how many calls were sent or received by Direct Routing using a specific SBC and compares it with the limit set. Note: If the SBC also handles calls to different PBXs, this number will not show the actual concurrent calls.

Detailed information for each SBC

You can also view the detailed information for a specific SBC as shown in the following screenshot:



The detailed view shows the following additional parameters:

- **TLS Connectivity status** – this is the same metric as on the "Overall Health" page;
- **TLS Connectivity last status** – shows time when the SBC made a TLS connection to the Direct Routing service;
- **SIP options status** – the same metric as on the "Overall Health" page.
- **SIP options last checked** – time when the SIP options were received last time.
- **SBC status** – overall status of the SBC, based on all monitored parameters.
- **Concurrent call**- shows how many concurrent calls the SBC handled. This information is useful to predict the number of concurrent channels you need and see the trend. You can slide the data by number of days and call direction (inbound/outbound/All streams).
- **Network parameters** - All network parameters are measured from the Direct Routing interface to the Session Border Controller. For information about the recommended values, see Prepare your organization's network for Microsoft Teams, and look at the Customer Edge to Microsoft Edge recommended values.
    - Jitter – Is the millisecond measure of variation in network propagation delay time computed between two endpoints using RTCP (The RTP Control Protocol).

- Packet Loss – Is a measure of packet that failed to arrive; it is computed between two endpoints.
- Latency - (Also known as round trip time) is the length of time it takes for a signal to be sent plus the length of time it takes for the acknowledgment of that signal to be received. This time delay consists of the propagation times between the two points of a signal.

You can slide the data by number of days and call direction (inbound/outbound/All streams).

Network Effectiveness ratio - This is the same parameter that appears on the Overall Health dashboard, but with the option to slice the data by time series or call direction.

Trunk failover on outbound calls

2/6/2020 • 2 minutes to read • Edit Online

This topic describes how to avoid trunk failovers on outbound calls--from Teams to the Session Border Controller (SBC).

Failover on network errors

If a trunk cannot be connected for any reason, the connection to the same trunk will be tried from a different Microsoft Datacenter. A trunk might not be connected, for example, if a connection is refused, if there is a TLS timeout, or if there are any other network level issues. For example, a connection might fail if an administrator limits access to the SBC only from well-known IP addresses, but forgets to put the IP addresses of all Microsoft Direct Routing datacenters on the Access Control List (ACL) of the SBC.

Failover of specific SIP codes received from the Session Border Controller (SBC)

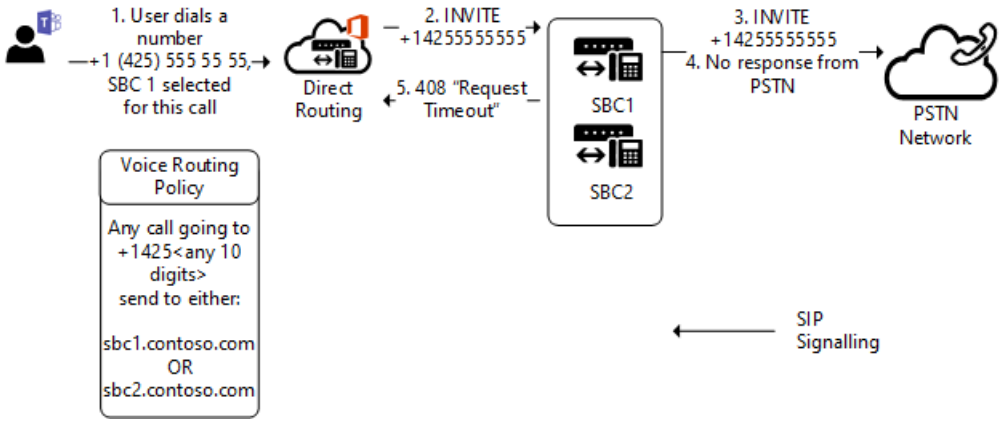
If Direct Routing receives any 4xx or 6xx SIP error codes in response to an outgoing Invite, the call is considered completed by default. Outgoing means a call from a Teams client to the Public Switched Telephone Network (PSTN) with the following traffic flow: Teams Client -> Direct Routing -> SBC -> Telephony network.

The list of SIP Codes can be found in Session Initiation Protocol (SIP) RFC.

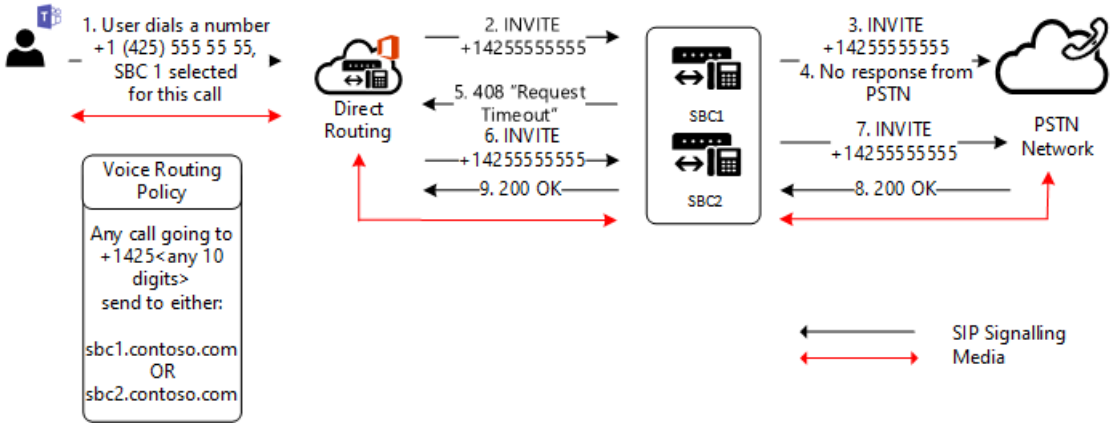
Assume a situation where an SBC replied on an incoming invite with the code "408 Request Timeout: The server could not produce a response within a suitable amount of time, for example, if it could not determine the location of the user in time. The client MAY repeat the request without modifications at any later time."

This particular SBC might be having difficulties connecting to the callee--perhaps because of a network misconfiguration or other error. However, there is one more SBC in the route which might be able to reach the callee.

In the following diagram, when a user makes a call to a phone number, there are two SBCs in the route that can potentially deliver this call. Initially, SBC1.contoso.com is selected for the call, but SBC1.contoso.com isn't able to reach a PTSN network due to a network issue. By default, the call will be completed at this moment.



But there is one more SBC in the route which potentially can deliver the call. If you configure the parameter `Set-CSOnlinePSTNGateway -Identity sbc1.contoso.com -FailoverResponseCodes "408"`, the second SBC will be tried--SBC2.contoso.com in the following diagram:



Setting the parameter -FailoverResponseCodes and specifying the codes helps you fine tune your routing and avoid potential issues when an SBC cannot make a call due to network or other issues.

Default values: 408, 503, 504

Direct Routing media path country codes

4/27/2020 • 3 minutes to read • Edit Online

When choosing a routing path for media, Direct Routing, by default, always assigns a datacenter based on the public IP address of the Session Border Controller (SBC), and always selects the path closest to the SBC datacenter.

However, in some cases the default media path might not be the optimal media path; for example, a public IP from a United States range might be assigned to an SBC located in Europe.

By using the -MediaRelayRoutingLocationOverride parameter with the New-CsOnlinePSTNGateway and Set-CsOnlinePSTNGateway cmdlets, you can specify the preferred region for media traffic. For example, the following command specifies that the preferred region is Germany:

Set-CSOnlinePSTNGateway -Identity sbc1.contoso.com –MediaRelayRoutingLocationOverride DE

Note that Microsoft only recommends setting this parameter if the call logs clearly indicate that the default assignment of the datacenter for the media path does not use the path closest to the SBC datacenter.

Country code reference table

The following table shows the country code values for the -MediaRelayRoutingLocationOverride parameter:

COUNTRY	CODE
Afghanistan	AF
Aland Islands	AX
Albania	AL
Algeria	DZ
American Samoa	AS
Andorra	AD
Angola	AO
Anguilla	AI
Antarctica	AQ
Antigua and Barbuda	AG
Argentina	AR
Armenia	AM
Aruba	AW
Australia	AU

COUNTRY	CODE
Austria	AT
Azerbaijan	AZ
Bahamas	BS
Bahrain	BH
Bangladesh	BD
Barbados	BB
Belarus	BY
Belgium	BE
Belize	BZ
Benin	BJ
Bermuda	BM
Bhutan	BT
Bolivia	BO
Bonaire	BQ
Bosnia and Herzegovina	BA
Botswana	BW
Bouvet Island	BV
Brazil	BR
British Indian Ocean Territory	IO
British Virgin Islands	VG
Brunei	BN
Bulgaria	BG
Burkina Faso	BF
Burundi	BI

COUNTRY	CODE
Cabo Verde	CV
Cambodia	KH
Cameroon	CM
Canada	CA
Cayman Islands	KY
Central African Republic	CF
Chad	TD
Chile	CL
China	CN
Christmas Island	CX
Cocos (Keeling) Islands	CC
Colombia	CO
Comoros	KM
Congo	CG
Congo (DRC)	CD
Cook Islands	CK
Costa Rica	CR
Cote d'Ivoire	CI
Croatia	HR
Cuba	CU
Curacao	CW
Cyprus	CY
Czechia	CZ
Denmark	DK
Djibouti	DJ

COUNTRY	CODE
Dominica	DM
Dominican Republic	DO
Ecuador	EC
Egypt	EG
El Salvador	SV
Equatorial Guinea	GQ
Eritrea	ER
Estonia	EE
Eswatini	SZ
Ethiopia	ET
Falkland Islands	FK
Faroe Islands	FO
Fiji	FJ
Finland	FI
France	FR
French Guiana	GF
French Polynesia	PF
French Southern Territories	TF
Gabon	GA
Gambia	GM
Georgia	GE
Germany	DE
Ghana	GH
Gibraltar	GI
Greece	GR

COUNTRY	CODE
Greenland	GL
Grenada	GD
Guadeloupe	GP
Guam	GU
Guatemala	GT
Guernsey	GG
Guinea	GN
Guinea-Bissau	GW
Guyana	GY
Haiti	HI
Heard Island and McDonald Islands	HM
Honduras	HN
Hong Kong SAR	HK
Hungary	HU
Iceland	IS
India	IN
Indonesia	ID
Iran	IR
Iraq	IQ
Ireland	IE
Isle of Man	IM
Israel	IL
Italy	IT
Jamaica	JM
Jan Mayen	XJ

COUNTRY	CODE
Japan	JP
Jersey	JE
Jordan	JO
Kazakhstan	KZ
Kenya	KE
Kiribati	KI
Korea	KR
Kosovo	XK
Kuwait	KW
Kyrgyzstan	KG
Laos	LA
Latvia	LV
Lebanon	LB
Lesotho	LS
Liberia	LR
Libya	LY
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macao SAR	MO
Madagascar	MG
Malawi	MW
Malaysia	MY
Maldives	MV
Mali	ML

COUNTRY	CODE
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mayotte	YT
Mexico	MX
Micronesia	FM
Moldova	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL
New Caledonia	NC
New Zealand	NZ
Nicaragua	NI
Niger	NE
Nigeria	NG

COUNTRY	CODE
Niue	NU
Norfolk Island	NF
North Korea	KP
North Macedonia	MK
Northern Mariana Islands	NP
Norway	NO
Oman	OM
Pakistan	PK
Palau	PW
Palestinian Authority	PS
Panama	PA
Papua New Guinea	PG
Paraguay	PY
Peru	PE
Philippines	PH
Pitcairn Islands	PN
Poland	PL
Portugal	PT
Puerto Rico	PR
Qatar	QA
Reunion	RE
Romania	RO
Russia	RU
Rwanda	RW
Saba	XS

COUNTRY	CODE
Saint Barthelemy	BL
Saint Kitts and Nevis	KN
Saint Lucia	LC
Saint Martin	MF
Saint Pierre and Miquelon	PM
Saint Vincent and the Grenadines	VC
Samoa	WS
San Marino	SM
Sao Tome and Principe	ST
Saudi Arabia	SA
Senegal	SN
Serbia	RS
Seychelles	SC
Sierra Leone	SL
Singapore	SG
Sint Eustatius	XE
Sint Maarten	SX
Slovakia	SK
Slovenia	SL
Solomon Islands	SB
Somalia	SO
South Africa	ZA
South Georgia and South Sandwich Islands	GS
South Sudan	SS
Spain	ES

COUNTRY	CODE
Sri Lanka	LK
St Helena, Ascension, Tristan da Cunha	SH
Sudan	SD
Suriname	SR
Svalbard	SJ
Sweden	SE
Switzerland	CH
Syria	SY
Taiwan	TW
Tajikistan	TJ
Tanzania	TZ
Thailand	TH
Timor-Leste	TL
Togo	TG
Tokelau	TK
Tonga	TO
Trinidad and Tobago	TT
Tunisia	TN
Turkey	TR
Turkmenistan	TM
Turks and Caicos Islands	TC
Tuvalu	TV
U.S. Outlying Islands	UM
U.S. Virgin Islands	VI
Uganda	UG

COUNTRY	CODE
Ukraine	UA
United Arab Emirates	AE
United Kingdom	GB
United States	US
Uruguay	UY
Uzbekistan	UZ
Vanuatu	VU
Vatican City	VA
Venezuela	VE
Vietnam	VN
Wallis and Futuna	WF
Yemen	YE
Zambia	ZM
Zimbabwe	ZW

PowerShell script to test Direct Routing Session Border Controller connections

4/30/2020 • 2 minutes to read • Edit Online

SIP Tester client is a sample PowerShell script that you can use to test Direct Routing Session Border Controller (SBC) connections in Microsoft Teams. This script tests basic functionality of a customer-paired Session Initiation Protocol (SIP) trunk with Direct Routing.

The script submits an SIP test to the test runner, waits for the result, and then presents it in a human-readable format. You can use this script to test the following scenarios:

- Outbound and inbound calls
- Simultaneous ring
- Media escalation
- Consultative transfer

Download the script and documentation

Download the SIP Tester client script and documentation.

> **NOTE**
> SIP Tester client script only supports adal.ps version 3.19.8.1. An error will be returned if a later version of the adal.ps is used.

Manage call notifications

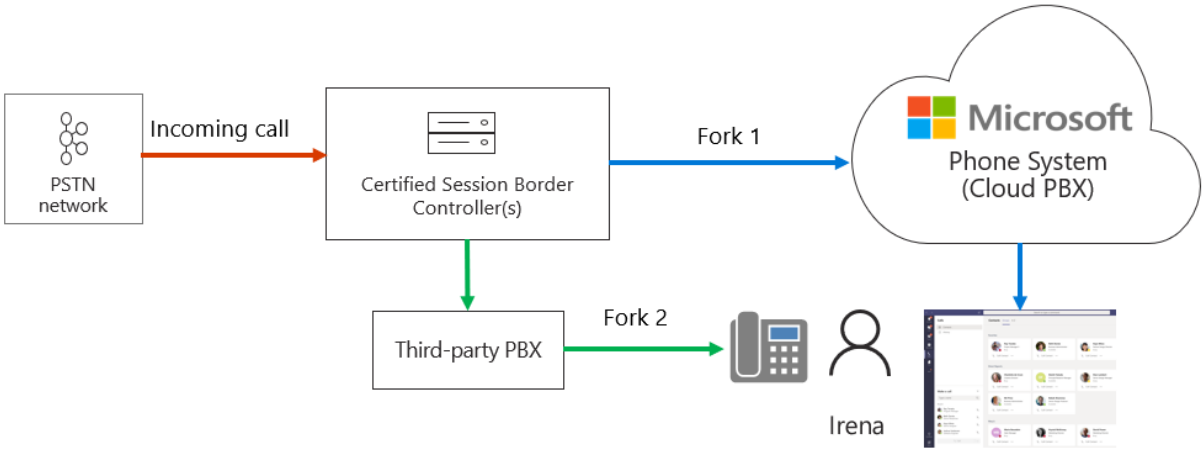
2/29/2020 • 2 minutes to read • Edit Online

This article describes how to manage call notifications for your users. You can configure call endpoints to both Teams and to a third-party Private Branch Exchange (PBX) or Session Border Controller (SBC). This is useful, for example, if you want to send a call to a user's mobile and desk phones at the same time.

In the following diagram, user Irena has two endpoints:

- A Teams endpoint
- A SIP phone connected to a third-party SBC

When a call arrives, the SBC forks the call between Phone System Direct Routing and the third-party SBC.



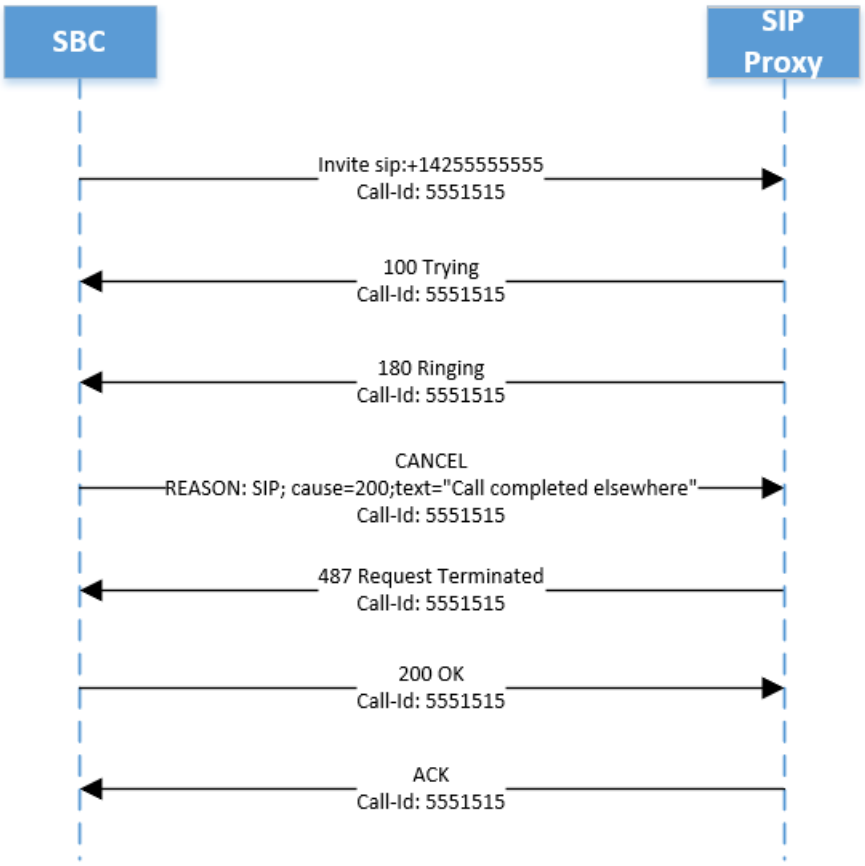
If the call is accepted on Fork 2 (by the third-party SBC), Teams will generate a "Missed Call" notification.

You can prevent the "Missed Call" notification by configuring the SBC to send a Cancel on Fork 1 as follows:

REASON: SIP; cause=200;text"Call completed elsewhere"

Note that the call will not be registered in the call detail records of Microsoft Phone System as a successful call. The call will be registered as an "Attempt" with Final SIP Code "487", Final Microsoft subcode "540200", and Final SIP Code Phrase "Call completed elsewhere". (To view the call detail records, go the Teams Admin portal, Analytics and Reports, Usage Reports, and select PSTN Usage.)

The diagram below illustrates the SIP ladder for Fork 1, explains the call flow, and the expected REASON in the Cancel message.


SBC
SIP Proxy
Invite sip:+14255555555
Call-Id: 5551515
100 Trying
Call-Id: 5551515
180 Ringing
Call-Id: 5551515
CANCEL
REASON: SIP; cause=200;text="Call completed elsewhere"
Call-Id: 5551515
487 Request Terminated
Call-Id: 5551515
200 OK
Call-Id: 5551515
ACK
Call-Id: 5551515

Direct Routing - Definitions and RFC standards

2/6/2020 • 3 minutes to read • Edit Online

This article describes how Microsoft Phone System Direct Routing implements RFC standard protocols. This article is intended for voice administrators who are responsible for configuring the connection between the on-premises Session Border Controller (SBC) and the Session Initiation Protocol (SIP) proxy service.

The customer SBC interfaces with the following components in the Microsoft Teams backend:

- **The SIP proxy** for signaling. This is the Internet-facing component of Direct Routing that handles SIP (TLS) connections between the SBCs and Direct Routing.
- **The media processors** for media. This is the Internet-facing component of Direct Routing that handles media traffic. This component uses SRTP and SRTCP protocols.

For more information about Direct Routing, see Phone System Direct Routing.

For more information about how Direct Routing implements the SIP protocol, see Direct Routing - SIP protocol.

RFC standards

Direct Routing complies with RFC standards. The SBC connected to Direct Routing must also comply with the following RFCs (or their successors).

Standards applicable to devices that support non-media bypass mode

The following standards are applicable to devices that support only non-media bypass mode:

- RFC 3261 SIP: Session Initiation Protocol
- RFC 3325. Private Extension to the Session Initiation Protocol for asserted identity within Trusted Networks--Sections about handling P-Asserted-Identity header. Direct Routing sends P-Asserted-Identity with Privacy ID headers.
- RFC 4244 An extension to Session Initiation Protocol (SIP) for required History Information. See also: Routing SIP Protocol description for more information.
- RFC 3892 The Session Initiation Protocol Referred-By mechanism
- RFC 3891 The Session Initiation Protocol (SIP) "Replaces" Header
- RFC 6337 Session Initiation Protocol (SIP) Usage of the Offer/Answer Model. See the “Deviations from RFC” section.
- RFC 3711 and RFC 4771. Protect RTP traffic using SRTP. The SBC must be able to establish keys using SDES.
- RFC 8035 Session Description Protocol (SDP) Offer/Answer Clarifications for RTP/RTCP Multiplexing

Standards applicable to devices that support media bypass mode

In addition to the standards listed as applicable to non-bypass mode, the following standards are used for media bypass mode:

- RFC 5245 Interactive Connectivity Establishment (ICE) for media bypass. The SBC must support the following:
  - ICE Lite - the Teams clients are full ICE clients
  - ICE Restarts. See more on ICE restarts use case and examples in ICE Restart: Media bypass call transferred to an endpoint which does not support media bypass
- RFC RFC 5589 Session Initiation Protocol (SIP) Call Control – Transfer.
- RFC 3960 Early Media and Ringing Tone Generation in the Session Initiation Protocol (SIP), see sections 3.1, Forking, and 3.2, Ringing Tone Generation

- RFC 5389 Session Traversal Utilities for NAT (STUN)
- RFC 5766 Traversal Using Relays around NAT (TURN): Relay Extensions to Session Traversal Utilities for NAT (STUN)

Standards applicable to support conveying location information to E911 providers

- RFC 6442, Location Conveyance for the Session Initiation Protocol

Deviations from the RFC's

The following table lists the sections of the RFC(s) in which Microsoft's implementation of the SIP or media stack deviates from the standard:

RFC AND SECTIONS	DESCRIPTION	DEVIATION
RFC 6337, section 5.3 Hold and Resume of Media	RFC allows using "a=inactive", "a=sendonly", a=recvonly" to place a call on hold.	The SIP proxy only supports "a=inactive" and does not understand if the SBC sends "a=sendonly" or "a=recvonly".
RFC 6337, section 5.4 "Behavior on Receiving SDP with c=0.0.0.0	RFC3264 requires that an agent is capable of receiving SDP with a connection address of 0.0.0.0, in which case it means that neither RTP nor RTCP should be sent to the peer.	The SIP proxy does not support this option.

Operational modes

There are two operational modes for Direct Routing:

- **Without media bypass** in which all RTP traffic flows between the Teams client, the media processors, and the SBC.
- **With media bypass** in which all RTP media flows between the Teams endpoints and the SBC.

Note that SIP traffic always flows via the SIP proxy.

Direct Routing - SIP protocol

6/23/2020 • 16 minutes to read • Edit Online

This article describes how Direct Routing implements the Session Initiation Protocol (SIP). To properly route traffic between a Session Border Controller (SBC) and the SIP proxy, some SIP parameters must have specific values. This article is intended for voice administrators who are responsible for configuring the connection between the on-premises SBC and the SIP proxy service.

Processing the incoming request: finding the tenant and user

On an incoming call, the SIP proxy needs to find the tenant to which the call is destined and find the specific user within this tenant. The tenant administrator might configure non-DID numbers, for example +1001, in multiple tenants. Therefore, it is important to find the specific tenant on which to perform the number lookup because the non-DID numbers might be the same in multiple Microsoft 365 or Office 365 organizations.

This section describes how the SIP proxy finds the tenant and the user, and performs authentication of the SBC on the incoming connection.

The following is an example of the SIP Invite message on an incoming call:

PARAMETER NAME	EXAMPLE OF THE VALUE
Request-URI	INVITE sip:+18338006777@sip.pstnhub.microsoft.com SIP /2.0
Via Header	Via: SIP/2.0/TLS sbc1.adatum.biz:5058;alias;branch=z9hG4bKac2121518978
Max-Forwards header	Max-Forwards:68
From Header	From Header From: <sip:7168712781@sbc1.adatum.biz;transport=udp;tag=1c74 7237679
To Header	To: sip:+183338006777@sbc1.adatum.biz
CSeq header	CSeq: 1 INVITE
Contact Header	Contact: <sip: 68712781@sbc1.adatum.biz:5058;transport=tls>

On receiving the invite, the SIP proxy performs the following steps:

1. Check the certificate. On the initial connection, the Direct Routing service takes the FQDN name presented in the Contact header and matches it to the Common Name or Subject Alternative name of the presented certificate. The SBC name must match one of the following options:
   - Option 1. The full FQDN name presented in the Contact header must match the Common Name/Subject Alternative name of the presented certificate.
   - Option 2. The domain portion of the FQDN name presented in the Contact header (for example adatum.biz of the FQDN name sbc1.adatum.biz) must match the wildcard value in Common

Name/Subject Alternative Name (for example *.adatum.biz).

2. Try to find a tenant using the full FQDN name presented in the Contact header.

   Check if the FQDN name from the Contact header (sbc1.adatum.biz) is registered as a DNS name in any Microsoft 365 or Office 365 organization. If found, the lookup of the user is performed in the tenant that has the SBC FQDN registered as a Domain name. If not found, Step 3 applies.

3. Step 3 only applies if Step 2 failed.

   Remove the host portion from the FQDN, presented in the Contact header (FQDN: sbc12.adatum.biz, after removing the host portion: adatum.biz), and check if this name is registered as a DNS name in any Microsoft 365 or Office 365 organization. If found, the user lookup is performed in this tenant. If not found, the call fails.

4. Using the phone number presented in the Request-URI, perform the reverse number lookup within the tenant found in Step 2 or 3. Match the presented phone number to a user SIP URI within the tenant found on the previous step.

5. Apply trunk settings. Find the parameters set by the tenant admin for this SBC.

   Microsoft does not support having a third-party SIP proxy or User Agent Server between the Microsoft SIP proxy and the paired SBC, which might modify the Request URI created by the paired SBC.

   The requirements for the two lookups (steps 2 and 3) needed for the scenario where one SBC is interconnected to many tenants (carrier scenario) are covered later in this article.

Detailed requirements for Contact header and Request-URI

Contact header

For all incoming calls to the Microsoft SIP proxy, the Contact header must have the paired SBC FQDN in the URI hostname as follows:

Syntax: Contact: <sip:phone or sip address@FQDN of the SBC;transport=tls>

This name must also be in the Common Name or Subject Alternative name field(s) of the presented certificate. Microsoft supports using wildcard values of the name(s) in the Common Name or Subject Alternative Name fields of the certificate.

The support for wildcards is described in RFC 2818, section 3.1. Specifically:

*"Names may contain the wildcard character * which is considered to match any single domain name component or component fragment. E.g., *.a.com matches foo.a.com but not bar.foo.a.com. f*.com matches foo.com but not bar.com."*

If more than one value in the Contact header presented in a SIP message is sent by the SBC, only the FQDN portion of the first value of the Contact header is used.

Request-URI

For all incoming calls, the Request-URI is used to match the phone number to a user.

Currently The phone number must contain a plus sign (+) as shown in the following example.

```
INVITE sip:+18338006777@sip.pstnhub.microsoft.com SIP /2.0
```

Contact and Record-Route headers considerations

The SIP proxy needs to calculate the next hop FQDN for new in-dialog client transactions (for example Bye or Re-Invite), and when replying to SIP Options. Either Contact or Record-Route are used.

According to RFC 3261, Contact header is required in any request that can result in a new dialog. The Record-Route is only required if a proxy wants to stay on the path of future requests in a dialog. If a proxy SBC is in use with Local Media Optimization for Direct Routing, a record route will need to be configured as the proxy SBC needs to stay in the route.

Microsoft recommends using only Contact header if a proxy SBC is not used:

- Per RFC 3261, Record-Route is used if a proxy wants to stay on the path of future requests in a dialog, which is not essential if no proxy SBC is configured as all traffic goes between the Microsoft SIP proxy and the paired SBC.
- The Microsoft SIP proxy uses only Contact header (not Record-Route) to determine the next hop when sending outbound ping Options. Configuring only one parameter (Contact) instead of two (Contact and Record-Route) simplifies the administration if a proxy SBC is not in use.

To calculate the next hop, the SIP proxy uses:

- Priority 1. Top-level Record-Route. If the top-level Record-Route contains the FQDN name or IP, the FQDN name or IP is used to make the outbound in-dialog connection.
- Priority 2. Contact header. If Record-Route does not exist, the SIP proxy will look up the value of the Contact header to make the outbound connection. (This is the recommended configuration.)

If both Contact and Record-Route are used, the SBC administrator must keep their values identical, which causes administrative overhead.

Use of FQDN name in Contact or Record-Route

Use of an IP address is not supported in either Record-Route or Contact. The only supported option is an FQDN, which must match either the Common Name or Subject Alternative Name of the SBC certificate (wildcard values in the certificate are supported).

- If an IP address is presented in Record-route or Contact, the certificate check fails and the call fails.
- If the FQDN does not match the value of the Common or Subject Alternative Name in the presented certificate, the call fails.

Inbound call: SIP dialog description

The following table below summarizes the call flow differences and similarities between non-bypass and bypass modes:

PARAMETER NAME	NON-BYPASS MODE	BYPASS MODE
Media candidates in 183 and 200 messages coming from	Media processors	Clients
Number of 183 messages SBC can receive	One per session	Multiple
Call can be with provisional answer (183)	Yes	Yes
Call can be without provisional answer (183)	Yes	Yes

Non-media bypass flow

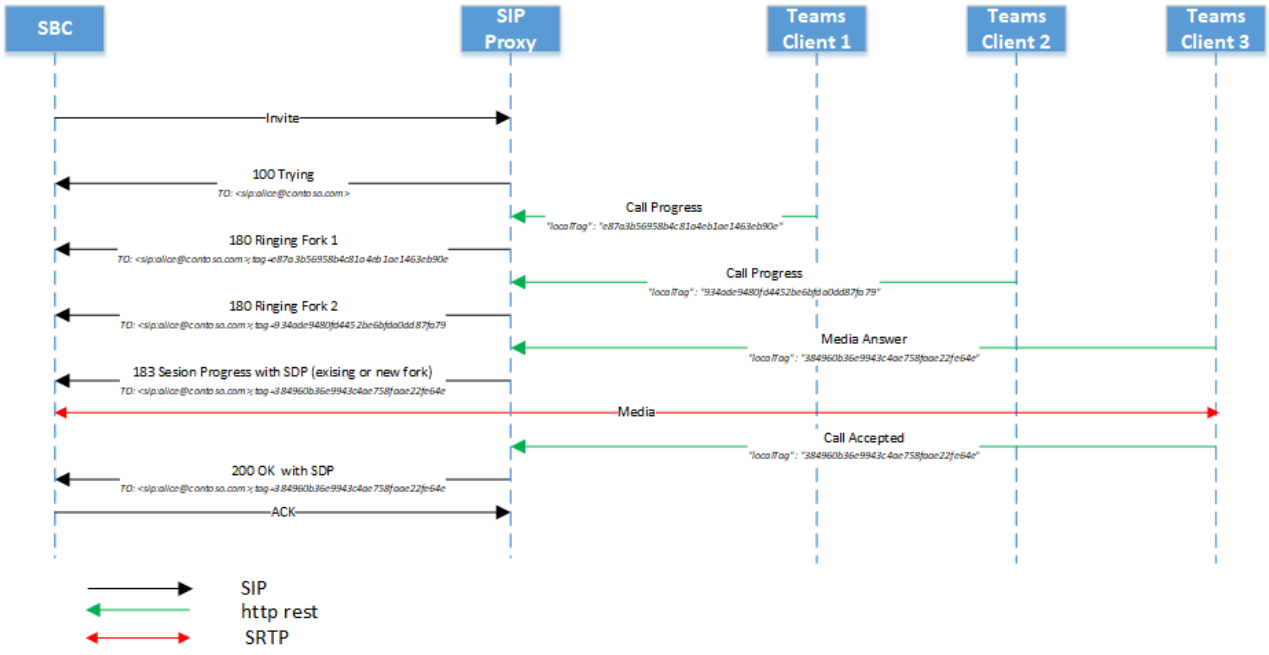
A Teams user might have multiple endpoints at the same time. For example, Teams for Windows client, Teams for

iPhone client, and Teams Phone (Teams Android client). Each endpoint might signal an HTTP rest as follows:

- Call progress – converted by the SIP proxy to the SIP message 180. On receiving message 180, the SBC must generate local ringing.
- Media answer – converted by the SIP proxy to message 183 with media candidates in Session Description Protocol (SDP). On receiving message 183, the SBC expects to connect to the media candidates received in the SDP message. Note that in some cases the Media answer might not be generated, and the end point might answer with "Call Accepted" message.
- Call accepted – converted by the SIP proxy to SIP message 200 with SDP. On receiving message 200, the SBC is expected to send and receive media to and from the provided SDP candidates.

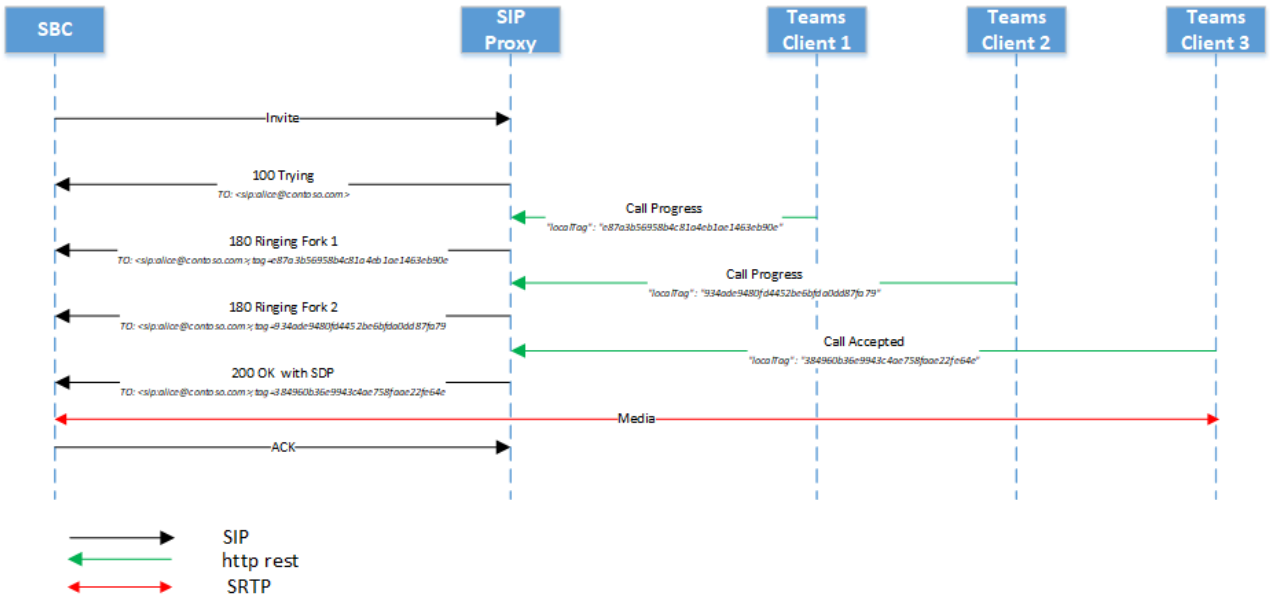
Multiple endpoints ringing with provisional answer

1. On receiving the first Invite from the SBC, the SIP proxy sends the message "SIP SIP/2.0 100 Trying" and notifies all end user endpoints about the incoming call.
2. Upon notification, each endpoint will start ringing and sending "Call progress" messages to the SIP proxy. Because a Teams user can have multiple end points, the SIP proxy might receive multiple Call Progress messages.
3. For every Call Progress message received from the clients, the SIP proxy converts the Call Progress message to the SIP message "SIP SIP/2.0 180 Trying". The interval for sending such messages is defined by the interval of the receiving messages from the Call Controller. In the following diagram, there are two 180 messages generated by the SIP proxy. These messages come from the two Teams endpoints of the user. The clients each have a unique Tag ID. Every message coming from a different endpoint will be a separate session (the parameter "tag" in the "To" field will be different). But an endpoint might not generate message 180 and send message 183 right away as shown in the following diagram.
4. Once an endpoint generates a Media Answer message with the IP addresses of endpoint's media candidates, the SIP proxy converts the message received to a "SIP 183 Session Progress" message with the SDP from the client replaced by the SDP from the Media Processor. In the following diagram, the endpoint from Fork 2 answered the call. If the trunk is non-bypassed, the 183 SIP message is generated only once (either Ring Bot or Client End Point). The 183 might come on an existing fork or start a new one.
5. A Call Acceptance message is sent with the final candidates of the endpoint that accepted the call. The Call Acceptance message is converted to SIP message 200.



Multiple endpoints ringing without provisional answer

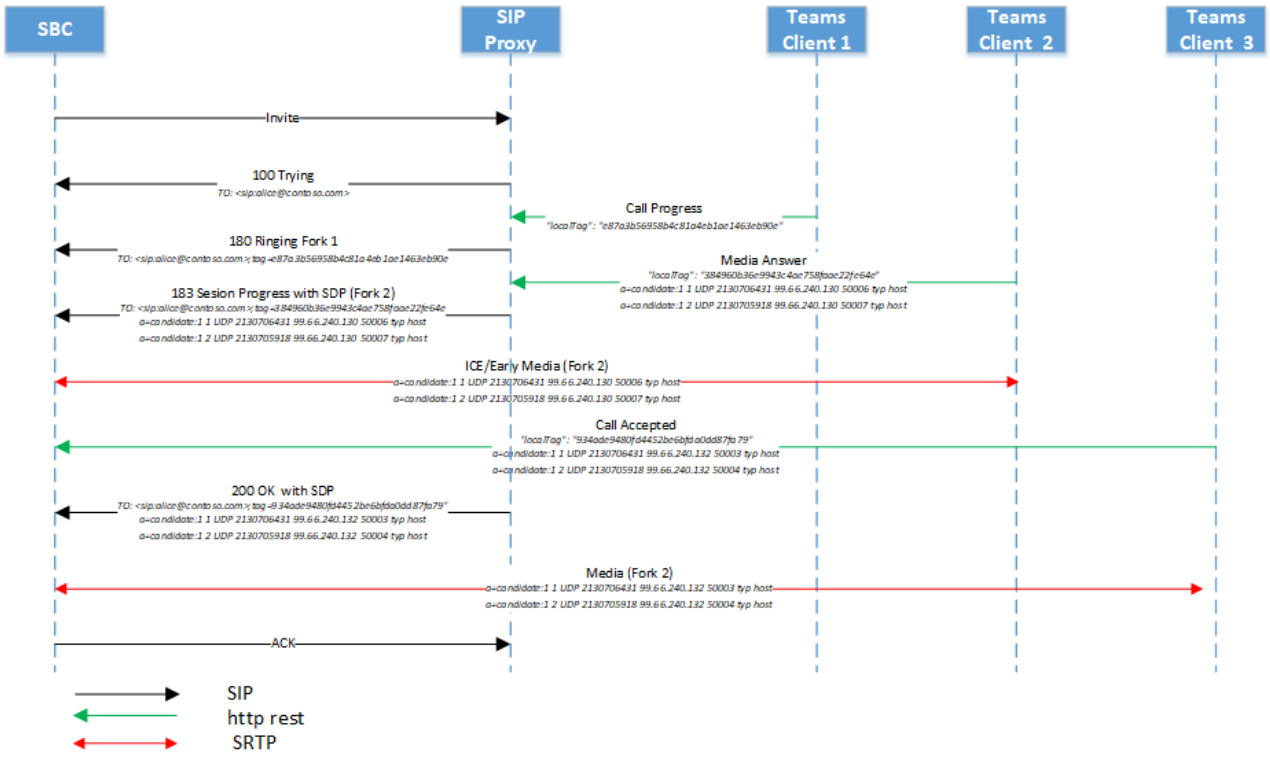
1. On receiving the first Invite from the SBC, the SIP proxy sends the message "SIP SIP/2.0 100 Trying" and notifies all end user endpoints about the incoming call.
2. Upon notification, each endpoint will start ringing and sending the message "Call progress" to the SIP proxy. Because a Teams user can have multiple end points, the SIP proxy might receive multiple Call Progress messages.
3. For every Call Progress message received from the clients, the SIP proxy converts the Call Progress message to the SIP message "SIP SIP/2.0 180 Trying". The interval for sending the messages is defined by the interval of receiving the messages from the Call Controller. On the picture below there are two 180 messages generated by the SIP proxy, meaning that user logged into three Teams clients and each client send the call progress. Every message will be a separate session (parameter "tag" in "To" field is different)
4. A Call Acceptance message is sent with the final candidates of the endpoint that accepted the call. The Call Acceptance message is converted to SIP message 200.



Media bypass flow

The same messages (100 Trying, 180, 183) are used in the media bypass scenario.

The schema below shows an example of the bypass call flow. Note that the media candidates can come from different endpoints.



Replaces option

The SBC must support Invite with Replaces.

Size of SDP considerations

The Direct Routing interface might send a SIP message exceeding 1,500 bytes. The size of SDP primarily causes this. However, if there is a UDP trunk behind the SBC, it might reject the message if it is forwarded from the Microsoft SIP proxy to the trunk unmodified. Microsoft recommends stripping some values in SDP on the SBC when sending the message to the UDP trunks. For example, the ICE candidates or unused codecs can be removed.

Call transfer

Direct Routing supports two methods for call transfer:

- Option 1. SIP proxy processes Refer from the client locally and acts as a Referee as described in section 7.1 of RFC 3892.

  With this option, the SIP proxy terminates the transfer and adds a new Invite.

- Option 2. SIP proxy sends the Refer to the SBC and acts as a Transferor as describing in Section 6 of RFC 5589.

  With this option, the SIP proxy sends a Refer to the SBC and expects the SBC to handle the Transfer fully.

The SIP proxy selects the method based on the capabilities reported by the SBC. If the SBC indicates that it supports the method "Refer", the SIP proxy will use Option 2 for call transfers.

The following is an example of an SBC sending the message that the Refer method is supported:

```
ALLOW: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY
```

If the SBC doesn't indicate that Refer as a supported method, Direct Routing will use Option 1 (SIP proxy acts as a Referee) . The SBC must also signal that it supports the Notify method:

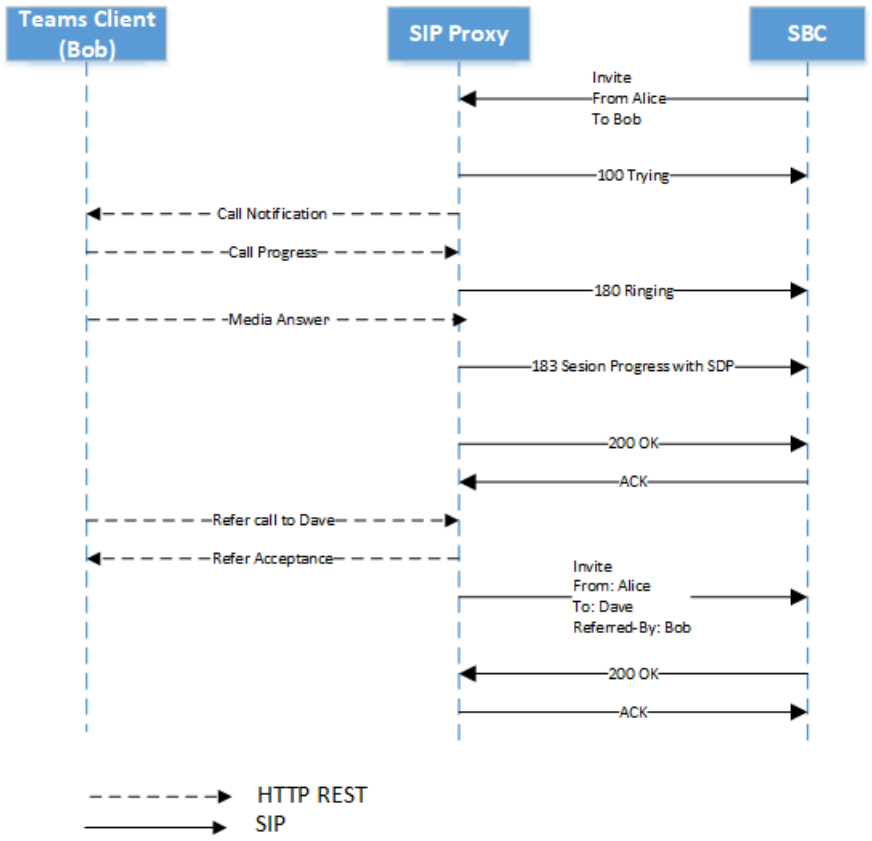
Example of SBC indicating that Refer method is not supported:

```
ALLOW: INVITE, ACK, CANCEL, BYE, INFO, NOTIFY, PRACK, UPDATE, OPTIONS
```

SIP proxy processes Refer from the client locally and acts as a Referee

If the SBC indicated that the Refer method is not supported, the SIP proxy acts as a Referee.

The Refer request that comes from the client will be terminated on the SIP proxy. (The Refer request from the client is shown as "Call transfer to Dave" in the following diagram. For more information, see section 7.1 of RFC 3892.



SIP proxy send the Refer to the SBC and acts as a Transferor

This is the preferred method for call transfers, and it is mandatory for devices seeking media bypass certification. Call Transfer without the SBC being able to handle Refer is not supported in media bypass mode.

The standard is explained in Section 6 of RFC 5589. The related RFCs are:

- Session Initiation Protocol (SIP) Call Control - Transfer
- Session Initiation Protocol (SIP) "Replaces" Header
- Session Initiation Protocol (SIP) "Referred-By" mechanism

This option assumes that the SIP proxy acts as a Transferor and sends a Refer message to the SBC. The SBC acts as a Transferee and handles the Refer to generate a new offer for transfer. There are two possible cases:

- The call is transferred to an external PSTN participant.
- The call is transferred from one Teams user to another Teams user in the same tenant via the SBC.

If the call is transferred from one Teams user to another via the SBC, the SBC is expected to issue a new invite (start a new dialog) for the transfer target (the Teams user) using the information received in the Refer message.

To populate the To/Transferor fields for the transaction of the request internally, the SIP proxy needs to convey this information inside the REFER-TO/REFERRED-BY headers.

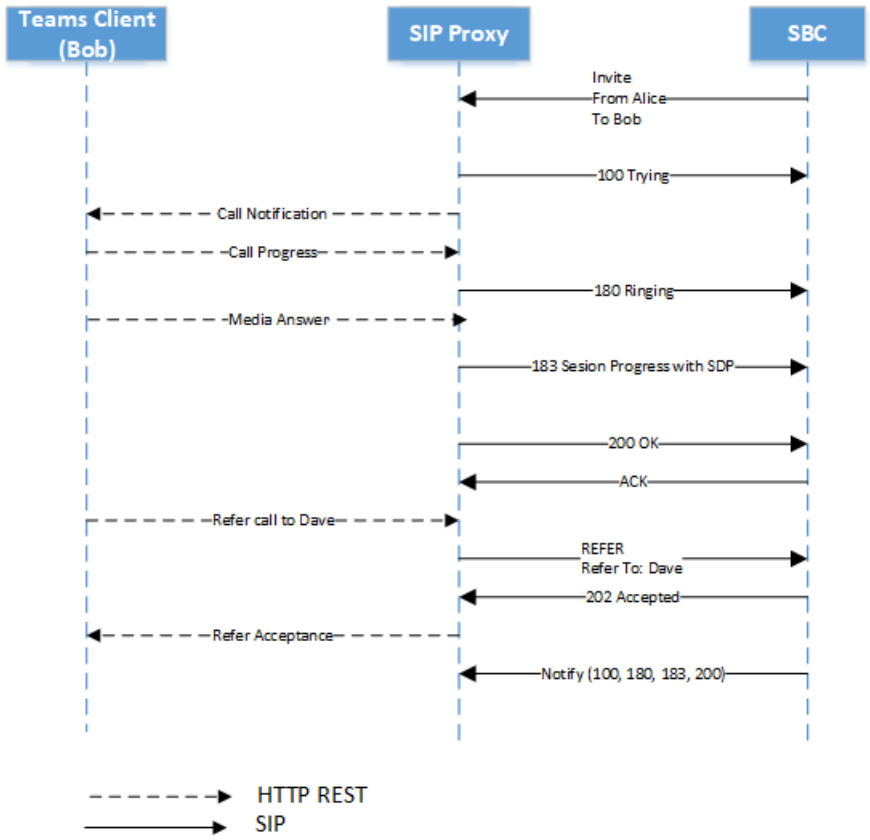
The SIP proxy will form the REFER-TO as a SIP URI comprised of a SIP proxy FQDN in the hostname and either one of the following:

- An E.164 phone number in the username part of the URI in case the transfer target is a phone number, or
- x-m and x-t parameters encoding the full transfer target MRI and tenant ID respectively

The REFERRED-BY header is a SIP URI with transferor MRI encoded in it as well as transferor tenant ID and other transfer context parameters as shown in the following table:

PARAMETER	VALUE	DESCRIPTION
x-m	MRI	Full MRI of transferor/transfer target as populated by CC
x-t	Tenant ID	x-t Tenant ID Optional Tenant Id as populated by CC
x-ti	Transferor Correlation Id	Correlation Id of the call to the transferor
x-tt	Transfer target call URI	Encoded call replacement URI

The size of the Refer Header can be up to 400 symbols in this case. The SBC must support handling Refer messages with size up to 400 symbols.



Session timer

The SIP proxy supports (always offers) the Session Timer on non-bypass calls but does not offer it on bypass calls. Use of the Session Timer by the SBC is not mandatory.

Use of Request-URI parameter user=phone

The SIP proxy analyses the Request-URI and if the parameter user=phone is present, the service will handle the Request-URI as a phone number, matching the number to a user. If parameter is not present the SIP proxy applies heuristics to determine the Request-URI user type (phone number or a SIP address).

Microsof recommends always applying the user=phone parameter to simplify the call setup process.

History-Info header

The History-Info header is used for retargeting SIP requests and "provide(s) a standard mechanism for capturing the request history information to enable a wide variety of services for networks and end-users." For more information, see RFC 4244 – Section 1.1. For Microsoft Phone System, this header is used in Simulring and Call Forwarding scenarios.

If sending, the History-Info is enabled as follows:

- The SIP proxy will insert a parameter containing the associated phone number in individual History-Info entries that comprise the History-Info header sent to the PSTN Controller. Using only entries that have the phone number parameter, the PSTN Controller will rebuild a new History-Info header, and pass it on to the SIP trunk provider via SIP proxy.
- History-Info header will be added for simultaneous ring and call forwarding cases.
- History-Info header will not be added for call transfer cases.
- An individual history entry in the reconstructed History-Info header will have the phone number parameter provided combined with the Direct Routing FQDN (sip.pstnhub.microsoft.com) set as the host part of the URI; a parameter of 'user=phone' will be added as part of the SIP URI. Any other parameters associated with the original History-Info header, except for phone context parameters, will be passed through in the re-constructed History-Info header. Note that entries that are private (as determined by the mechanisms defined in Section 3.3 of RFC 4244) will be forwarded as is because the SIP trunk provider is a trusted peer.
- Inbound History-Info is ignored.

Following is the format of the History-info header sent by the SIP proxy:

```
<sip:UserB@sip.pstnhub.microsoft.com?Privacy=history&Reason=SIP%3B\cause%3D486>;index=1.2,
```

If the call was redirected several times, information about every redirect is included with the appropriate reason in chronological order.

Header Example:

```
History-info:
<sip:+14257123456@sip.pstnhub.microsoft.com;user=phone?Reason=SIP;cause=302;text="Move Temporarily">;index=1
<sip:+14257123457@sip.pstnhub.microsoft.com;user=phone?Reason=SIP;cause=496;text="User Busy">;index=1.1
```

The History-Info is protected by a mandatory TLS mechanism.

SBC connection to Direct Routing and failover mechanism

See the section Failover mechanism for SIP signaling in Plan for Direct Routing.

Retry-After

If a Direct Routing datacenter is busy, the service can send a Retry-After message with a one-second interval to the SBC. When the SBC receives a 503 message with a Retry-After header in response to an INVITE, the SBC must

terminate that connection and try the next available Microsoft datacenter.

ICE Restart: Media bypass call transferred to an endpoint that does not support media bypass

The SBC must support ICE restarts as described in RFC 5245, section 9.1.1.1.

The restart in Direct Routing is implemented according to the following paragraphs of the RFC:

To restart ICE, an agent MUST change both the ice-pwd and the ice-ufrag for the media stream in an offer. Note that it is permissible to use a session-level attribute in one offer, but to provide the same ice-pwd or ice-ufrag as a media-level attribute in a subsequent offer. This is not a change in password, just a change in its representation, and does not cause an ICE restart.

An agent sets the rest of the fields in the SDP for this media stream as it would in an initial offer of this media stream (see Section 4.3). Consequently, the set of candidates MAY include some, none, or all of the previous candidates for that stream and MAY include a totally new set of candidates gathered as described in Section 4.1.1.

If the call was initially established with media bypass, and the call is transferred to a Skype for Business client, Direct Routing needs to insert a Media Processor--this is because Direct Routing cannot be used with a Skype for Business client with media bypass. Direct Routing starts the ICE restart process by changing the ice-pwd and ice-ufrag and offering new media candidates in a reinvite.

Overview

2/10/2020 • 6 minutes to read • Edit Online

This article describes how Direct Routing supports media bypass with a Session Border Controller (SBC) enabled for ICE Lite as described in RFC 5245. This article is intended for voice administrators who are responsible for configuring the connection between the on-premises SBC and the SIP proxy service.

This article provides an overview of the ICE Lite scenarios and requirements for interoperability. The article describes the message formats and the required state machine transitions for ensuring reliable call and media flow.

Terminology

- First Hello – The first words spoken by the caller and callee. It is important that all efforts are made to ensure that the first packets from the endpoints are delivered reliably for most use cases.
- Forking – The offer from the caller might be delivered to multiple callee endpoints if the callee is available on multiple devices (for example, a Teams user might be signed into Teams for Windows and Teams for Android or iPhone).
- Provisional Answer (183) – The callee endpoints for faster call setup send an answer with the candidates and keys required to establish media flow. This is done in anticipation of the user potentially answering the call(200OK) from that specific callee instance. With forking, the caller should be ready to receive multiple provisional answers.
- Re-Invite – Offer with final candidates selected by the ICE controlling endpoint. This will have the a=remote-candidate attribute to resolve any race conditions from handling multiple forks.
- Teams Endpoint – This could either be a server (Media Processor, Transport Relay) or the Teams client.

Message format

The Teams infrastructure follows RFC 5245 for ICE-Lite. This implies that all the STUN messages will be compliant with RFC 5389.

The SBCs as required by RFC 5389 must ignore any STUN attributes that they do not recognize, and continue to process the messages with the known attributes.

If any malformed packets are received, the packets must be discarded without impacting the media session establishment.

ICE Lite requirements

This section briefly captures the requirements for ICE Lite.

Candidate gathering

The SBC must offer only one candidate that is publicly reachable. Currently, only IPV4 candidates are supported.

Connectivity checks

The ICE Lite implementation must respond to any connectivity checks received. The ICE Lite endpoint must not send any connectivity check requests. (If connectivity checks are sent in violation, the full implementation will respond, which can result in unexpected peer-derived candidates being discovered and potentially result in call failures.)

Nominations

The ICE full implementation endpoint will always be the Controlling endpoint, and will follow "Regular" nominations for selecting the final candidates to be used for media flow. The ICE Lite endpoint can use the nominations to conclude the path to be used for media and complete call establishment.

Note: In the case of forking with peer endpoints sending 183 provisional answers, the SBC must be ready to respond to checks from multiple endpoints and also nominations from multiple endpoints if the nominations happen before 200OK. Depending on the convergence of the ICE state machine on the final path and timing of the user answering, the nominations can happen before or after 200OK. The SBC must be able to handle both cases.

Converging for forking

If the offer from the SBC forks to multiple Teams endpoints, the Teams endpoints may respond with a provisional answer and start connectivity checks. The SBC must be prepared to receive connectivity checks and respond to connectivity checks from multiple peer endpoints. For example, the Teams user could be signed on to both a desktop and a cell phone. Both devices will be notified of the inbound call and will attempt connectivity checks with the SBC.

Eventually only one of the endpoints will answer the call (200OK). On receiving the 200OK, the SBC can set up the right context for processing the media packets.

Scenarios

Inbound call from SBC

For this scenario, there are several possible peer endpoints that the SBC must handle:

- Server endpoints will typically respond directly with 200OK. These are full ICE endpoints that are typically involved in Voicemail, Call queue, and Auto attendant scenarios.
- Client endpoints can send multiple provisional answers with different From/To tags (183) followed by a 200OK from the endpoint that answers the call. These are full ICE endpoints typically representing end user clients.
- Other SBC endpoints. These are ICE Lite endpoints typically involved in the scenario of simultaneously ringing client endpoints and another phone number(s).

The SBC must respond to all valid connectivity check requests received from the full ICE endpoints. Per RFC, the full ICE endpoints will become Controlling endpoints. The Teams (client/server) endpoints will perform "Regular" nominations to complete connectivity checks. The final 200Ok can either be from an endpoint that sent early media or from a different endpoint. On receiving the 200Ok, the SBC must set up the right context for media flow.

Early media

If there is early media flow, the SBC must latch to the first endpoint that starts streaming media; media flow can start before candidates are nominated. The SBC should have support for sending DTMF during this phase to enable IVR/voicemail scenarios. The SBC should use the highest priority path on which it has received checks if nominations have not completed.

Outbound call to SBC

The Teams endpoints are the Caller for this scenario and will be the Controlling Endpoint. On receiving either a provisional answer (183) or a final answer(200OK), the Teams endpoint will start connectivity checks and proceed to "Regular" nominations to complete the connectivity checks.

Note: If the SBC sends a provisional answer (183), the SBC must be ready to receive connectivity check requests and potentially complete the nominations before the 200OK is sent by the SBC. If checks and/or nominations are completed before the 200OK is received, checks and/or nominations will not be performed again after 200OK is received. The SBC must not change ICE candidates, password, and ufrag (username fragment) between 183 and 200.

To support early media, the SBC may start streaming the media to the peer ICE candidate, with the highest priority based on received connectivity checks, even before nominations are completed by Teams endpoint. The SBC should expect media from Teams on any candidate until nominations are completed. Once a candidate is nominated, the SBC must reset to the right context to send and receive media packets.

SRTP support requirements

The SBC must support SRTP encryption cipher AES_CM_128_HMAC_SHA1_80 for offer and answer in the following format:

```
"inline:" <key||salt> ["|" lifetime]
```

The following is an example of the crypto attribute in the SDP offer from the SBC:

```
a=crypto:1 AES_CM_128_HMAC_SHA1_80 inline:V/Lr6Lsvhad/crSB9kCQ28jrYDxR2Yfk5bXryH5V|2^31
```

MKI and Length parameters are not required.

For more information, see RFC 4568, section 6.1.

SDES support requirements

The device must be able to offer SDES in the format as described below. Microsoft Media Processors always prefer SDES.

- With non-media bypass, even if a client only supports DTLS, the Media Processors will convert to SDES.
- With media bypass, if a client is DTLS only (future Google Chrome state), Direct Routing will insert an MP in the path, converting the call from media bypass to non-media bypass. Between the SBC and media processor component of Direct Routing, SDES is always used.

Currently, there are no Teams client that offer only DTLS; however Google has announced that at some point in time they will stop supporting SDES.

Format for offer from SBC in bypass mode

Offer must contain SDES and can contain DTLS optional in the following format:

```
m=audio 54056 UDP/TLS/RTP/SAVP 0 8 76 77 18 9 101 13
a=rtcp:54056
a=crypto:1 AES_CM_128_HMAC_SHA1_80 inline:krXco0QRglwErMqtbMs2zSw29tBdmdgXpEYZhQmp|2^31
a=fingerprint:sha-256
AE:24:07:15:5C:B7:45:1A:E4:45:60:C1:1E:68:0E:CC:8D:A6:78:3B:76:65:BB:B0:77:88:07:F8:98:18:62:34
a=setup:actpass
a=rtcp-mux
```

Format for answer containing SDES to SBC

```
m=audio 54056 RTP/SAVP 111 103 104 9 0 8 description 106 13 110 112 113 126
a=rtcp:54056
a=crypto:2 AES_CM_128_HMAC_SHA1_80 inline:fBc61ikv1kMy0sF85DblNqTzVAbFa7hJQ9GKb6Yj|2^31|1:1
a=crypto:3 AES_CM_128_HMAC_SHA1_80 inline:O1qT9tWbs/NwJVwhfrgF5tCrbNOxnVDqkIqTx4rz|2^31
a=rtcp-mux
```

Format for offer from Teams to SBC

Format for SDES only offer to SBC

```
m=audio 52884 RTP/SAVP 111 103 104 9 0 8 106 13 110 112 113 126
a=crypto:0 AES_CM_128_HMAC_SHA1_32 inline:Hr4D2cgUu9+Uza5Igz/JkVx59DAxDbaxJg862ibQ|2^31
a=crypto:1 AES_CM_128_HMAC_SHA1_80 inline:JPEaIxHegfuv53ykBPZk8hV0GO8kTiiqRMfHimEE|2^31
a=rtcp:52884
a=rtcp-mux
```

Manage voice routing policies in Microsoft Teams

9/22/2020 • 2 minutes to read • Edit Online

If you've deployed Phone System Direct Routing in your organization, you use voice routing policies to allow Teams and Skype for Business Online users to receive and make phone calls to the Public Switched Telephone Network (PSTN) using your on-premises telephony infrastructure.

A voice routing policy is a container for PSTN usage records. You create and manage voice routing policies by going to **Voice** > **Voice routing policies** in the Microsoft Teams admin center or by using Windows PowerShell.

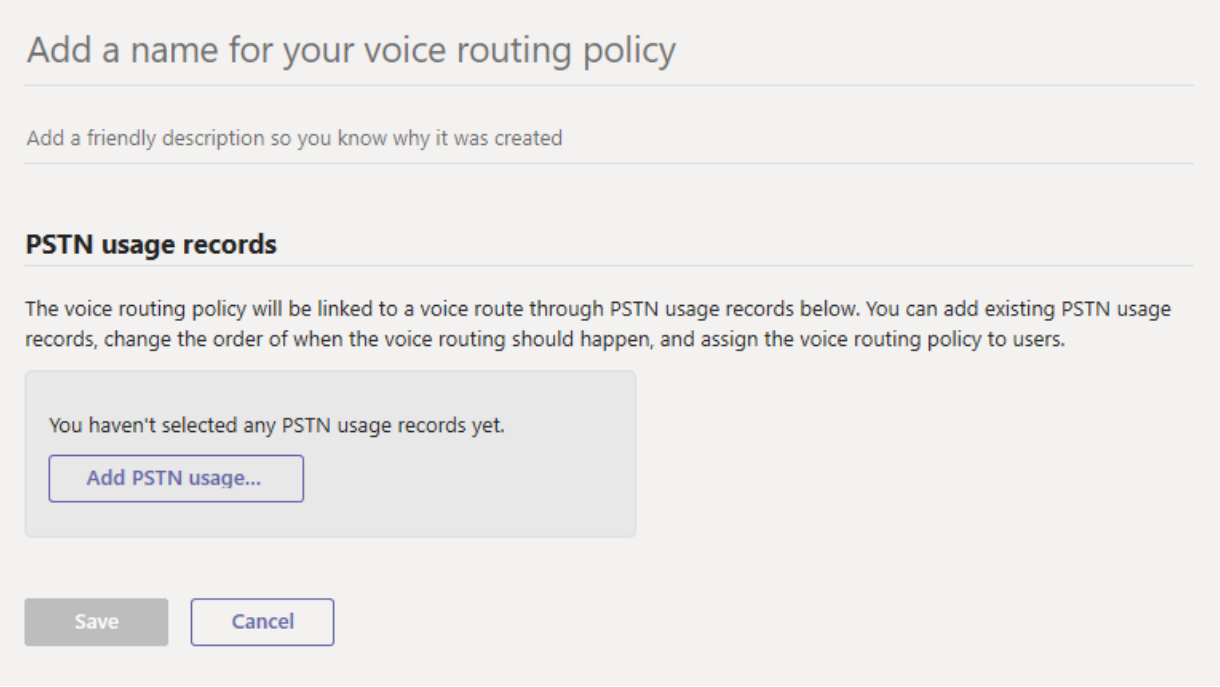
You can use the global (Org-wide default) policy or create and assign custom policies. Users will automatically get the global policy unless you create and assign a custom policy. Keep in mind that you can edit the settings in the global policy but you can't rename or delete it.

It's important to know that assigning a voice routing policy to a user doesn't enable them to make PSTN calls in Teams. You'll also need to enable the user for Phone System Direct Routing and complete other configuration steps. To learn more, see Configure Direct Routing.

Create a custom voice routing policy

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Voice routing policies**, and then click **Add**.



2. Enter a name and description for the policy.
3. Under **PSTN usage records**, click **Add PSTN usage**, and then select the records that you want to add. If you need to create a new PSTN usage record, click **Add**.
4. If you added multiple PSTN usage records, arrange them in the order that you want.
5. When you're done, click **Apply**.
6. Click **Save**.

Using PowerShell

See New-CsOnlineVoiceRoutingPolicy.

Edit a voice routing policy

Using the Microsoft Teams admin center

You can edit the global policy or any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Voice routing policies**.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. Click **Add/remove PSTN usage records**, make the changes that you want, and then click **Save**.

Using PowerShell

See Set-CsOnlineVoiceRoutingPolicy.

Assign a custom voice routing policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

See also Grant-CsOnlineVoiceRoutingPolicy.

Related topics

Teams PowerShell overview

Configure voice routing for Direct Routing

Enable Location-Based Routing for Direct Routing

Assign policies to your users in Teams

Manage phone numbers for your organization

12/5/2020 • 2 minutes to read • Edit Online

There are four ways to get user (subscriber) and service (toll and toll-free) phone numbers for your organization:

- Getting new user phone numbers in the Microsoft Teams admin center.
- Getting new service phone numbers in the Microsoft Teams Admin Center.
- Transfer or *Port* your existing phone numbers with us.
- Use a request form for new phone numbers that aren't listed in the Microsoft Teams admin center.

> **IMPORTANT**
>
> For new phone numbers in Australia, see Telstra Voice Services. For new phone numbers in Japan, see SoftBank Voice Services.

If you know what kind of forms you are looking for, use the drop-down to select the country/region where you're getting numbers.

Select your country or region to find the downloadable PDF LOA forms you will need

Here's a bit more information about these number request forms

Request forms for new phone numbers

Each country or region has different instructions, different types of phone numbers (geographic/non-geographic and service (toll/toll-free)) and rules/regulations for getting phone numbers so they can be used in Microsoft Teams.

Sometimes (depending on your country or region) you won't be able to get new user (subscriber) or service (toll or toll-free) phone numbers using the Microsoft Teams admin center or you might need *specific* phone numbers (vanity requests) or *specific* area codes.

If so, you will need to download the correct PDF LOA form (per country or region and type of phone numbers) and send it back to us. Our service desk will take it from there and start processing your request.

Letters of Authorization (LOAs) to transfer/port existing phone numbers from another service provider to Microsoft Teams

If you need to transfer/port your existing phone numbers, you will need to download, fill and send us a Letter of Authorization (LOA), which gives us permission to request and transfer, on your behalf, those existing numbers from a different service provider into Microsoft Teams.

Please send us an **LOA** if you currently have the following with another carrier:

- User (subscriber) numbers.
- Service (toll) numbers for audio conferencing bridges, auto attendants, or call queues.
- Toll-Free phone numbers.
- More than 999 user phone numbers that you need to transfer/port but can't get in the Microsoft

Teams admin center using the local number porting wizard.

Once you have your **filled and signed** LOA, please contact our PSTN Service Desk so we can assist you.

Still need assistance?

Please contact our PSTN Service Desk and we will assist you as soon as possible.

Additional resources

- To see *if* and which calling plans are available in your country or region, read Countries and region availability for Audio Conferencing and Calling Plans
- To assist you in choosing the correct type of phone numbers, read Different kinds of phone numbers used for Calling Plans.
- To get assistance with setting up phone numbers for your organization, read: Support Contact for Business Products - Admin Help.

Related topics

Emergency calling terms and conditions

Emergency Calling disclaimer label

Different kinds of phone numbers used for Calling Plans

4/27/2020 • 2 minutes to read • Edit Online

Microsoft Teams uses different telephone number types depending on the purpose for which you want to use the phone number. Teams uses **user** numbers, which can be assigned to users in your organization, and **service** numbers, which are assigned to services such as Audio Conferencing, auto attendants, or call queues. Service phone numbers have a *higher concurrent call capacity* than user numbers. Service phone numbers are available but will vary by country/region and the type of number (whether it's a toll or toll-free number). If you need additional or other number types other than those numbers seen in the Microsoft Teams admin center, you can submit a phone number request to the PSTN service desk help.

- **User numbers**

  User numbers are assigned to users, and there are two kinds:

  - **Geographic numbers** Geographic numbers have a relationship to a geographic area and are the most common. For example, geographic phone numbers in most cases can only be used within a certain address, city, state, or region of the country.
  - **Non-geographic numbers** Non-geographic numbers are national numbers that don't have a relationship to a geographic area within a country/region. For example, non-geographic numbers often have the same cost when calling the number from anywhere within the country/region. Also, some countries, such as Denmark, only have non-geographic numbers available.

- **Service numbers** Service numbers are available in several different number types, and availability does vary by country/region.

  - **Toll service numbers**

    Toll service numbers may incur a toll cost to the caller, and there are two kinds:

    - **Geographic numbers** Geographic numbers have a relationship to a geographic area. For example, geographic phone numbers in most cases can only be used within a certain address, city, state, or region of the country.
    - **Non-geographic numbers** Non-geographic numbers are national numbers that don't have a relationship to a geographic area within a country/region. For example, non-geographic numbers often have the same cost when calling the number from anywhere within the country/region.

  - **Toll-free service numbers** These service numbers don't typically incur a toll cost to the caller. Teams provides national toll-free numbers in over 60 countries/regions.

    Caution

    Some countries/regions and originating number types, such as calls originating from mobile phones, may in some cases incur a toll cost to the caller.

> **NOTE**
>
> If you need to get more phone numbers than this, contact the PSTN service desk.

Related topics

Transferring phone numbers common questions

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Getting phone numbers for your users

12/5/2020 • 3 minutes to read • Edit Online

Before you can set up users in your organization to make and receive phone calls, you must get phone numbers for them.

There are three ways to get user numbers:

- **Use the Microsoft Teams admin center.** For some countries and regions, you can get numbers for your users using the Microsoft Teams admin center. See Get new phone numbers for your users.
- **Port your existing numbers.** You can port or transfer existing numbers from your current service provider or phone carrier. See Transfer phone numbers to Teams or Manage phone numbers for your organization for more information to help you do this.
- **Use a request form for new numbers.** Sometimes (depending on your country or region) you won't be able to get your new phone numbers using the Microsoft Teams Admin Center or you'll need specific phone numbers or area codes. See Manage phone numbers for your organization for more information.

> **NOTE**
> If you need help setting up phone numbers for your organization, please [contact Support Contact for Business Products - Admin Help(https://docs.microsoft.com/microsoft-365/admin/contact-support-for-business-products?view=o365-worldwide&tabs=online.

Get new phone numbers for your users

Using the Microsoft Teams admin center

You must be a Teams service admin to make these changes. See Use Teams administrator roles to manage Teams to read about getting admin roles and permissions.

1. Go to the Microsoft Teams Admin Center.
2. In the left navigation, go to **Voice** > **Phone numbers**, and then click **Add**.
3. Enter a name for the order and add a description.
4. On the Location and quantity page, do the following:
   a. Under **Country or region**, select a country or region.
   b. Under **Number type**, select **User (subscriber)**.
   c. Under **Location**, select a location. If you need to create a new location, click **Add a location**.
   d. Under **Area code**, select an area code.
   e. Under **Quantity**, enter the number of numbers that you want for your organization, and then click **Next** to select your numbers.
5. Select the numbers you want. You have 10 minutes to select your phone numbers and place your order. If you take more than 10 minutes, the phone numbers will be returned to the pool of numbers.
6. When you're ready to place your order, click **Place order**.

IMPORTANT

The number of phone numbers for users (subscribers) is equal to the total number of **Domestic Calling Plan** and/or **Domestic and International Calling Plan** licenses you have assigned multiplied by 1.1, plus 10 additional phone numbers. For example, if you have 50 users in total with a Domestic Calling Plan and/or Domestic and International Calling Plan, you can acquire **65** phone numbers **(50 x 1.1 + 10)**. For details, see How many phone numbers can you get?. If you need to get more phone numbers than this, contact Support Contact for Business Products - Admin Help.

Port or transfer phone numbers from your service provider or phone carrier

- If you need 999 or fewer phone numbers for your users, use the porting wizard in the Microsoft Teams Admin Center. Follow the steps in Transfer phone numbers to Teams. If your country or region isn't listed in the porting wizard, you can manually submit a port order or see Manage phone numbers for your organization to download the correct Letter of Authorization (LOA).
- If you need to port more than 999 phone numbers, you can manually submit a port order or see Manage phone numbers for your organization to download the correct Letter of Authorization (LOA) and then send it to the PSTN service desk to get all your numbers transferred.

View the phone numbers for your organization

Using the Microsoft Teams admin center

In the left navigation of the admin center, go to **Voice** > **Phone numbers** to view the numbers for your organization, including location, number type, and status information.

Assign phone numbers to users

After you get your phone numbers, you'll need to assign a number to each of your users. See Assign, change, or remove a phone number for a user for more information.

NOTE

If you need to get more phone numbers than this, contact Support Contact for Business Products - Admin Help.

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

How many phone numbers can you get?

4/3/2020 • 3 minutes to read • Edit Online

When you are looking for and getting phone numbers for your organization, you can get more phone numbers than you have assigned licenses. But this depends on the types of phone numbers and types of licenses you have bought and assigned. You can click Different kinds of phone numbers used for Calling Plans to find out about the different phone numbers that are used in Microsoft Teams.

You can see the number of phone numbers you can get on the **Get phone numbers** page in the Microsoft Teams admin center, or you can run the Get-CsOnlineTelephoneNumberAvailableCount cmdlet.

> **IMPORTANT**
> The limits below don't include phone numbers you have ported or transferred to Microsoft.

How many phone numbers you can get?

Here's the type of phone number	How do you get the total phone numbers?	Here's an example
User (subscriber) number	The number of phone numbers is equal to the total number of **Domestic Calling Plan** and/or **Domestic and International Calling Plan** licenses multiplied by 1.1 + 10 additional phone numbers.	If I have 50 users in total with either a Domestic Calling Plan and/or Domestic and International Calling Plan, you can acquire **65** phone number **(50 x 1.1 + 10)**.

Toll service number	The number of phone numbers is equal to the total number of **Phone System** and **Audio Conferencing** licenses and uses the following: If there are **1-25 licenses** then **5** telephone numbers are given. If there are **26-49 licenses** then **10** telephone numbers are given. If there are **50-99 licenses** then **20** telephone numbers are given. If there are **100-149 licenses** then **30** telephone numbers are given. If there are **150-199 licenses** then **40** telephone numbers are given. If there are **200-499 licenses** then **65** telephone numbers are given. If there are **500-749 licenses** then **90** telephone numbers are given. If there are **750-999 licenses** then **110** telephone numbers are given. If there are **1,000-1,249 licenses** then **125** telephone numbers are given. If there are **1,250-1,499 licenses** then **135** telephone numbers are given. If there are **1,500-1,999 licenses** then **160** telephone numbers are given. If there are **2,000-2,999 licenses** then **210** telephone numbers are given. If there are **3,000-6,999 licenses** then **420** telephone numbers are given. If there are **7,000-9,999 licenses** then **500** telephone numbers are given. If there are **10,000-14,999 licenses** then **600** telephone numbers are given. If there are **15,000-19,999 licenses** then **700** telephone numbers are given. If there are **20,000-49,999 licenses** then **1000** telephone numbers are given. If there are **50,000+ licenses** then **1500** telephone numbers are given.	If you have a total of **51 Phone System** and **Audio Conferencing** licenses, you can get **20** toll service numbers.

Toll-free service number	The number of phone numbers is equal to the total number of **Phone System** and **Audio Conferencing** licenses and uses the following: If there are **1-25 licenses** then **5** telephone numbers are given. If there are **26-49 licenses** then **10** telephone numbers are given. If there are **50-99 licenses** then **20** telephone numbers are given. If there are **100-149 licenses** then **30** telephone numbers are given. If there are **150-199 licenses** then **40** telephone numbers are given. If there are **200-499 licenses** then **65** telephone numbers are given. If there are **500-749 licenses** then **90** telephone numbers are given. If there are **750-999 licenses** then **110** telephone numbers are given. If there are **1,000-1,249 licenses** then **125** telephone numbers are given. If there are **1,250-1,499 licenses** then **135** telephone numbers are given. If there are **1,500-1,999 licenses** then **160** telephone numbers are given. If there are **2,000-2,999 licenses** then **210** telephone numbers are given. If there are **3,000-6,999 licenses** then **420** telephone numbers are given. If there are **7,000-9,999 licenses** then **500** telephone numbers are given. If there are **10,000-14,999 licenses** then **600** telephone numbers are given. If there are **15,000-19,999 licenses** then **700** telephone numbers are given. If there are **20,000-49,999 licenses** then **1000** telephone numbers are given. If there are **50,000+ licenses** then **1500** telephone numbers are given.	If you have a total of **1001 Phone System** and **Audio Conferencing** licenses, you can get **125** toll-free service numbers. **Important:** Communications Credits billing is required to reserve and use toll-free phone numbers.

NOTE

If you need to get more telephone numbers than this, please contact support for business products - Admin Help

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Search for phone numbers for users

2/6/2020 • 2 minutes to read • Edit Online

When you are setting up users in your organization to make and receive phone calls, you must use the **Microsoft Teams admin center** and first get phone numbers that can be assigned to users. The phone number you assign to a user will be a phone number that you have chosen for your organization and will be listed in the drop-down list when you edit the properties of the user and click **Assign**.

Before you can assign phone numbers to your users, you must use the **Get new numbers** page to search for numbers that are available for you within an area. You can search by **Country or region**, **Number type**, and **Location**, and then enter the number of phone numbers you will need for your users.

If you need some help with getting phone numbers, you can see Manage phone numbers for your organization or Contact support for business products - Admin Help

Search for phone numbers

To search for phone numbers for your users

Using the Microsoft Teams admin center

1. Go to the **Microsoft Teams admin center**.
2. In the left navigation select **Voice** > **Phone numbers** > **Get new numbers**.

   > **IMPORTANT**
   > For you to see the **Voice** option in the left navigation in the Microsoft Teams admin center, you must first buy at least one **Enterprise E5 license**, one **Phone System** add-on license, or one **Audio Conferencing** add-on license.

3. On the **Select location and quantity** page, select a location from the **Country or region** drop-down list.
4. Select a number type from the **Number type** drop-down list.
5. In the **Location** box, type the name of the city where the user is located, and then select the location from the list. Click **Add a location** if the location you want doesn't appear on the list.
6. Select the area code for the location.
7. Under **Quantity**, enter the number of phone numbers that you want for your organization, and then click **Next**. You have 10 minutes to select your phone numbers. If you take more than 10 minutes, the numbers will be returned to the pool of phone numbers.

   > **NOTE**
   > You can see the number of phone numbers available to you (which is based on the number of licenses), listed next to **Quantity**.

8. On the **Get numbers** page, select the phone numbers you want, click **Acquire numbers**, and then click **Next**.

IMPORTANT

You can acquire more phone numbers than you have licenses. To determine how many phone numbers you can acquire, take your number of licenses, add 10 percent of the number of licenses, and then add 10. For example, if you have 100 **Domestic Calling Plan** and/or **International Calling Plan** licenses, you can reserve 120 phone numbers, assuming that you have not already acquired some phone numbers for those 100 users. For more details, see How many phone numbers can you get?

9. On the **Confirmation** page, verify your choices, and then click **Place order**.
10. When you return to the **Phone numbers** page, select the phone number or numbers that you want to assign and then click **Edit** to assign it to a user.

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

See a list of phone numbers in your organization

6/10/2020 • 2 minutes to read • Edit Online

There are different types of phone numbers that you can assign to users or other services (service numbers), such as for Audio Conferencing in Microsoft 365 or Office 365.

To see a list of all phone numbers that you have for your organization

Using the Microsoft Teams admin center

1. Go to the **Microsoft Teams admin center**.
2. In the left navigation, go to **Voice** > **Phone numbers**.

   > **IMPORTANT**
   > For you to see the **Voice** option in the left navigation in the Skype for Business admin center, you must first buy at least one **Enterprise E5 license**, one **Phone System** add-on license, or one **Audio Conferencing** add-on license.

3. To view the phone numbers that are assigned, see the **Status** column.
4. To filter your view, click the filter icon. On the **Filter** pane, you can use the drop-down list to filter your view by:
   - **Number range** that you set. You can search by lowest number or highest number.
   - Numbers that start with a number that you specify.
   - Number **activation state**.
   - Number **type**.
   - Phone number **status**.

To see all of the phone numbers that are assigned to users

When you are setting up users, you might just want to see the list of the phone numbers that are already assigned to users and which phone numbers are available to be assigned to them.

Using the Microsoft Teams admin center

1. Go to the **Microsoft Teams admin center**.
2. In the left navigation, go to **Voice** > **Phone numbers**.

   > **IMPORTANT**
   > For you to see the **Voice** option in the left navigation in the Microsoft Teams admin center, you must first buy at least one **Enterprise E5 license**, one **Phone System** add-on license, or one **Audio Conferencing** add-on license.

3. To quickly sort the numbers so that you can see which are assigned, click the **Status** column heading. Or, you can click the filter icon and then filter your view to see phone numbers that are already assigned to users or unassigned numbers that you can assign to a user. You can filter by:

- **Assigned to user**
- **Assigned to conference bridge**
- **Unassigned**

To see the phone numbers that are assigned to voice users

When you are setting up users in your organization to make and receive phone calls, you must first get the phone numbers and then assign them to your users. After you've gotten your phone numbers, you might just want to see the activation status of the number assignments.

Using the Microsoft Teams admin center !

1. Go to the **Microsoft Teams admin center**.
2. In the left navigation, go to **Voice** > **Phone numbers**.

   > **IMPORTANT**
   > For you to see the **Voice** option in the left navigation in the Microsoft Teams admin center, you must first buy at least one **Enterprise E5 license**, one **Phone System** add-on license, or one **Audio Conferencing** add-on license.

3. Click the filter icon to filter your view by **Activation state** You can filter by:
   - **Activated**
   - **Assignment pending**
   - **Assignment failed**
   - **Update pending**
   - **Update failed**

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

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Emergency calling terms and conditions

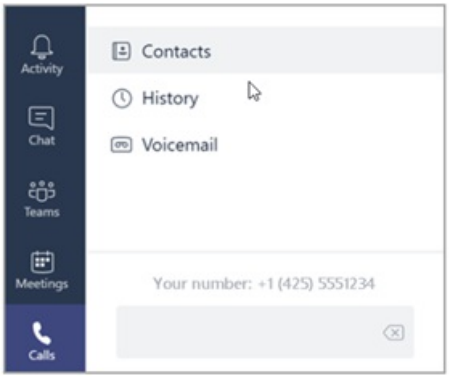
Emergency Calling disclaimer label

Get-CsOnlineTelephoneNumber

Assign, change, or remove a phone number for a user

8/17/2020 • 2 minutes to read • Edit Online

When you set up Calling Plans, you assign phone numbers to your users. In Microsoft Teams, the phone number you assign is listed when a user clicks **Calls**.



When you're setting up users so they can make and receive phone calls, you must first use the Microsoft Teams admin center and assign a phone number. You can change or remove the phone number if you need to.

To learn how to get Calling Plans in Teams and how much they cost, see Teams add-on licensing.

> **NOTE**
> One way to see whether a user has a license assigned is by going to the Microsoft Teams admin center > **Users**. If a license is assigned, it will be indicated on the page. You can also use the Microsoft 365 admin center.

Assign a phone number to a user

Using the Microsoft Teams admin center

1. In the left navigation, click **Voice** > **Phone numbers**.
2. On the **Phone numbers** page, select an unassigned number in the list, and then click **Edit**.
3. In the **Edit** pane, under **Assigned to**, search for the user by display name or user name, and then click **Assign**.
4. To assign or change the associated emergency location, under **Emergency location**, search for and then select the location.
5. Depending on whether you want to send an email to the user with their phone number information, turn off or turn on **Email user with telephone number information**. By default, this is on.
6. Click **Save**.

> **NOTE**
> Because of the latency between Microsoft 365 or Office 365 and Teams, it can take up to 24 hours for users to be enabled. If the phone number isn't assigned correctly after 24 hours, contact support for business products - Admin Help. We're here to help!

Change a phone number for a user

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, locate and double-click the user you want, click **Account**, and then under **General information**, make a note of the phone number that's assigned to the user.
2. In the left navigation, click **Voice** > **Phone numbers**.
3. On the **Phone numbers** page, select the number that you identified in step 1, and then click **Edit**.
4. In the **Edit** pane, under **Assigned to**, click the **X** to remove the user.
5. Click **Save**.
6. On the **Phone numbers** page, select an unassigned number in the list, and then click **Edit**.
7. In the **Edit** pane, under **Assigned to**, search for the user by display name or user name, and then click **Assign**.
8. To assign or change the associated emergency location, under **Emergency location**, search for and then select the location.
9. Click **Save**.

Remove a phone number from a user

Using the Microsoft Teams admin center

1. In the left navigation, click **Users**, locate and double-click the user you want, click **Account**, and then under **General information**, make a note of the phone number that's assigned to the user.
2. In the left navigation, click **Voice** > **Phone numbers**.
3. On the **Phone numbers** page, select the number that you identified in step 2, and then click **Edit**.
4. In the **Edit** pane, under **Assigned to**, click the **X** to remove the user.
5. Click **Save**.

Related topics

What is address validation?

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Getting service phone numbers

12/5/2020 • 3 minutes to read • Edit Online

In addition to getting phone numbers for your users, you can get toll or toll-free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants, and call queues (also called service numbers). Service phone numbers have a higher concurrent calling capacity than user or subscriber phone numbers. For example, a service number can handle hundreds of calls simultaneously, whereas a user's phone number can only handle a few calls simultaneously.

> **NOTE**
>
> You have to first set up Communications Credits before you can get toll-free numbers. To learn more, see Set up Communications Credits for your organization.

There are three ways to get service numbers:

- **Use the Microsoft Teams admin center.** For some countries and regions, you can get service numbers using the Microsoft Teams admin center. See Get new service numbers.
- **Port your existing numbers.** You can port or transfer existing numbers from your current service provider or phone carrier. See Transfer phone numbers to Teams or Manage phone numbers for your organization for more information to help you do this.
- **Use a request form for new numbers.** Sometimes (depending on your country or region) you won't be able to get your new phone numbers using the Microsoft Teams admin center, or you'll need specific phone numbers or area codes. If so, you'll need to download a form and send it back to us. See Manage phone numbers for your organization for more information.

> **NOTE**
>
> Service numbers are needed so you can get a higher concurrent call capacity for a specific number. When you're transferring the number over to us, you can contact the PSTN service desk to make sure the service number you're transferring has a high concurrent call capacity.

Get new service numbers

Using the Microsoft Teams admin center

1. In the left navigation, go to **Voice** > **Phone numbers**, and then click **Add**.
2. Enter a name for the order and add a description.
3. On the Location and quantity page, do the following:
   a. Under **Country or region**, select a country or region.
   b. Under **Number type**, select the type of service number that you want.
   c. Under **Location**, select a location. If you need to create a new location, click **Add a location**.
   d. Under **Area code**, select an area code.
   e. Under **Quantity**, enter the number of numbers that you want for your organization, and then click **Next** to select your numbers.
4. Select the numbers you want. You have 10 minutes to select your phone numbers and place your order. If you

take more than 10 minutes, the phone numbers will be returned to the pool of numbers.

5. When you're ready to place your order, click **Place order**.

Port or transfer existing service numbers

To transfer your phone numbers from your current service provider or carrier to Teams, you can use the porting wizard in the Microsoft Teams admin center. Follow the steps in Transfer phone numbers to Teams.

If your country or region isn't listed in the porting wizard, you can manually submit a port order or go to Manage phone numbers for your organization, select your country or region, and then download a Letter of Authorization (LOA). You'll have to submit separate port orders for each type of service number (for example, toll vs. toll-free) that you'll be transferring by using an LOA. In the LOA, you must select the correct type of service number. Make sure you specify that you're transferring a service number (and not a user or subscriber number), or the concurrent calling capacity may not be enough to handle call volumes.

> **NOTE**
> If you need to get more phone numbers than this, contact the PSTN service desk.

View the phone numbers for your organization



Using the Microsoft Teams admin center

In the left navigation, go to **Voice** > **Phone numbers** to view the numbers for your organization, including location, number type, and status information.

Assign service phone numbers

After you get your service numbers, assign each number to an Audio Conferencing bridge. See Change the toll or toll free numbers on your Audio Conferencing bridge.

Related topics

Here's what you get with Phone System

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Country and region availability for Audio Conferencing and Calling Plans

What's a port order?

9/4/2020 • 7 minutes to read • Edit Online

If you currently have a phone service provider or carrier and already have phone numbers for your users or services, you need to create a "*port order*" to transfer those phone numbers to Microsoft Teams. When the numbers are ported over, you can assign those phone numbers to your users and services such as audio conferencing (for conference bridges), auto attendants, and call queues.

After you port your phone numbers over to Teams, Microsoft becomes your service provider and you can disconnect your service with your old service provider or carrier.

Review the information in this article to get familiar with number porting. After that, you should be ready to create a port order and transfer your phone numbers. See Transfer phone numbers to Teams for step-by-step instructions.

What countries or regions support number porting?

You can port or transfer phone numbers in all the supported countries or regions, but how you submit a port order request depend on the country or region where the phone numbers come from. For a list of countries and regions that support number porting, see Manage phone numbers for your organization.

Currently, the porting wizard in the Microsoft Teams admin center supports getting phone numbers for the United Kingdom, United States, and Canada. To get phone numbers for other countries and regions, you can manually submit a port order.

What numbers can be transferred?

You can transfer

In general, you can transfer any phone number that's from a supported provider, including:

- Land line phone numbers.
- Mobile device phone numbers such as those used for cell phone and tablets.

  > **NOTE**
  > Transferring mobile numbers is only available in the United States and Puerto Rico.

- Toll phone numbers.
- Toll-free phone numbers.

  > **NOTE**
  > Universal International Freephone Number (UIFN) can't be transferred to us.

- Service phone numbers such as those used for conference bridges, auto attendants, etc.
- Fax phone numbers, but they can't be used for faxing. They have to be assigned to a user.
- VoIP phone numbers from a phone provider such as Vonage or RingCentral.

- Skype for Business hybrid phone numbers. If you want to transfer these numbers, email us at ptn@microsoft.com.

  You can't transfer:

  > **NOTE**
  > At this time, you can't transfer any phone number or numbers that aren't from a supported country or region, including phone numbers from a VoIP phone provider. For a list of supported countries/regions, see Country and region availability for Audio Conferencing and Calling Plans

- Phone numbers used for data connections like for DSL lines or broadband Internet connections.
- Phone numbers dedicated to faxing.

  If you have existing dedicated phone numbers that are being used for faxing, you *can* transfer these numbers over to Teams but your fax services won't continue to work as expected. Faxing services aren't available to Teams customers, even if you have licenses for Phone System, Domestic Calling Plan, or International Calling Plan.

  If you port the phone number to Teams, you can assign this phone number to a user in your organization instead of using it for faxing.

  > **NOTE**
  > At this time in the United Kingdom, we currently don't support transferring UK non-geographic numbers including shared cost numbers for area codes 0843, 0844, 0845, 0870, 0871, 0872.

What information do I need to provide?

You need to have all the account information for your current carrier. The information that you enter in the port order is mostly found on the most recent bill or invoice from your current service provider. You also need to know whose name is on the account and what numbers you want to port.

What are full-port and partial-port transfers?

When you're porting phone numbers to Teams, you have the option to transfer all your numbers or some of them.

- **Full-port** This is when you transfer all of your numbers from your current service provider to Teams. When you're asked for the phone numbers you want to transfer, you *must include* the billing telephone number (BTN) along with all of the other phone numbers on your account.

  For example, let's say your BTN is *+1 425-555-1234* and you want to port all of your 25 phone numbers (*+1 425-555-1235 through 1259*). When you follow the instructions below to transfer your numbers, you would enter: **+14255551234 - +14255551259**.

- **Partial-port** This is when you're only transferring some of your phone numbers from your current service provider to Teams. When you want to port some of the phone numbers tied to the same BTN, you ** *must not include* ** the BTN along with all of the other phone numbers on your account.

  For example, let's say your BTN is *+1 425-555-1234* and you want to port only 5 of your 25 phone numbers (*+1 425-555-1235 through 1259*). When you follow the instructions below to transfer your numbers, you would enter: **+1 425 555 1235 - +1 425 555 1239**.

Can I submit a single number porting request for all of my numbers at

one time?

A unique request is needed for each carrier and type of number being ported.

For example, you need to submit a unique number porting request for each of the following types of numbers:

- Local toll numbers, also known as subscriber numbers or geographic numbers
- Toll Free numbers with area codes such as: 800, 844, 855, 866, 877 and 888
- Mobile numbers
- Service numbers that can be used for Audio Conferencing in Microsoft 365 or Office 365.

Here's more information about how to submit number porting requests for each of these types of numbers:

- **Phone numbers** provided by different carriers require a unique porting request for numbers with each carrier.
- **Toll-free numbers** with area codes such as: 800, 844, 855, 866, 877 and 888 can't be included in a number porting request with other types of numbers. To port these toll-free numbers, you must manually submit a port order. You can't port these numbers in the Microsoft Teams admin center. For more information, see Manage phone numbers for your organization.

  It's important to use the correct Letter of Authorization (LOA) for the country and type of phone numbers that you want to port. You can download the LOA that you need here.
- **Mobile numbers** require a PIN code to authorize the transfer. Therefore, they need separate number porting request.
- **Service number** porting requests need to be submitted by themselves. They can't be submitted with other types of numbers.

How long does it take to port numbers?

After you've completed the port order request, it takes between 7-14 days to be processed. However, depending on your service provider it may take up to 30 days. After the phone numbers are ported over, you'll get an email from us to let you that you're good to go.

To check the status of your port order, in the left navigation of the Microsoft Teams admin center, go to **Voice** > **Phone numbers**, and then click **Order history**. Each port order status is listed in the **Status** column.

Can user (subscriber) phone numbers be converted to service numbers?

Yes they can. All you need to do is submit a service request that includes your organization's tenant GUID and the phone numbers you want converted. To do this, see Manage phone numbers for your organization.

Can I port out my numbers from Teams to a different phone service provider or carrier?

To port out your numbers from Teams to a different carrier, you must submit a request with the new carrier. You'll also need to set a porting PIN in the Microsoft Teams admin center.

To define your porting PIN, in the left navigation of the Microsoft Teams admin center, go to **Voice** > **Phone numbers**, on the upper-right corner of the page, select **Manage porting PIN**, and then enter a 10-digit PIN.

When your new carrier contacts us with the porting request, we'll ask them to provide the PIN you defined.

Common mistakes to watch out for

Number porting is easy to do. Your order can get messed up, however, if there's a problem with the phone service provider, the order is incomplete and missing information, or there are typos.

Here are the most common mistakes we see customers make when they port numbers. Save yourself a call to customer support and double-check for these errors.

- Make sure the account information you give matches exactly what your phone carrier has on record. Mismatched information is the most common cause of errors and delay your port order. Verify the following is true:
  - Name or person authorized to make changes to the account is correct.
  - Address is correct.
  - Account number is correct.
  - BTN is correct.
- Make sure there are no advanced call control features, for example, Call Hunt, Distinctive Ring, that are enabled on these phone numbers.
- Make sure you haven't placed any new service orders or disconnects with your current service provider.
- Make sure all numbers are from the same carrier and the same account.
- Make sure your service is active. Freezing the account prevents the change of carriers on the account. The person authorized to make changes to the account must submit an order to the current carrier to remove the freeze. This process can take one to three weeks depending on the carrier.

Related topics

- What's the status of your port orders?
- Different kinds of phone numbers used for Calling Plans
- Manage phone numbers for your organization
- Emergency calling terms and conditions
- Emergency Calling disclaimer label

Transfer phone numbers to Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

This is a preview or early release feature.

Use the porting wizard in the Microsoft Teams admin center to transfer your phone numbers from your current service provider to Teams. After you port your phone numbers to Teams, Microsoft will become your service provider and will bill you for those phone numbers.

Before you start, we recommend that you review the information in What's a port order? If you have service numbers for dial-in conferencing bridges, auto attendants or other service numbers, toll-free phone numbers, or have more than 999 user (subscriber) phone numbers that you need to transfer to Teams, see Manage phone numbers for your organization to download the correct forms and send them to us.

> **NOTE**
> We process port orders for transferring phone numbers only on United States business days and not on public holidays or weekends.

Create a port order and transfer your phone numbers to Teams

> **NOTE**
> **Currently, you can use this wizard to get phone numbers for the United Kingdom, United States, and Canada**. To get phone numbers for other countries and regions, you can manually submit a port order. To get the form you need to manually submit a port order, select your country or region in the drop-down list in Manage phone numbers for your organization.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Phone numbers**. Click **Numbers**, and then click **Port** to start the porting wizard.
2. Review the information on the **Get started** page, and then when you're ready, click **Next**.
3. On the **Select location and number type** page, specify the following, and then click **Next**:
   - **Country or region**: Country or region where you're getting numbers.
   - **Phone number type**: Type of number, such as geographic or toll-free numbers.
   - **Numbers assigned to**: What the numbers are assigned to. For example, users, or conferencing or voice features.
4. On the **Add account information** page, complete the following, and then click **Next**.

   > **IMPORTANT**
   > The information displayed on this page is determined by the country or region and number type. Each country and region have different regulations on the information that's required to port numbers. What you see on this page may be different from what's described here.

   - **Order details**:
     - **Order name**: Name of your order

- **Notification emails**: Email addresses to receive order notifications. If you enter multiple email addresses, separate each with a semicolon.
- **Transferred date**: Transfer date issued by your current service provider.

- **Phone number details**
  - **Port type**: Whether you're doing a full-port to transfer all your numbers or a partial-port to transfer some of your numbers.
- **Person requesting details**
  - Your organization name and contact details of the person requesting the transfer.
- **Current provider's details**
  - **Billing telephone number (BTN)**: Your BTN in E.164 format, which requires a + sign to prepend the number. For example, for a North America number, use +1XXXYYYZZZZ format.
  - Other details including the name of your current service provider, your account number, and your service address.

5. On the **Add numbers** page, click **Select a file**, browse to and select the CSV file that contains the phone numbers that you want to transfer, and then click **Next**.

   > **NOTE**
   > The CSV file must have only one column with a header named PhoneNumber. Each phone number must be on a separate row and can be digits only or in E.164 format.

6. On the **Complete your order** page, click **Upload a signed Letter of Authorization** to upload a scanned copy of the signed Letter of Authorization (LOA).

   If you haven't already downloaded and signed the LOA, do the following:

   a. Click **Download the template** to download the LOA for your country or region.
   b. Print the LOA.
   c. Have the LOA signed by the person who is authorized to make changes to the account.
   d. Scan the signed LOA, and then click **Upload a signed Letter of Authorization** to upload it.

   > **NOTE**
   > After you upload your LOA, submit your order. Just uploading the LOA isn't sufficient. You have to also submit the order for it be processed.

7. Review your order details, and then click **Submit**.

What happens next?

When we receive your port order, you'll get an email that verifies your request. Your request is checked and updated daily and you'll be notified of its progress and status in email. If your port request is rejected by the losing carrier, contact the PSTN service desk.

To view the status of your port order, in the left navigation of the Microsoft Teams admin center, go to > **Voice** > **Port orders**, and then click **Order history**. Each port order status is listed in the **Status** column. To learn more, see What's the status of your port orders?

Related topics

- What's a port order?
- Different kinds of phone numbers used for Calling Plans

- Manage phone numbers for your organization
- Emergency calling terms and conditions
- Emergency Calling disclaimer label

Manually submit a port order

9/17/2020 • 2 minutes to read • Edit Online

In some countries and regions, you may have to manually submit a service request to get phone numbers, transfer phone numbers, release phone numbers, or change addresses. To see what's required for each country and region or to learn more about number porting, see Manage phone numbers for your organization.

Use the steps in this article to manually submit a port order if your country or region isn't listed in the porting wizard in the Microsoft Teams admin center.

Manually submit a new port order request

To manually submit a new port order, send your completed Letter of Authorization (LOA) form directly to the PSTN service desk for your region.

1. Download the LOA for your country or region.
2. Complete the form.
3. Send it to the PSTN service desk for your region.

What else should you know about number porting

- To use Calling Plans you must purchase and assign licenses to your users. See Teams add-on licensing.
- You must assign the new phone numbers you have to each of your users. See Assign, change, or remove a phone number for a user.

Related topics

- What's a port order?
- Different kinds of phone numbers used for Calling Plans
- Manage phone numbers for your organization
- Emergency calling terms and conditions
- Emergency Calling disclaimer label

What's the status of your port orders?

5/11/2020 • 2 minutes to read • Edit Online

To see the status of your port order, in the left navigation of the Microsoft Teams admin center, go to > **Voice** > **Port orders**, and then click **Order history**. Each port order status is listed in the **Status** column. See how long does it take to port numbers to learn about the order process.

The following table lists port order statuses, as well as actions you can take if needed.

STATUS	CAN YOU VIEW THE ORDER?	CAN YOU EDIT THE ORDER?	CAN YOU CANCEL THE ORDER?	CAN YOU DELETE THE ORDER?	DESCRIPTION
Processing	Yes	No	Yes	No	The admin created the order, and it's been received by Microsoft.
Contacting carrier	Yes	No	Yes	No	The order has been received and approved by Microsoft, and we're working with the losing carrier to get it approved.
Transfer approved	Yes	No	Yes	No	The order has been accepted by the losing carrier, and the Firm Order Commitment (FOC) date has been set.
Transfer pending	Yes	No	No	No	The transfer is less than 24 hours away, so the order can no longer be edited or cancelled.
Error	No	Yes	Yes	Yes (at this time, you can't delete the port order if there's an error. The port order needs to be re-created, or you need to contact the PSTN service desk help.	The losing carrier rejected the order.

STATUS	CAN YOU VIEW THE ORDER?	CAN YOU EDIT THE ORDER?	CAN YOU CANCEL THE ORDER?	CAN YOU DELETE THE ORDER?	DESCRIPTION
Completed	Yes	No	No	No	The numbers have been successfully transferred.
Cancelled	No	Yes	No	No	The admin canceled the order.

For complete step-by-step instructions, see Transfer phone numbers to Teams.

If you need help or if you need to get more phone numbers, contact the PSTN service desk.

Related topics

- What's a port order?
- Different kinds of phone numbers used for Calling Plans
- Manage phone numbers for your organization
- Emergency calling terms and conditions
- Emergency Calling disclaimer label

What are dial plans?

12/5/2020 • 7 minutes to read • Edit Online

A dial plan is a named set of normalization rules that translate dialed phone numbers by an individual user into an alternate format (typically E.164) for purposes of call authorization and call routing.

A dial plan consists of one or more normalization rules that define how phone numbers expressed in various formats are translated to an alternate format. The same dial string may be interpreted and translated differently in different dial plans, so depending on which dial plan is assigned to a given user, the same dialed number may be translated and routed differently. There can be a maximum of 1,000 tenant dial plans.

See Create and manage dial plans to create and manage tenant dial plans.

Tenant dial plan scope

A dial plan's scope determines the hierarchical level at which the dial plan can be applied. Clients get the appropriate dial plan through provisioning settings that are automatically provided when users sign in to Teams. As an admin, you can manage and assign dial plan scope levels by using the Microsoft Teams admin center or Remote PowerShell.

In Teams, there are two types of dial plans: service-scoped and tenant-scoped (which is for your organization). A service-scoped dial plan is defined for every country or region where Phone System is available. Each user is automatically assigned the service country dial plan that matches the usage location assigned to the user. You can't change the service country dial plan, but you can create tenant scoped dial plans, which augment the service country dial plan. As clients are provisioned, they obtain an "effective dial plan," which is a combination of the service country dial plan and the appropriately scoped tenant dial plan. Therefore, it's not necessary to define all normalization rules in tenant dial plans as they might already exist in the service country dial plan.

Tenant dial plans can be further broken into two scopes - tenant-scope or user-scope. If a tenant defines and assigns a user-scoped dial plan, that user will be provisioned with an effective dial plan of the user's service country dial plan and the assigned user dial plan. If a tenant defines a tenant-scoped dial plan but doesn't assign a user-scoped dial plan, then that user will be provisioned with an effective dial plan of the user's service country dial plan and the tenant dial plan.

The following is the inheritance model of dial plans in Teams.



The following are the possible effective dial plans:

Service Country If no tenant scoped dial plan is defined and no tenant user scoped dial plan is assigned to the provisioned user, the user will receive an effective dial plan mapped to the service country associated with their usage location.

Tenant Global - Service Country If a tenant user dial plan is defined but not assigned to a user, the provisioned user will receive an effective dial plan consisting of a merged tenant dial plan and the service country dial plan associated with their usage location.

Tenant User - Service Country If a tenant user dial plan is defined and assigned to a user, the provisioned user will receive an effective dial plan consisting of the merged tenant user dial plan and the service country dial plan

associated with their usage location.

See Create and manage dial plans to create your tenant dial plans.

> **NOTE**
> In the scenario where no dial plan normalization rules apply to a dialed number, the dialed string is still normalized to prepend "+CC" where CC is the country code of the dialing user's usage location. This applies to Calling Plans, Direct Routing and PSTN Conference dial-out scenarios.

Planning for tenant dial plans

To plan custom dial plans, follow these steps:

- **Step 1** Decide whether a custom dial plan is needed to enhance the user dialing experience. Typically, the need for one would be to support non-E.164 dialing, such as extensions or abbreviated national dialing.
- **Step 2** Determine whether tenant global or tenant user scoped dial plans are needed, or both. User scoped dial plans are needed if users have different local dialing requirements.
- **Step 3** Identify valid number patterns for each required dial plan. Only the number patterns that are not defined in the service level country dial plans are required.
- **Step 4** Develop an organization-wide scheme for naming dial plans. Adopting a standard naming scheme assures consistency across an organization and makes maintenance and updates easier.

Creating your new tenant dial plan

When you create a new dial plan, you must put in the information that is required.

Name and simple name

For user dial plans, you should specify a descriptive name that identifies the users to which the dial plan will be assigned. The dial plan Simple Name is pre-populated with a string that is derived from the dial plan name. The Simple Name field is editable, which enables you to create a more descriptive naming convention for your dial plans. The Simple Name value cannot be empty and must be unique. A best practice is to develop a naming convention for your entire organization and then use this convention consistently across all sites and users.

Description

We recommend that you type the common, recognizable name of the geographic location or group of users to which the corresponding dial plan applies.

External access prefix

You can specify an external access prefix of up to four characters (#, *, and 0-9) if users need to dial one or more additional leading digits (for example, 9) to get an external line.

> **NOTE**
> If you specify an external access prefix, you don't need to create an additional normalization rule to accommodate the prefix.

See Create and manage dial plans to create your tenant dial plans.

Normalization rules

Normalization rules define how phone numbers expressed in various formats are to be translated. The same number string may be interpreted and translated differently, depending on the locale from which it is dialed.

Normalization rules may be necessary if users need to be able to dial abbreviated internal or external numbers.

One or more normalization rules must be assigned to the dial plan. Normalization rules are matched from top to bottom, so the order in which they appear in a tenant dial plan is important. For example, if a tenant dial plan has 10 normalization rules, the dialed number matching logic will be tried starting with the first normalization rule, if there isn't a match then the second, and so forth. If a match is made, that rule is used and there is no effort to match any other rules that are defined. There can be a maximum of 50 normalization rules in a given tenant dial plan.

Determining the required normalization rules

Because any tenant dial plan is effectively merged with a given user's service country dial plan, it is likely that the service country dial plan's normalization rules need to be evaluated in order to determine which tenant dial plan normalization rules are needed. The **Get-CsEffectiveTenantDialPlan** cmdlet can be used for this purpose. The cmdlet takes the user's identity as the input parameter and will return all normalization rules that are applicable to the user.

Creating normalization rules

Normalization rules use .NET Framework regular expressions to specify numeric match patterns that the server uses to translate dial strings to E.164 format. Normalization rules can be created by specifying the regular expression for the match and the translation to be done when a match is found. When you finish, you can enter a test number to verify that the normalization rule works as expected.

For details about using .NET Framework regular expressions, see .NET Framework Regular Expressions.

See Create and manage dial plans to create and manage normalization rules for your tenant dial plans.

Sample normalization rules

The following table shows sample normalization rules that are written as .NET Framework regular expressions. The samples are examples only and are not meant to be a prescriptive reference for creating your own normalization rules.

Normalization rules using .NET Framework regular expressions

RULE NAME	DESCRIPTION	NUMBER PATTERN	TRANSLATION	EXAMPLE
4digitExtension	Translates 4-digit extensions.	^(\d{4})$	+1425555$1	0100 is translated to +14255550100
5digitExtension	Translates 5-digit extensions.	^5(\d{4})$	+1425555$1	50100 is translated to +14255550100
7digitcallingRedmond	Translates 7-digit numbers to Redmond local numbers.	^(\d{7})$	+1425$1	5550100 is translated to +14255550100
RedmondOperator	Translates 0 to Redmond Operator.	^0$	+14255550100	0 is translated to +14255550100
RedmondSitePrefix	Translates numbers with on-net prefix (6) and Redmond site code (222).	^6222(\d{4})$	+1425555$1	62220100 is translated to +14255550100

RULE NAME	DESCRIPTION	NUMBER PATTERN	TRANSLATION	EXAMPLE
5digitRange	Translates 5-digit extensions starting with the digit range between 3-7 inclusive.	^([3-7]\d{4})$	+142555$1	54567 is translated to +14255554567
PrefixAdded	Adds a country prefix in front of a 9 digit number with restrictions on the first and third digits.	^([2-9]\d\d[2-9]\d{6})$	1$1	4255554567 is translated to 14255554567
NoTranslation	Match 5 digits but no translation.	^(\d{5})$	$1	34567 is translated to 34567

Redmond dial plan based on normalization rules shown above.

The following table illustrates a sample dial plan for Redmond, Washington, United States, based on the normalization rules shown in the previous table.

REDMOND DIAL PLAN
5digitExtension
7digitcallingRedmond
RedmondSitePrefix
RedmondOperator

> **NOTE**
> The normalization rules names shown in the preceding table don't include spaces, but this is a matter of choice. The first name in the table, for example, could have been written "5 digit extension" or "5-digit Extension" and still be valid.

Related topics

Create and manage dial plans

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Create and manage dial plans

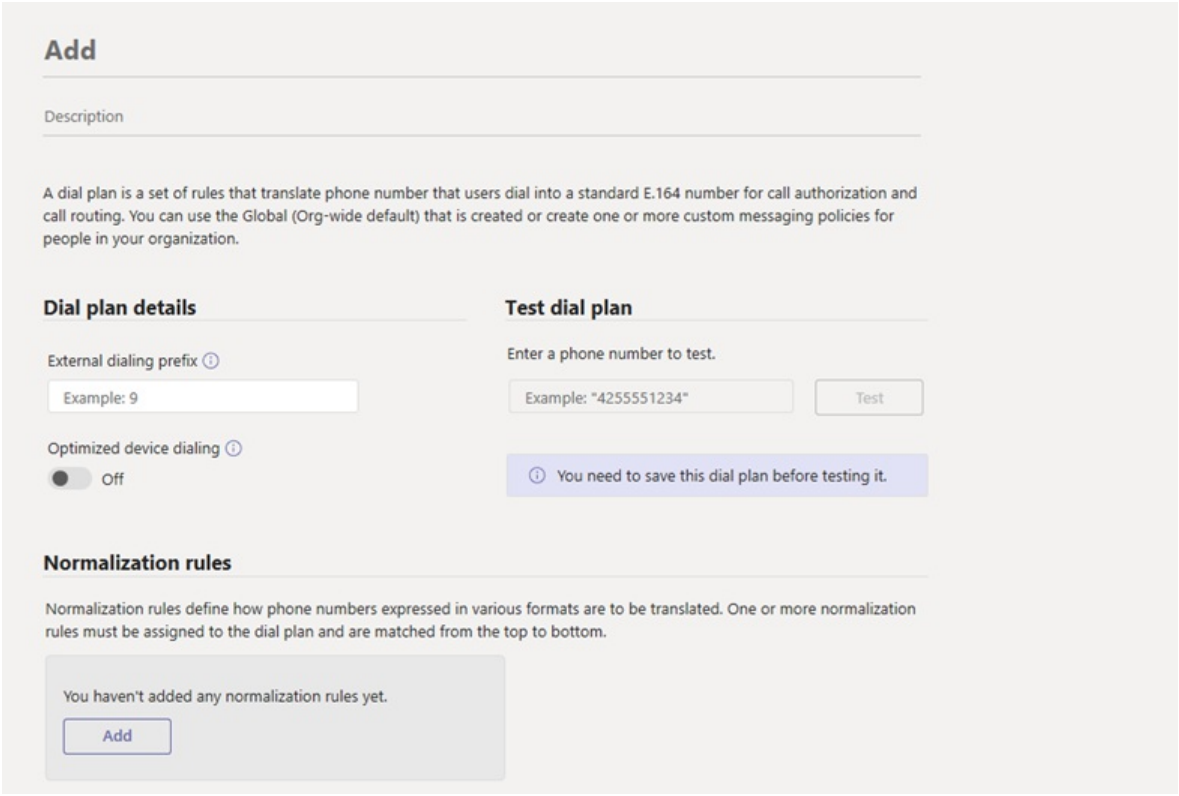
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After you plan the dial plans for your organization and figured out all the normalization rules that need to be created for call routing, you're ready to create the dial plans. You can use the Microsoft Teams admin center or Windows PowerShell to create and manage dial plans.

Using the Microsoft Teams admin center

Create a dial plan

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Dial plan**.
2. Click **Add**, and then enter a name and description for the dial plan.



3. Under **Dial plan details**, specify an external dialing prefix if users need to dial one or more additional leading digits (for example, 9) to get an external line. To do this:
   a. In the **External dialing prefix** box, enter an external dialing prefix. The prefix can be up to four characters (#,*, and 0-9).
   b. Turn on **Optimized device dialing**. If you specify an external dialing prefix, you must also turn on this setting to apply the prefix so calls can be made outside your organization.
4. Under **Normalization rules**, configure and associate one or more normalization rules for the dial plan. Each dial plan must have at least one normalization rule associated with it. To do this, do one or more of the following:
   - To create a new normalization rule and associate it with the dial plan, click **Add**, and then define the rule.
   - To edit a normalization rule that's already associated with the dial plan, select the rule by clicking to the left of the rule name, and then click **Edit**. Make the changes you want, and then click **Save**.
   - To remove a normalization rule from the dial plan, select the rule by clicking to the left of the rule

name, and then click **Remove**.

5. Arrange the normalization rules in the order that you want. Click **Move up** or **Move down** to change the position of rules in the list.

   > **NOTE**
   > Teams traverses the list of normalization rules from the top down and uses the first rule that matches the dialed number. If you set up a dial plan so that a dialed number can match more than one normalization rule, make sure the more restrictive rules are sorted above the less restrictive ones.

6. Click **Save**.

7. If you want to test the dial plan, under **Test dial plan**, enter a phone number, and then click **Test**.

Edit a dial plan

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Dial plan**.
2. Select the dial plan by clicking to the left of the dial plan name, and then click **Edit**.
3. Make the changes that you want, and then click **Save**.

Assign a dial plan to users

You assign a dial plan in the same way you assign policies. You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Using PowerShell

Verify and start Remote PowerShell

Check that you are running Windows PowerShell version 3.0 or later

1. To verify that you're running version 3.0 or higher: **Start Menu** > **Windows PowerShell**.

2. Check the version by typing *Get-Host* in the **Windows PowerShell** window.

3. If you don't have version 3.0 or later, download and install updates to Windows PowerShell. See Windows Management Framework 4.0 to download and update Windows PowerShell to version 4.0. Restart your computer when you're prompted.

4. You'll also need to install the Windows PowerShell module for Skype for Business Online that enables you to create a remote Windows PowerShell session that connects to Skype for Business Online. You can download this module, which is supported only on 64-bit computers, at Windows PowerShell Module for Skype for Business Online. Restart your computer if you're prompted.

To learn more, see Connect to all Microsoft 365 or Office 365 services in a single Windows PowerShell window.

Start a Windows PowerShell session

1. Click **Start** > **Windows PowerShell**.

2. In the **Windows PowerShell** window, connect to Microsoft 365 or Office 365 by running:

> **NOTE**
>
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module.
>
> If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
Import-Module -Name MicrosoftTeams
$credential = Get-Credential
$session = New-CsOnlineSession -Credential $credential
Import-PSSession $session
```

Create and manage your dial plans

You can either use a single cmdlet or a PowerShell script to create and manage tenant dial plans.

Using single cmdlets

- To create a new dial plan, run:

  ```
  New-CsTenantDialPlan -Identity RedmondDialPlan -Description "Dial Plan for Redmond" -
  NormalizationRules <pslistmodifier> -ExternalAccessPrefix 9 -SimpleName "Dial-Plan-for-Redmond"
  ```

  For other examples and parameters, see New-CsTenantDialPlan.

- To edit the settings of an existing dial plan, run:

  ```
  Set-CsTenantDialPlan -Identity RedmondDialPlan  -NormalizationRules <pslistmodifier> -
  ExternalAccessPrefix 9
    -SimpleName "Dial-Plan-for-Redmond"
  ```

  For other examples and parameters, see Set-CsTenantDialPlan.

- To add users to a dial plan, run:

  ```
  Grant-CsTenantDialPlan -Identity amos.marble@contoso.com -PolicyName RedmondDialPlan
  ```

  For other examples and parameters, see Grant-CsTenantDialPlan.

- To view the settings on a dial plan, run:

  ```
  Get-CsTenantDialPlan -Identity RedmondDialPlan
  ```

  For other examples and parameters, see Get-CsTenantDialPlan.

- To delete a dial plan, run:

  ```
  Remove-CsTenantDialPlan -Identity RedmondDialPlan -force
  ```

  For other examples and parameters, see Remove-CsTenantDialPlan.

- To see the settings of the effective dial plan, run:

  ```
  Get-CsEffectiveTenantDialPlan -Identity amos.marble@contoso.com
  ```

For other examples and parameters, see Get-CsEffectiveTenantDialPlan.

- To test the effective settings of a dial plan, run:

```
Test-CsEffectiveTenantDialPlan -DialedNumber 14255550199 -Identity amos.marble@contoso.com
```

For other examples and parameters, see Test-CsEffectiveTenantDialPlan.

Using a PowerShell script

Run this to delete a normalization rule that is associated with a tenant dial plan without needing to delete the tenant dial plan first:

```
$b1=New-CsVoiceNormalizationRule -Identity Global/NR4 -InMemory
Set-CsTenantDialPlan -Identity RedmondDialPlan -NormalizationRules @{add=$b1}
(Get-CsTenantDialPlan -Identity RedmondDialPlan).NormalizationRules
$b2=New-CsVoiceNormalizationRule -Identity Global/NR4 -InMemory
Set-CsTenantDialPlan -Identity RedmondDialPlan -NormalizationRules @{remove=$b2}
```

Run this to add the following normalization rule to the existing tenant dial plan named RedmondDialPlan.

```
$nr1=New-CsVoiceNormalizationRule -Parent Global -Description 'Organization extension dialing' -Pattern
'^(\\d{3})$' -Translation '+14255551$1' -Name NR1 -IsInternalExtension $false -InMemory
Set-CsTenantDialPlan -Identity RedmondDialPlan -NormalizationRules @{add=$nr1}
```

Run this to remove the following normalization rule from the existing tenant dial plan named RedmondDialPlan.

```
$nr1=New-CsVoiceNormalizationRule -Parent Global/NR1 -InMemory
Set-CsTenantDialPlan -Identity RedmondDialPlan -NormalizationRules @{remove=$nr1}
```

Run the following when you want to also examine the existing normalization rules, determine which one you want to delete, and then use its index to remove it. The array of normalization rules starts with index 0. We would like to remove the 3-digit normalization rule, so that is index 1.

```
Get-CsTenantDialPlan RedmondDialPlan).NormalizationRules
Description         : 4-digit
Pattern             : ^(\\d{4})$
Translation         : +1426666$1
Name                : NR2
IsInternalExtension : False

Description         : 3-digit
Pattern             : ^(\\d{3})$
Translation         : +14255551$1
Name                : NR12
IsInternalExtension : False

$nr1=(Get-CsTenantDialPlan RedmondDialPlan).NormalizationRules[1]
Set-CsTenantDialPlan -Identity RedmondDialPlan -NormalizationRules @{remove=$nr1}
```

Run this to find all users who have been granted the RedmondDialPlan tenant dial plan.

```
Get-CsOnlineUser | Where-Object {$_.TenantDialPlan -eq "RedmondDialPlan"}
```

Run this to remove any assigned TenantDialPlan from all users who have a HostingProvider of sipfed.online.lync.com.

```
Get-CsOnlineUser -Filter {HostingProvider -eq "sipfed.online.lync.com"} | Grant-CsTenantDialPlan -policyname
$null
```

Run these to add the existing on-premises dial plan named OPDP1 as a tenant dial plan for your organization. You need to first save the on-premises dial plan to an .xml file, and then use it to create the new tenant dial plan.

Run this to save the on-premises dial plan to the .xml file.

```
$DPName = "OPDP1"
$DPFileName = "dialplan.xml"
Get-CsDialplan $DPName | Export-Clixml $DPFileName
```

Run this to create the new tenant dial plan.

```
$DPFileName = "dialplan.xml"
$dp = Import-Clixml $DPFileName
$NormRules = @()
ForEach($nr in $dp.NormalizationRules)
{
 $id1 = "Global/" + $nr.Name
 $nr2 = New-CsVoiceNormalizationRule -Identity $id1 -Description $nr.Description -Pattern $nr.Pattern -
Translation $nr.Translation -IsInternalExtension $nr.IsInternalExtension -InMemory
 $NormRules += $nr2
}
New-CsTenantDialPlan -Identity $dp.SimpleName -ExternalAccessPrefix $dp.ExternalAccessPrefix -Description
$dp.Description -OptimizeDeviceDialing $dp.OptimizeDeviceDialing -SimpleName $dp.SimpleName -
NormalizationRules $NormRules
```

Related topics

- What are dial plans?
- Transferring phone numbers common questions
- Different kinds of phone numbers used for Calling Plans
- Manage phone numbers for your organization
- Emergency calling terms and conditions
- Emergency calling disclaimer label
- Teams PowerShell overview

Add and update reporting labels

7/8/2020 • 2 minutes to read • Edit Online

Reporting labels are used in your organization to indicate the physical locations of offices, buildings, or organizational sites. The Reporting labels page in the Microsoft Teams admin center lets you provide a text file (.csv or .tsv) containing a list of physical locations and their associated network subnets. This file is used by Call Analytics for generating reports. When you upload your subnet mapping, the reports provided by these services will contain the location names as well, making the reports easier to understand and use for remediating any potential issues.

> **IMPORTANT**
>
> Reporting Labels that you upload will be handled as *Support Data* under your agreement for Office 365, including any information that would otherwise be considered *Customer Data* or *Personal Data*. Please don't include data you do not wish to provide to Microsoft as *Support Data*, as this information will be visible to Microsoft Engineers for support purposes.

The report labels and locations data you provide is a single data structure – there's currently no interface available to make individual edits to the data.

To edit the table of subnets and locations

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Reporting labels**.
2. Click **Replace locations data**.
3. In the **Replace locations data** pane, click **Select a file**, and then browse to and upload your edited .csv or .tsv file.
4. Click **Upload**.

You can download a sample template here.

Use the following example to help create your data file.

> **IMPORTANT**
>
> Your data file shouldn't contain column headers (such as Network, Network Name, etc.). These are used here for informational purposes only.

NETWORK	NETWORK NAME	NETWORK RANGE	BUILDING NAME	OWNERSHIP TYPE	BUILDING TYPE	BUILDING OFFICE TYPE	CITY	ZIP CODE	COUNTRY	STATE	REGION	INSIDE CORP	EXPRESS ROUTE
10.0.128.0	SVC-1	32	USCAMTV001	Contoso Leased RE&F	Office	RE&F	Mountain View	94043	US	CA	US	1	1

NETWORK	NETWORK NAME	NETWORK RANGE	BUILDING NAME	OWNERSHIP TYPE	BUILDING TYPE	BUILDING OFFICE TYPE	CITY	ZIP CODE	COUNTRY	STATE	REGION	INSIDE CORP	EXPRESS ROUTE
10.0.130.0	SVC-1	32	USCAMTV001	Contoso Leased RE&F	Office	RE&F	Mountain View	94043	US	CA	US	1	1
10.0.131.0	SVC-1	32	USCAMTV001	Contoso Leased RE&F	Office	RE&F	Mountain View	94043	US	CA	US	1	1
10.0.132.0	SVC-1	32	USCAMTV001	Contoso Leased RE&F	Office	RE&F	Mountain View	94043	US	CA	US	1	1

For more information about formatting your data file, see Tenant data file format and Building data file structure.

Related topics

Set up Call Analytics

Network settings for cloud voice features in Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

Learn about network regions, network sites, network subnets, and trusted IP addresses. These terms and concepts are used throughout our cloud voice documentation for Location-Based Routing for Direct Routing and dynamic emergency calling. If you're deploying these cloud features in your organization, you must configure network settings for use with these features in Microsoft Teams.

This article gives you an overview of the network settings that are common to Location-Based Routing and dynamic emergency calling. Depending on the cloud voice feature and capability that you're deploying, you configure some or all these settings. For steps on how to configure these settings, see Manage your network topology for cloud features in Teams.

> **NOTE**
> Any feature-specific requirements for network settings are documented in the configuration topics for that feature.

Network region

A network region contains a collection of network sites. It interconnects various parts of a network across multiple geographic areas. For example, if your organization has many sites located in India, you may choose to designate "India" as a network region. Each network site must be associated with a network region.

The same network regions are shared by Location-Based Routing for Direct Routing and enhanced emergency services. If you already created network regions for one feature, you don't have to create new network regions for the other feature.

Network site

A network site represents a location where your organization has a physical venue, such as an office, a set of buildings, or a campus. Network sites are defined as a collection of IP subnets. Each network site must be associated with a network region.

You can also use network sites to enable and configure emergency calling.

Network subnet

Each subnet must be associated with a specific network site. A client's location is determined based on the network subnet and the associated network site. You can associate multiple subnets with the same network site but you can't associate multiple sites with the same subnet.

Subnet information is used to determine the network site on which an endpoint is located when a new session is initiated. When the location of each party in a session is known, the cloud voice feature can apply that information to determine how to handle call setup or routing.

For each network site, work with your network admin to determine which IP subnets are assigned to each network site. For example, the New York site in the North America region can be assigned the following IP subnets: 172.29.80.0/23, 157.57.216.0/25, 172.29.91.0/23, 172.29.81.0/24. If Bob, who usually works in Detroit, travels to the New York office for training, turns on his computer and connects to the network, his computer will

get an IP address in one of the four ranges that are allocated for New York, for example, 172.29.80.103.

Trusted IP address

Trusted IP addresses are the internet external IP addresses of the enterprise network. They determine whether the user's endpoint is inside the corporate network before checking for a specific site match.

If the user's external IP address matches an IP address that's in the trusted IP address list, the cloud voice feature checks to determine the internal subnet where the user's endpoint is located. A match can be made against either IPv4 or IPv6 IP addresses and is dependent upon the format of the IP packet sent to the network settings. (If a public IP address has both IPv4 and IPv6, you must add both as trusted IP addresses.)

If the user's external IP address doesn't match an IP address that's in the trusted IP address list, the endpoint is classified as being at an unknown location.

Manage your network topology for cloud voice features in Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

If your organization is deploying Location-Based Routing for Direct Routing or dynamic emergency calling, you must configure network settings for use with these cloud voice features in Microsoft Teams. Network settings are used to determine the location of a Teams client and include network regions, network sites, subnets, and trusted IP addresses. Depending on the cloud voice feature and capability that you're deploying, you configure some or all these settings. To learn more about these terms, see Network settings for cloud voice features.

You configure network settings on the **Network topology** page of the Microsoft Teams admin center or by using Windows PowerShell.

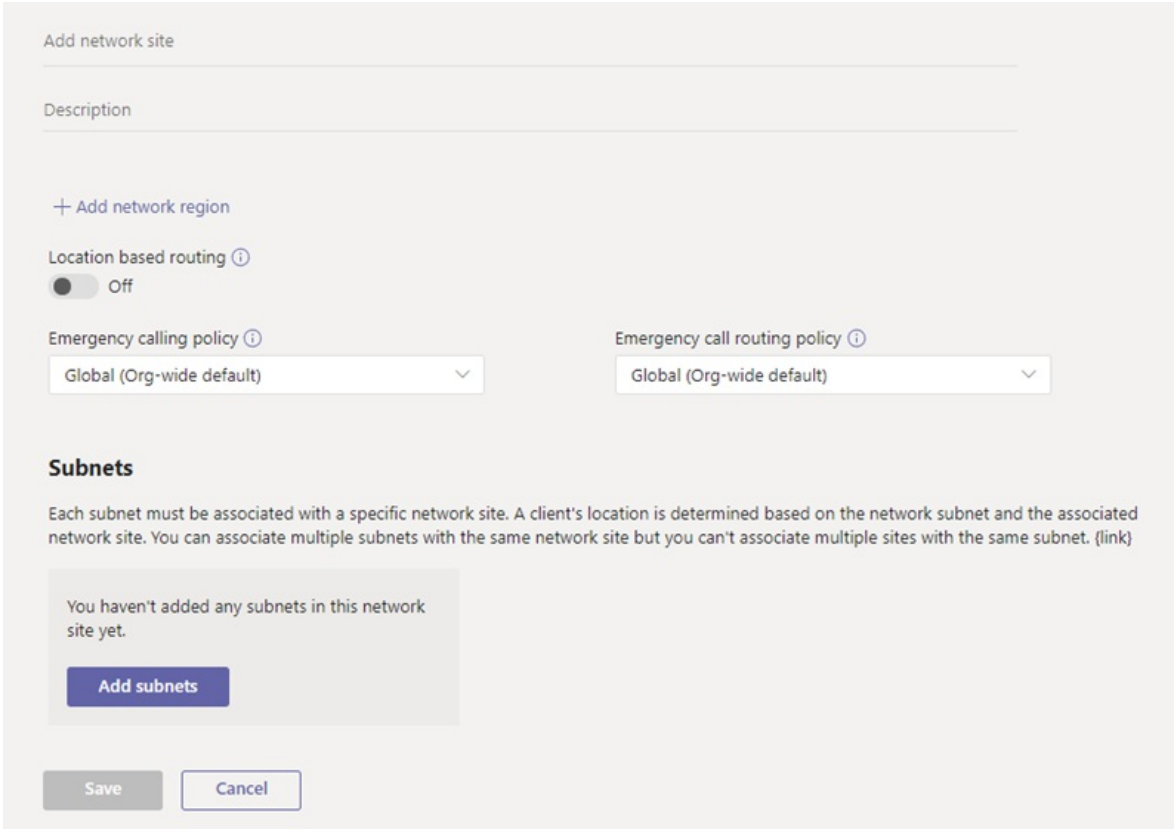
Configure network settings in the Microsoft Teams admin center

This is a preview or early release feature.

You define network regions, network sites, and subnets on the **Network sites** tab of the **Network topology** page. Here, you can create or modify a network site, associate a site with a network region, associate a subnet to the site, turn on Location-based Routing, and assign emergency policies to the site. You can also add network regions that can be used globally for all sites.

Add and configure a network site

1. In the left navigation of the Microsoft Teams admin center, go to **Locations** > **Network topology**, and then click the **Network sites** tab.
2. Click **Add**, and then enter a name and description for the site.



3. To associate the site with a network region, click **Add network region**, select an existing region or click

Add to add a region, and then click **Link**.

4. To enable Location-Based Routing for the site, turn on **Location based routing**.
5. To assign emergency services policies to the site, do one or both of the following:
   - If your organization uses Calling Plans or deployed Phone System Direct Routing, under **Emergency calling policy**, select the policy that you want.
   - If your organization deployed Phone System Direct Routing, under **Emergency call routing policy**, select the policy that you want.
6. To associate a subnet to the site, under **Subnets**, click **Add subnets**. Specify the IP version, IP address, network range, add a description, and then click **Apply**. Each subnet must be associated with a specific site.
7. Click **Save**.

Modify a network site

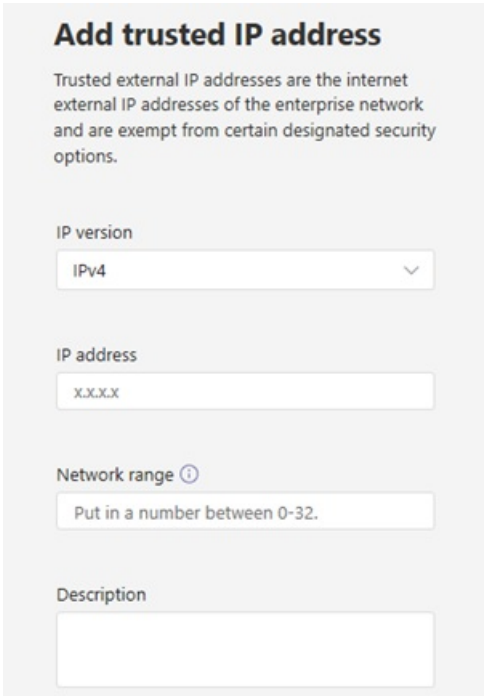
1. In the left navigation of the Microsoft Teams admin center, go to **Locations** > **Network topology**, and then click the **Network sites** tab.
2. Select the site by clicking to the left of the site name, and then click **Edit**.
3. Make the changes that you want, and then click **Save**.

Manage external trusted IP addresses

You manage external trusted IP addresses on the **Trusted IPs** tab on the **Network topology** page of the Microsoft Teams admin center. You can add an unlimited number of external trusted IP addresses.

Add a trusted IP address

1. In the left navigation of the Microsoft Teams admin center, go to **Locations** > **Network topology**, and then click the **Trusted IPs** tab.
2. Click **New**.
3. In the **Add trusted IP address** pane, specify the IP version, IP address, network range, add a description, and then click **Apply**.



Edit a trusted IP address

1. In the left navigation of the Microsoft Teams admin center, go to **Locations** > **Network topology**, and then click the **Trusted IPs** tab.

2. Select the IP address by clicking to the left of it, and then click **Edit**.
3. In the **Edit trusted IP address** pane, make the changes that you want, and then click **Apply**.

Configure network settings using PowerShell

To complete the steps in this section, you'll need some familiarity with PowerShell cmdlets. To learn more, see Teams PowerShell Overview.

Define network regions

Use the New-CsTenantNetworkRegion cmdlet to define network regions. Note that the RegionID parameter is a logical name that represents the geography of the region and has no dependencies or restrictions and the CentralSite <site ID> parameter is optional.

```
New-CsTenantNetworkRegion -NetworkRegionID <region ID>
```

In this example, we create a network region named India.

```
New-CsTenantNetworkRegion -NetworkRegionID "India"
```

See also Set-CsTenantNetworkRegion.

Define network sites

Use the New-CsTenantNetworkSite cmdlet to define network sites. Each network site must be associated with a network region.

```
New-CsTenantNetworkSite -NetworkSiteID <site ID> -NetworkRegionID <region ID>
```

In this example, we create two new network sites, Delhi and Hyderabad, in the India region.

```
New-CsTenantNetworkSite -NetworkSiteID "Delhi" -NetworkRegionID "India"
New-CsTenantNetworkSite -NetworkSiteID "Hyderabad" -NetworkRegionID "India"
```

The following table shows the network sites defined in this example.

	SITE 1	SITE 2
Site ID	Site 1 (Delhi)	Site 2 (Hyderabad)
Region ID	Region 1 (India)	Region 1 (India)

See also Set-CsTenantNetworkRegion.

Define network subnets

Use the New-CsTenantNetworkSubnet cmdlet to define network subnets and associate them to network sites. Each network subnet can only be associated with one site.

```
New-CsTenantNetworkSubnet -SubnetID <Subnet IP address> -MaskBits <Subnet bitmask> -NetworkSiteID <site ID>
```

In this example, we create an association between subnet 192.168.0.0 and the Delhi network site and between subnet 2001:4898:e8:25:844e:926f:85ad:dd8e and the Hyderabad network site.

```
New-CsTenantNetworkSubnet -SubnetID "192.168.0.0" -MaskBits "24" -NetworkSiteID "Delhi"
New-CsTenantNetworkSubnet -SubnetID "2001:4898:e8:25:844e:926f:85ad:dd8e" -MaskBits "120" -NetworkSiteID
"Hyderabad"
```

The following table shows the subnets defined in this example.

	SITE 1	SITE 2
Subnet ID	192.168.0.0	2001:4898:e8:25:844e:926f:85ad:dd8e
Mask	24	120
Site ID	Site (Delhi)	Site 2 (Hyderabad)

For multiple subnets, you can import a CSV file by using a script such as the following.

```
Import-CSV C:\subnet.csv | foreach {New-CsTenantNetworkSubnet –SubnetID $_.Identity -MaskBits $_.Mask -
NetworkSiteID $_.SiteID}
```

In this example, the CSV file looks something like this:

```
Identity, Mask, SiteID
172.11.12.0, 24, Redmond
172.11.13.0, 24, Chicago
172.11.14.0, 25, Vancouver
172.11.15.0, 28, Paris
```

See also Set-CsTenantNetworkSubnet.

Define external subnets (external trusted IP addresses)

Use the New-CsTenantTrustedIPAddress cmdlet to define external subnets and assign them to the tenant. You can define an unlimited number of external subnets for a tenant.

```
New-CsTenantTrustedIPAddress -IPAddress <External IP address> -MaskBits <Subnet bitmask> -Description
<description>
```

For example:

```
New-CsTenantTrustedIPAddress -IPAddress 198.51.100.0 -MaskBits 30 -Description "Contoso address"
```

See also Set-CsTenantTrustedIPAddress.

Related topics

- Network settings for cloud voice features in Teams

Manage emergency calling

12/5/2020 • 11 minutes to read • Edit Online

This article describes concepts you'll need to know to manage emergency calling—it includes information about emergency addresses, dynamic emergency addresses, and emergency call routing. This article uses the following terminology:

- **Emergency address** - A civic address—the physical or street address of a place of business for your organization.

  For example, the address *12345 North Main Street, Redmond, WA 98052* is used to route emergency calls to the appropriate dispatch authorities and to assist in locating the emergency caller.

- **Place** - Typically a floor, building, wing, or office number. Place is associated with an emergency address to give a more exact location within a building. You can have an unlimited number of places associated with an emergency address. For example, if your organization has multiple buildings, you might want to include place information for each building and for every floor within each building.

- **Emergency location** - A location is a civic address—with an optional place. If your business has more than one physical location, it's likely that you'll need more than one emergency location.

  When you create an emergency address, a unique location ID is automatically created for this address. If you add a place to an emergency address—for example, if you add a floor to a building address—a location ID is created for the combination of the emergency address and place. In this example, there will be two location IDs: one for the civic address; one for the joined civic address and associated place.

  When you assign an emergency location to a user or site, it's this unique location ID that's associated with the user or site.

- **Registered address** - An emergency address that is assigned to each Calling Plan user; it is sometimes referred to as a static emergency address or address of record. (Registered addresses do not apply to Direct Routing users.)

You create emergency addresses for Calling Plan users by using the Teams admin center.

> **NOTE**
> There are some differences in how you manage emergency calling depending on whether you are using Phone System Calling Plans or Phone System Direct Routing for your PSTN connectivity. These considerations are described throughout this article.

Emergency address validation

To assign an emergency address to a user or to a network identifier, you must ensure that the emergency address is marked as "validated." Address validation ensures that the address is legitimate, and that it cannot be modified after it is assigned.

If you define an emergency address by using the address map search feature in the Teams admin center, the address is automatically marked as validated. You cannot modify a validated emergency address. Therefore, if the format or representation of the address changes, you must create a new address with the updated format.

Emergency address geo codes

Each emergency address can have a geo code (latitude and longitude) associated with it. These geo codes are used in some countries to assist in routing emergency calls with dynamic locations.

If you define an emergency address by using the address map search feature in the Teams admin center, the geo code is automatically associated with an emergency address. You can also associate geo codes with an address if you define the address by using PowerShell. However, Microsoft recommends that you create emergency addresses for Calling Plan by using the map search feature in Teams admin center, which will ensure that the addresses are formatted, validated, and have the appropriate geo codes.

> **IMPORTANT**
> To assign an emergency location to a network identifier for dynamic emergency calling, the emergency address must contain an appropriate geo code.

Considerations for Calling Plans

To find out whether Calling Plans is available in your area, see Country and region availability for Calling Plans.

Emergency call enablement

Each Calling Plan user is automatically enabled for emergency calling and is required to have a registered emergency address associated with their assigned telephone number.

When the location must be associated to the telephone number depends on the country/region:

- In the United States and Canada, for example, an emergency location is required when a number is assigned to a user.
- For other countries--such as in Europe, the Middle East, and Africa (EMEA)--an emergency location is required when you get the phone number from Microsoft 365 or Office 365, or when it's transferred from another service provider or carrier.

Dynamic emergency calling

Dynamic emergency calling for Microsoft Calling Plans provides the capability to configure and route emergency calls based on the current location of the Teams client. The ability to do automatic routing to the appropriate Public Safety Answering Point (PSAP) or to notify security desk personnel varies depending on the country of usage of the Teams user.

For Calling Plan users, dynamic location for routing emergency calls is only supported in the United States as follows. (For information about dynamic emergency calling and Direct Routing, see Considerations for Direct Routing.

- If a Teams client for a United States Calling Plan user dynamically acquires an emergency address within the United States, that address is used for emergency routing instead of the registered address, and the call will be automatically routed to the PSAP in the serving area of the address.
- If a Teams client for a United States Calling Plan user doesn't dynamically acquire an emergency address within the United States, then the registered emergency address is used to help screen and route the call. However, the call will be screened to determine if an updated address is required before connecting the caller to the appropriate PSAP.

In the United States, you must configure the civic address that is part of the emergency locations that are assigned to network identifiers—and include the associated geo codes. For more information, see Plan and configure dynamic emergency calling.

Emergency call routing

When a Teams Calling Plan user dials an emergency number, how the call is routed to the PSAP depends on the

following:

- Whether the emergency address is dynamically determined by the Teams client.
- Whether the emergency address is the registered address associated with the user's phone number.
- The emergency calling network of that country.

  In the United States:

  - If a Teams client is located at a tenant-defined dynamic emergency location, emergency calls from that client are automatically routed to the PSAP serving that geographic location.
  - If a Teams client is not located at a tenant-defined dynamic emergency location, emergency calls from that client are screened by a national call center to determine the location of the caller before transferring the call to the PSAP serving that geographic location.
  - If an emergency caller is unable to update their emergency location to the screening center, the call will be transferred to the PSAP serving the caller's registered address.

  In Canada, Ireland, and the United Kingdom, emergency calls are first screened to determine the current location of the user before connecting the call to the appropriate dispatch center.

  In France, Germany, and Spain, emergency calls are routed directly to the PSAP serving the emergency address associated with the number regardless of the location of the caller.

  In the Netherlands, emergency calls are routed directly to the PSAP for the local area code of the number regardless of the location of the caller.

  In Australia, emergency addresses are configured and routed by the carrier partner.

  In Japan, emergency calling is not supported.

For more information, see:

- Calling Plans
- Different kinds of phone numbers used for Calling Plans
- Emergency calling terms and conditions

Considerations for Direct Routing

If Calling Plans are not available in your area or you want to keep your existing carrier, consider Direct Routing. For more information, see Configure Direct Routing and Manage emergency call routing policies.

Emergency call enablement and configuration

You must define emergency calling policies for Direct Routing users by using a Teams emergency call routing policy (TeamsEmergencyCallRoutingPolicy) to define emergency numbers and their associated routing destination. (Note that registered emergency locations are not supported for Direct Routing users.)

You can assign an emergency call routing policy to a Teams Direct Routing user account, a network site, or both. When a Teams client starts or changes a network connection, Teams performs a lookup of the network site where the client is located as follows:

- If an emergency call routing policy is associated with the site, then the site policy is used to configure emergency calling.
- If there is no emergency call routing policy associated with the site, or if the client is connected at an undefined site, then the emergency call routing policy associated with the user account is used to configure emergency calling.

- If the Teams client is unable to obtain an emergency call routing policy, then the user is not enabled for emergency calling.

Dynamic emergency calling

Teams clients for Direct Routing users can acquire a dynamic emergency address, which can be used to dynamically route calls based upon the location of the caller. For more information, see Configure dynamic emergency calling.

Emergency call routing

The emergency call routing policy references an online PSTN usage, which must have the appropriate Direct Routing configuration to properly route the emergency calls to the appropriate PSTN gateway(s). In particular, you must ensure that there is an OnlineVoiceRoute for the emergency dial string. For more information, see Configure Direct Routing.

(Note: Teams clients prepend the "+" sign in front of emergency numbers in a similar manner that Skype for Business client does; that is, +911. This behavior will be modified in the coming months so that Teams emergency calls will no longer be sending a "+" preceding the number; that is, 911.)

The ability to dynamically route emergency calls for Direct Routing users varies depending on the emergency calling network within a given country. There are two solutions available:

- Emergency Routing Service Providers (US only)
- Emergency Location Identification Number (ELIN) gateway applications

Emergency Routing Service Providers

In the United States, there are numerous certified Emergency Routing Service Providers (ERSPs) that can automatically route emergency calls based upon the location of the caller.

- If an Emergency Routing Service Provider is integrated into a Direct Routing deployment, emergency calls with a dynamically acquired location will be automatically routed to the Public Safety Answering Point (PSAP) serving that location.
- Emergency calls without a dynamically acquired location are first screened to determine the current location of the user before connecting the call to the appropriate dispatch center based upon the updated location.

For more information, see Session Border Controllers certified for Direct Routing.

Emergency Location Identification Number (ELIN) applications

Session Border Controllers (SBCs) can include Emergency Location Identification Number (ELIN) applications. If an SBC ELIN application is integrated into a Direct Routing deployment, you must configure the emergency addresses and associated telephone numbers in the ELIN application, and then upload the ELIN records to the emergency calling database in the respective PSTN. Teams emergency locations with an ELIN identifier must match those within the ELIN application.

When an emergency call with a dynamically acquired location is routed to the appropriate SBC, the ELIN application:

- Parses the emergency location of the caller.
- Matches the location to an ELIN record.
- Substitutes the emergency caller's number with the ELIN phone number.
- Routes the call to the PSAP serving that location, and then the dispatchers obtain the location from the uploaded ELIN record.

Upon a call back to the emergency number, the ELIN application will do the reverse called number substitution to that of the original emergency caller.

For more information, see Session Border Controllers certified for Direct Routing.

Security desk notification

Security desk notification is available with both Microsoft Calling Plans and Phone System Direct Routing.

You use a Teams emergency calling policy (TeamsEmergencyCallingPolicy) to configure who should be notified during an emergency call and how they are notified: chat only, conferenced in and muted, or conferenced in and muted but with the ability to unmute. You can also specify an external PSTN number of a user or group to call and join the emergency call.

An emergency calling policy can be granted to a Teams user account, assigned to a network site, or both. When a Teams client starts or changes a network connection, Teams performs a lookup of the network site where the client is located:

- If an emergency calling policy is associated with a network site, then the site policy is used to configure security desk notification.
- If there is no emergency calling policy associated with the site, or if the client is connected at an undefined site, then the emergency calling policy associated with the user account is used to configure security desk notification.
- If the Teams client is unable to obtain an emergency calling policy, then the user is not enabled for security desk notification.

During an emergency call, a security desk is conferenced into the call and the experience of the security desk user is controlled based upon the Teams emergency calling policy. A group chat is started with each security desk member, and the location of the emergency caller is shared via an important message notification. If a conference option is configured as part of the policy, each security desk user is additionally called as part of the conference.

Related topics

- Manage emergency calling policies
- Manage emergency call routing policies
- Add, change, or remove an emergency location for your organization
- Assign or change an emergency location for your user
- Plan and configure dynamic emergency calling

Plan and configure dynamic emergency calling

12/5/2020 • 10 minutes to read • Edit Online

Dynamic emergency calling for Microsoft Calling Plans and Phone System Direct Routing provides the capability to configure and route emergency calls and notify security personnel based on the current location of the Teams client.

Based on the network topology that the tenant administrator defines, the Teams client provides network connectivity information in a request to the Location Information Service (LIS). If there's a match, the LIS returns a location to the client. This location data is transmitted back to the client.

The Teams client includes location data as part of an emergency call. This data is then used by the emergency service provider to determine the appropriate Public Safety Answering Point (PSAP) and to route the call to that PSAP, which allows the PSAP dispatcher to obtain the caller's location.

For dynamic emergency calling, the following must occur:

1. The network administrator configures network settings and the LIS to create a network/emergency location map.

   For Direct Routing, additional configuration is required for routing emergency calls and possibly for partner connectivity. The administrator must configure connection to an Emergency Routing Service (ERS) provider (United States) **OR** configure the Session Border Controller (SBC) for an Emergency Location Identification Number (ELIN) application.

2. During startup and periodically afterwards, or when a network connection is changed, the Teams client sends a location request that contains its network connectivity information to the network settings and the LIS.

   - If there's a network settings site match – emergency calling policies are returned to the Teams client from that site. (For more information about policies, see Configure emergency policies).
   - If there's an LIS match – an emergency location from the network element the Teams client is connected to is returned to the Teams client. The match is performed in the following order with the first matched result being returned:
     - WAP
     - Ethernet switch/port
     - Ethernet switch
     - Subnet
3. When the Teams client makes an emergency call, the emergency location is conveyed to the PSTN network.

   For Direct Routing, the administrator must configure the SBC to send emergency calls to the ERS provider or configure the SBC ELIN application.

This article contains the following sections.

- Configure emergency addresses
- Configure network settings
- Configure Location Information Service
- Configure emergency policies
- Enable users and sites

- Test emergency calling

The ability to do automatic routing to the appropriate Public Safety Answering Point (PSAP) varies depending on the country of usage of the Teams user.

For more information about emergency calling, including information about emergency addresses and emergency call routing, information specific to countries, and information about network settings and network topology, see the following:

- Manage emergency calling
- Manage network settings for cloud voice features
- Manage your network topology for cloud voice features

Supported clients

The following clients are currently supported. Check back often to see updates to this list.

- Teams desktop client for Microsoft Windows
- Teams desktop client for Apple macOS
- Teams mobile client for Apple iOS client version 1.0.92.2019121004 and App Store version 1.0.92 and greater
- Teams mobile client for Android client and Google Play store version 1416/1.0.0.2019121201 and greater
- Teams phone version 1449/1.0.94.2019110802 and greater
- Teams Rooms version 4.4.25.0 and greater

> **NOTE**
>
> Dynamic emergency calling including security desk notification isn't supported on the Teams web client. To prevent users from using the Teams web client to call PSTN numbers, you can set a Teams calling policy and turn off the **Allow web PSTN calling** setting. To learn more, see Calling policies in Teams and Set-CsTeamsCallingPolicy.

Assign emergency addresses

You can assign emergency addresses to both Calling Plan users and to the network identifiers that are required for dynamically obtaining a location. (Subnet and WiFi AP are supported. Ethernet switch/port is supported on Windows 8.1 and later at this time).

To support automated routing of emergency calls within the United States, you must ensure that the emergency locations that are assigned to network identifiers include the associated geo codes. (Emergency addresses without geo codes can't be assigned to the network identifiers that are required for dynamic locations.)

Azure Maps is used for location-based services. When you enter an emergency address by using the Microsoft Teams admin center, Teams checks Azure Maps for the address:

- If a match is found, the geo codes are automatically included.
- If a match isn't found, you will have the opportunity to manually create an emergency address. You can use the PIN drop feature to do this.

This means that if an existing emergency location that is created for assigning to Calling Plan users is intended for a dynamic location, the same address needs to be re-created to include the geo codes. To distinguish between the two locations, you should include a different description. The new emergency location can be assigned to the users who have the old location. When fully migrated, the old location can be deleted.

You add and assign emergency addresses in the Microsoft Teams admin center or by using PowerShell. For more information, see Add an emergency location for your organization and Assign an emergency location for a user.

Configure network settings

Network settings are used to determine the location of a Teams client, and to dynamically obtain emergency calling policies and an emergency location. You can configure network settings according to how your organization wants emergency calling to function.

Network settings include sites that include a collection of subnets and these are used exclusively for dynamic policy assignment to users. For example, an emergency calling policy and an emergency call routing policy might be assigned to the "Redmond site" so that any user that roams from home or another Microsoft location is configured with emergency numbers, routing, and security desk specific to Redmond.

> **NOTE**
> Subnets can also be defined in LIS and can be associated with an emergency location.

Keep the following definitions in mind. For more information, see Network settings for cloud voice features.

- Trusted IP addresses contain a collection of the internet external IP addresses of the enterprise network and are used to determine if the user's endpoint is inside the corporate network. An attempt to obtain a dynamic policy or location will only be made if the user's external IP address matches an IP address in the trusted IP address. A match can be made against either IPv4 or IPv6 IP addresses and is dependent upon the format of the IP packet sent to the network settings. (If a public IP address has both IPv4 and IPv6, you need to add both as trusted IP addresses.)
- A network region contains a collection of network sites.
- A network site represents a location where your organization has a physical value, such as an office, a set of buildings, or a campus. These sites are defined as a collection of IP subnets.
- A network subnet must be associated with a specific network site. A client's location is determined based on the network subnet and the associated network site.

You configure network settings in the Microsoft Teams admin center or by using PowerShell. To learn more, see Manage your network topology for cloud voice features.

Note that it can take some time (up to a couple of hours) for some changes to network settings (such as a new address, network identifier, and so on) to propagate and be available to Teams clients.

For Calling Plan users:

- If dynamic configuration of security desk notification is required, you must configure both trusted IP addresses and network sites.
- If only dynamic locations are required, you must configure only trusted IP addresses.
- If neither are required, configuring network settings isn't required.

For Direct Routing users:

- If dynamic enablement of emergency calling or dynamic configuration of security desk notification is required, then you must configure both Trusted IP addresses and network sites.
- If only dynamic locations are required, you must configure only trusted IP addresses.
- If neither are required, configuring network settings isn't required.

Configure Location Information Service

A Teams client obtains emergency addresses from the locations associated with different network identifiers. Both

subnets and wireless access points (WAPs) are supported. Ethernet switch/port is supported on Windows 8.1 and later at this time.

For a client to obtain a location, you must populate the LIS with network identifiers (subnets, WAPs, switches, ports) and emergency locations. You can do this in the Microsoft Teams admin center or by using PowerShell.

Using the Microsoft Teams admin center

1. In the left navigation, go to **Locations** > **Networks & locations**.
2. Click the tab that represents the network identifier that you want to add. For example, click **Subnets**, **Wi-Fi access points**, **Switches**, or **Ports**. Then click **Add**.
3. Complete the fields, add an emergency location, and then click **Apply**.

Using PowerShell

Use the following cmdlets to add ports, switches, subnets, and WAPs to the LIS.

- Get, Set, Remove -CsOnlineLisSubnet
- Get, Set, Remove -CsOnlineLisPort
- Get, Set, Remove -CsOnlineLisWirelessAccessPoint
- Get, Set, Remove -CsOnlineLisSwitch

> **IMPORTANT**
> If subnets are being used as part of network sites, they must be redefined in the Location Information Service to render dynamic locations.

Configure emergency policies

Use the following policies to configure emergency calling. You can manage these policies in the Microsoft Teams admin center or by using PowerShell.

- **Emergency call routing policy** – Applies only to Direct Routing. This policy configures the emergency numbers, masks per number if desired, and the PSTN route per number. You can assign this policy to users, to network sites, or to both. (Calling Plans Teams clients are automatically enabled for emergency calling with the emergency numbers from the country based upon their Microsoft 365 or Office 365 usage location.) To learn more, see Manage emergency call routing policies for Direct Routing.
- **Emergency calling policy** - Applies to Calling Plans and Direct Routing. This policy configures the security desk notification experience when an emergency call is made. You can set who to notify and how they are notified. For example, to automatically notify your organization's security desk and have them listen in on emergency calls. This policy can either be assigned to users or network sites or both. To learn more, see Manage emergency calling policies in Teams.

Enable users and sites

You can assign emergency call routing policies and emergency calling policies to users and to sites. Keep in mind that emergency call routing policies apply to Direct Routing only. (Although it's possible to assign this policy to a Calling Plan user, the policy will have no effect.)

You assign policies in the Microsoft Teams admin center or by using PowerShell. To learn more, see:

- Manage emergency call routing policies for Direct Routing
- Manage emergency calling policies in Teams

Here's some PowerShell examples.

To enable a specific user for security desk notification, use the following command:

```
Grant-CsTeamsEmergencyCallingPolicy -Identity user1 -PolicyName SecurityDeskNotification
```

To assign a policy called "Contoso Emergency Calling Policy 1" to Site 1, use the following command:

```
Set-CsTenantNetworkSite -identity "site1" -EmergencyCallingPolicy "Contoso Emergency Calling Policy 1"
```

To enable a specific Direct Routing user for emergency calling, use the following command:

```
Grant-CsTeamsEmergencyCallRoutingPolicy -Identity user1 -PolicyName UnitedStates
```

To assign a policy called "Contoso New York Emergency Call Routing" to Site 1, use the following command:

```
Set-CsTenantNetworkSite -identity "site1" -EmergencyCallRoutingPolicy "Contoso New York Emergency Call
Routing"
```

If you assigned an emergency calling policy to a network site and to a user, and if that user is at that network site, the policy that's assigned to the network site overrides the policy that's assigned to the user.

Test emergency calling

Some Emergency Routing Service Providers (ERSPs) in the United States offer an emergency calling test bot.

- **Calling Plan users in the United States** can use the predefined test emergency number 933 to validate their emergency calling configuration. This number is routed to a bot, which then echoes back the caller phone number (calling line ID), emergency address or location, and whether the call would be automatically routed to the PSAP or screened first.
- **Direct Routing customers in the United States** should coordinate with their ERSP for a test service.

Related topics

- Manage emergency calling
- Manage emergency calling policies
- Manage emergency call routing policies
- Add, change, or remove an emergency location for your organization
- Assign or change an emergency location for your user
- Network settings for cloud voice features
- Manage your network topology for cloud voice features

Add, change, or remove an emergency location for your organization

8/17/2020 • 2 minutes to read • Edit Online

An emergency location must be associated with a phone number, but when this happens can vary between countries and regions. For example, in the United States, you need to associate an emergency location when you assign the phone number to the user. In the United Kingdom, you need to associate an emergency location to the phone number when you get the phone numbers from Microsoft 365 or Office 365 or transfer phone numbers from your current service provider.

No matter which country or region you are in, you can add a place or places to an emergency location and remove an emergency location. Depending on the number of physical locations in your organization, you can create places for buildings, floors, and offices. See Manage emergency calling.

To learn how to get a Calling Plan and how much they cost, see Teams add-on licensing.

You manage emergency locations for your organization in the Microsoft Teams admin center or by using PowerShell.

Add an emergency location

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Emergency addresses**.
2. Click **Add**.
3. Enter a name and description for the location.
4. Select the country or region, and then enter the address.

> **NOTE**
> In Belgium, France, Germany, Ireland, Netherlands, and Spain, it's important to understand that to successfully activate a phone number in Microsoft 365 or Office 365, the address set up in the emergency location, which is used to acquire the number, must match the phone number's area code.

5. If the address isn't found and you want to manually edit the address, turn on **Edit the address manually**.
6. Click **Save**.

Using PowerShell

See New-CsOnlineLisCivicAddress.

Change an emergency location

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Emergency addresses**.
2. In the list, select the location that you want to change, and then click **Edit**.
3. Make the changes you want.
4. Click **Save**.

> **NOTE**
>
> You can change the address information for a location only if the address isn't validated. If the address is already validated, and you need to change the address, delete the location, and then create a new location with the correct address.

Using PowerShell

See Set-CsOnlineLisCivicAddress.

Remove an emergency location

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Emergency addresses**.
2. In the list, select the location that you want to remove, and then click **Delete**.

Using PowerShell

See Remove-CsOnlineLisCivicAddress.

Related topics

- Manage emergency calling
- Add, change, or remove a place for an emergency location in your organization
- Manage phone numbers for your organization
- Emergency calling terms and conditions

Add, change, or remove a place for an emergency location in your organization

6/3/2020 • 2 minutes to read • Edit Online

Depending on the number of physical locations in your organization, you can add places for buildings, floors, and offices to create a more specific emergency location. See Manage emergency calling for more information.

To learn how to get a Calling Plan and how much they cost, see Teams add-on licensing.

You manage emergency locations for your organization in the Microsoft Teams admin center or by using PowerShell.

Add a place to an emergency location

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Emergency addresses**.
2. In the list, click the name of the location for which you want to add a place.
3. On the **Places** tab, click **Add**.
4. Enter a place name, and then click **Apply**.

Using PowerShell

See New-CsOnlineLisLocation.

Change a place for an emergency location

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Emergency addresses**.
2. In the list, click the name of the location for which you want to change a place.
3. On the **Places** tab, select the place you want to change, and then click **Edit**.
4. Update the place information, and then click **Apply**.

Using PowerShell

See Set-CsOnlineLisLocation.

Remove a place from an emergency location

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Locations** > **Emergency addresses**.
2. In the list, click the name of the location for which you want to remove a place.
3. On the **Places** tab, select the place you want to remove, and then click **Delete**.

Using PowerShell

See Remove-CsOnlineLisLocation.

Related topics

- Add, change, or remove a place for an emergency location in your organization
- Manage phone numbers for your organization

- Emergency calling terms and conditions

Assign or change an emergency location for a user

8/17/2020 • 2 minutes to read • Edit Online

When you're setting up Calling Plans, you need to assign an emergency location to each phone number or user. In European countries, the emergency location is associated with the phone number when you get it from Microsoft 365 or Office 365 or when you transfer a phone number over to Microsoft 365 or Office 365. In the United States, the emergency location is associated with the phone number when it's assigned to the user. The emergency address can be changed if the user that it's assigned to moves to a new location. For more about emergency addresses and locations, see What are emergency locations, places, and call routing?.

To learn how to get a Calling Plans and how much they cost, see Teams add-on licensing.

You can assign or change an emergency location for a user in the Microsoft Teams admin center or by using PowerShell.

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Voice** > **Phone numbers**.
2. On the **Phone numbers** page, click the **Numbers** tab, select a user number in the list, and then click **Edit**.
3. On the **Edit** pane, under **Emergency location**, do one of the following:
   - To assign an emergency location, search for, and select an emergency location.
   - To change the emergency location that's already assigned to the user, click **X** to remove the existing location, and then search for and select the location you want to assign.
4. Depending on whether you want to send an email to the user with their phone number information, turn off or turn on **Email user with telephone number information**. By default, this is on.
5. Click **Apply**.

Using PowerShell

See Set-CsOnlineVoiceUser.

Related topics

- Manage emergency calling
- Add, change, or remove an emergency location for your organization
- Add, change, or remove a place for an emergency location in your organization
- Assign or change a place for an emergency location for a user
- Manage phone numbers for your organization
- Emergency calling terms and conditions
- Teams PowerShell overview

Assign or change the place for an emergency location for a user

6/3/2020 • 2 minutes to read • Edit Online

Each active phone number must have an associated emergency location when you assign the phone number to a user. (You associate the address when you get a phone number in Office 365 or when you transfer a phone number.) When you associate the number with an emergency location, you can also add a place to provide a more exact location within a physical location. A place can be the floor, building wing, or office number where the user is located. You can have an unlimited number of places for a given emergency location, and you can change the place if the user moves to a different office or building. For example, if the user moves from floor 34 to floor 35.

To learn how to get Calling Plans and how much they cost, see Teams add-on licensing.

You can assign or change the place for an emergency location for a user in the Microsoft Teams admin center or by using PowerShell.

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, click **Voice** > **Phone numbers**.
2. On the **Phone numbers** page, click the **Numbers** tab, select a user number in the list, and then click **Edit**.
3. On the **Edit** pane, under **Emergency location**, do one of the following:
   - To assign a place, search for the location or place, and then select the place in the search results.
   - To change the place that's already assigned to the user, click **X** to remove the existing location and place, search for and then select the place you want to assign.
4. Depending on whether you want to send an email to the user with their phone number information, turn off or turn on **Email user with telephone number information**. By default, this is on.
5. Click **Apply**.

Using PowerShell

See Set-CsOnlineLisLocation.

Related topics

- Manage emergency calling
- Add, change, or remove an emergency location for your organization
- Add, change, or remove a place for an emergency location in your organization
- Assign or change an emergency location for a user
- Manage phone numbers for your organization
- Emergency calling terms and conditions

Emergency Calling Labels

6/10/2020 • 2 minutes to read • Edit Online

These are emergency calling (911) disclaimer labels or stickers for use with Avery 5160 address labels (1" x 2 5/8") or can be sized if you want to use other types of labels.

Click to download a .zip file for Emergency Calling labels (en-us).

Related topics

Different kinds of phone numbers used for Calling Plans

Emergency calling terms and conditions

Manage emergency calling policies in Microsoft Teams

9/22/2020 • 3 minutes to read • Edit Online

If your organization uses Calling Plans or deployed Phone System Direct Routing, you can use emergency calling policies in Microsoft Teams to define what happens when a Teams user in your organization makes an emergency call. You can set who to notify and how they are notified when a user who is assigned the policy calls emergency services. For example, you can configure policy settings to automatically notify your organization's security desk and have them listen in emergency calls.

You manage emergency calling policies by going to **Voice** > **Emergency policies** in the Microsoft Teams admin center or by using Windows PowerShell. The policies can be assigned to users and network sites.

For users, you can use the global (Org-wide default) policy or create and assign custom policies. Users will automatically get the global policy unless you create and assign a custom policy. Keep in mind that you can edit the settings in the global policy but you can't rename or delete it. For network sites, you create and assign custom policies.

If you assigned an emergency calling policy to a network site and to a user and if that user is at that network site, the policy that's assigned to the network site overrides the policy that's assigned to the user.

Create a custom emergency calling policy

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Emergency policies**, and then click the **Calling policies** tab.
2. Click **Add**.
3. Enter a name and description for the policy.
4. Set how you want to notify people in your organization, typically the security desk, when an emergency call is made. To do this, under **Notification mode**, select one of the following:
   - **Send notification only**: A Teams chat message is sent to the users and groups that you specify.
   - **Conferenced in but are muted**: A Teams chat message is sent to the users and groups that you specify and they can listen (but not participate) in the conversation between the caller and the PSAP operator.
   - **Conferenced in and are unmuted (coming soon)**: A Teams chat message is sent to the users and groups that you specify and they can unmute to listen and participate in the conversation between the caller and the PSAP operator.
5. If you selected the **Conferenced in but are muted** notification mode, in the **Numbers to dial for emergency calls notifications** box, you can enter a PSTN phone number of a user or group to call and join the emergency call. For example, enter the number of your organization's security desk, who will receive a call when an emergency call is made and can then listen in on the call.
6. Search for and select one or more users or groups, such as your organization's security desk, to notify when an emergency call is made. The notification can be sent to email addresses of users, distribution groups, and security groups. A maximum of 50 users can be notified.
7. Click **Apply**.

Using PowerShell

See New-CsTeamsEmergencyCallingPolicy.

Edit an emergency calling policy

Using the Microsoft Teams admin center

You can edit the global policy or any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Emergency policies**, and then click the **Calling policies** tab.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. Make the changes that you want, and then click **Apply**.

Using PowerShell

See Set-CsTeamsEmergencyCallingPolicy.

Assign a custom emergency calling policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

See also Grant-CsTeamsEmergencyCallingPolicy.

Assign a custom emergency calling policy to a network site

Use the Set-CsTenantNetworkSite cmdlet to assign an emergency calling policy to a network site.

The following example shows how to assign a policy called Contoso Emergency Calling Policy 1 to the Site1 site.

```
Set-CsTenantNetworkSite -identity "site1" -EmergencyCallingPolicy "Contoso Emergency Calling Policy 1"
```

Related topics

Manage emergency call routing policies in Teams

Teams PowerShell overview

Assign policies to your users in Teams

Manage emergency call routing policies in Microsoft Teams

11/2/2020 • 4 minutes to read • Edit Online

If you've deployed Phone System Direct Routing in your organization, you can use emergency call routing policies in Microsoft Teams to set up emergency numbers and specify how emergency calls are routed. An emergency call routing policy determines whether enhanced emergency services is enabled for users who are assigned the policy, the numbers used to call emergency services (for example, 911 in the United States), and how calls to emergency services are routed.

You manage emergency call routing policies by going to **Voice** > **Emergency policies** in the Microsoft Teams admin center or by using Windows PowerShell. The policies can be assigned to users and network sites.

For users, you can use the global (Org-wide default) policy or create and assign custom policies. Users will automatically get the global policy unless you create and assign a custom policy. Keep in mind that you can edit the settings in the global policy but you can't rename or delete it. For network sites, you create and assign custom policies.

If you assigned an emergency call routing policy to a network site and to a user and if that user is at that network site, the policy that's assigned to the network site overrides the policy that's assigned to the user.

Create a custom emergency call routing policy

Using the Microsoft Teams admin center

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Emergency policies**, and then click the **Call routing policies** tab.
2. Click **Add**.
3. Enter a name and description for the policy.
4. To enable dynamic emergency calling, turn on **Dynamic emergency calling**. When dynamic emergency calling is enabled, Teams retrieves policy and location information from the service and includes that information as part of the emergency call.
5. Define one or more emergency numbers. To do this, under **Emergency numbers**, click **Add**, and then do the following:

   a. **Emergency dial string**: Enter the emergency dial string. This dial string indicates that a call is an emergency call.

   > **NOTE**
   > For Direct Routing, we're transitioning away from Teams clients sending emergency calls with a "+" in front of the emergency dial string. Until the transition is completed, the voice route pattern to match an emergency dial string should ensure a match is made for strings that have and don't have a preceding "+", such as 911 and +911. For example, ^\+?911 or .*.

   b. **Emergency dial mask**: For each emergency number, you can specify zero or more emergency dial masks. A dial mask is the number that you want to translate into the value of the emergency dial string. This allows for alternate emergency numbers to be dialed and still have the call reach emergency

services.

For example, you add 112 as the emergency dial mask, which is the emergency service number for most of Europe, and 911 as the emergency dial string. A Teams user from Europe who is visiting may not know that 911 is the emergency number in the United States, and when they dial 112, the call is made to 911. To define multiple dial masks, separate each value by a semicolon. For example, 112;212.

c. **PSTN usage record**: Select the Public Switched Telephone Network (PSTN) usage record. The PSTN usage record is used to determine which route is used to route emergency calls from users who are authorized to use them. The route associated with this usage should point to a Session Initiation Protocol (SIP) trunk dedicated to emergency calls or to an Emergency Location Identification Number (ELIN) gateway that routes emergency calls to the nearest Public Safety Answering Point (PSAP).

> **NOTE**
>
> Dial strings and dial masks must be unique within a policy. This means that for a policy, you can define multiple emergency numbers and you can set multiple dial masks for a dial string, but each dial string and dial mask must only be used one time.

6. Click **Save**.

Using PowerShell

See New-CsTeamsEmergencyCallRoutingPolicy.

Edit an emergency call routing policy

Using the Microsoft Teams admin center

You can edit the global policy or any custom policies that you create.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Emergency policies**, and then click the **Call routing policies** tab.
2. Select the policy by clicking to the left of the policy name, and then click **Edit**.
3. Make the changes that you want, and then click **Save**.

Using PowerShell

See Set-CsTeamsEmergencyCallRoutingPolicy.

Assign a custom emergency call routing policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

See also Grant-CsTeamsEmergencyCallRoutingPolicy.

Assign a custom emergency call routing policy to a network site

Use the Set-CsTenantNetworkSite cmdlet to assign an emergency calling routing policy to a network site.

This example shows how to assign a policy called Emergency Call Routing Policy 1 to the Site1 site.

```
Set-CsTenantNetworkSite -identity "site1" -EmergencyCallRoutingPolicy "Emergency Call Routing Policy 1"
```

Related topics

Manage emergency calling policies in Teams

Teams PowerShell overview

Assign policies to your users in Teams

Contoso case study: Teams voice migration overview

6/17/2020 • 2 minutes to read • Edit Online

This article introduces a case study for how a fictional multi-national corporation, Contoso, implemented a Teams voice solution for their organization.

Contoso has deployed Microsoft 365 Enterprise and addressed major design decisions and implementation details for the following: networking, identity, Windows 10 Enterprise, Office 365 ProPlus, mobile device management, information protection, security, upgrade from Skype for Business to Teams, Phone System, and Audio Conferencing.

This article focuses on how Contoso migrated their on-premises users to Teams for unified communication, collaboration, and voice. For background information about how Contoso accelerated their digital transformation by using Microsoft's cloud services, see all the core articles starting with the Contoso case study overview.

https://docs.microsoft.com/microsoft-365/enterprise/contoso-case-study?view=o365-worldwide

In the core articles, you'll find information on the following:

- Contoso's IT infrastructure needs
- Networking
- Identity
- Windows 10 Enterprise
- Office 365 Pro Plus
- Mobile device management
- Information protection
- Summary of Microsoft 365 Enterprise security
- Team for a top-secret project
- SharePoint Online site for highly confidential digital assets

For information about planning an upgrade, you'll want to start with Getting started with your Microsoft Teams upgrade.

Contoso business goals for Teams

To migrate their on-premises users to Teams for unified communication, collaboration, and voice, Contoso decided on the following business goals:

- Teams enablement

  Contoso's unified communication and collaboration team enabled Teams with the correct policies to govern and enable secure internal and external collaboration.

- Skype for Business to Teams upgrade

  Skype for Business was widely deployed within Contoso. With the need to move off legacy systems, Contoso decided to upgrade their Skype for Business users to Teams. For more information, see Contoso case study: Teams upgrade plan.

- Phone System

  Skype for Business with enterprise voice was widely deployed within Contoso. With the need to move off legacy systems that were the next hop for their mediation servers, Contoso migrated their Skype for

Business enterprise voice users to Phone System. Contoso sites used Microsoft Calling Plan, Phone System Direct Routing, or a combination of both. For more information, see Contoso case study: Phone System.

- Location-Based Routing

  With office locations in telephony-regulated countries, Contoso needed to recreate the Location-Based Routing that was present in Skype for Business in their Phone System deployment. For more information, see Contoso case study: Location-Based Routing.

- Emergency Calling

  Where Direct Routing was implemented, Contoso set up emergency calling with approved third parties. For more information, see Contoso case study: Emergency Calling.

- Audio Conferencing

  Contoso set up Audio Conferencing service numbers that were hosted on their SIP trunk to their PSTN provider. For more information, see Contoso case study: Audio Conferencing.

- Local Media Optimization

  Contoso took advantage of Local Media Optimization in locations where they had one direct route trunk to Microsoft Phone System that was leveraged by remote sites. For more information, see Plan for Local Media Optimization and Configure Local Media Optimization.

- Auto Attendants and Call Queues

  As a result of Covid-19, Contoso wanted to provide receptionist support while their staff was working remotely. Contoso used auto attendants and call queues to manage incoming calls to their receptionist's phone number. For more information, see Contoso case study: Auto Attendants and Call Queues.

Contoso case study: Teams upgrade plan

6/17/2020 • 2 minutes to read • Edit Online

In the decision to migrate from Skype for Business to Teams, Contoso wanted to provide an easy transition experience for end users. Instead of switching everyone to Teams at the same time, they decided to set up hybrid connectivity, and use the overlapping capabilities method to move users to Teams. This allowed users in Teams and Skype for Business on-premises to share presence and communicate. As users entered the pilot for Phone System, they were moved to Teams Only mode.

To understand fundamental concepts about upgrade, methods, and modes, Contoso read the following articles:

- Getting started with your Microsoft Teams upgrade
- Upgrade from Skype for Business to Teams
- Migration and interoperability guidance

Contoso also attended the Ignite 2019 session Designing your path from Skype for Business to Teams. Contoso learned about:

- Fundamental concepts such as interoperability, federation, and upgrade behavior
- Coexistence modes and management based on TeamsUpgradePolicy
- End user experience for:
    - Chat and Calling
    - Meeting scheduling
    - Availability of collaboration functionality in Teams clients

To plan and configure hybrid connectivity, the first step in moving their on-premises environment to the cloud, Contoso read Plan hybrid connectivity and Configure hybrid connectivity to understand how to:

- Configure their on-premises environment service to federate with Office 365.
- Configure their on-premises environment to trust Office 365 and enable shared SIP address space with Office 365
- Enable shared SIP address space in their Office 365 tenant.
- Use Islands mode during the technical pilot.
- Switch users to TeamsOnly mode once the user is enabled for Phone System. TeamsOnly mode is required for Calling Plan and Direct Routing.

Contoso case study: Phone System

6/17/2020 • 7 minutes to read • Edit Online

Depending on geographic location and other factors, Contoso had offices using the following telephony solutions:

- Site Type A: Skype for Business Enterprise Voice
- Site Type B: Traditional legacy telephony systems
- Site Type C: A combination of Skype for Business Enterprise Voice and traditional legacy telephony systems

To implement a Microsoft Phone System solution for their entire organization, Contoso had to determine—for each site type—which of the following options would be used with Phone System to connect to the Public Switched Telephone Network (PSTN):

- Phone System with Calling Plan
- Phone System with own PSTN carrier through Direct Routing
- Combination of Phone System with Calling Plan and Phone System with own PSTN carrier through Direct Routing

To determine the right solution for their organization, Contoso used Microsoft telephony solutions and the Ignite 2019 session Calling in Microsoft Teams.

Site Type A: Skype for Business Enterprise Voice

Contoso Skype for Business Enterprise Voice was set up as a hub and spoke. There was a central location that maintained the PSTN gateway in the region that provided the connection to the PSTN for the Skype for Business Enterprise Voice users in country. Often these satellite offices did not have their own Internet egress. The numbers for these users resided on the SIP trunk connecting to an existing SBC.

To determine if the SBC already deployed is certified for Direct Routing and Media Bypass, Contoso checked the List of Session Border Controllers certified for Direct Routing.

The user's dialing habits were to dial a user on the legacy telephony system using an extension, even when the user has a Skype for Business client available for peer-to-peer audio.

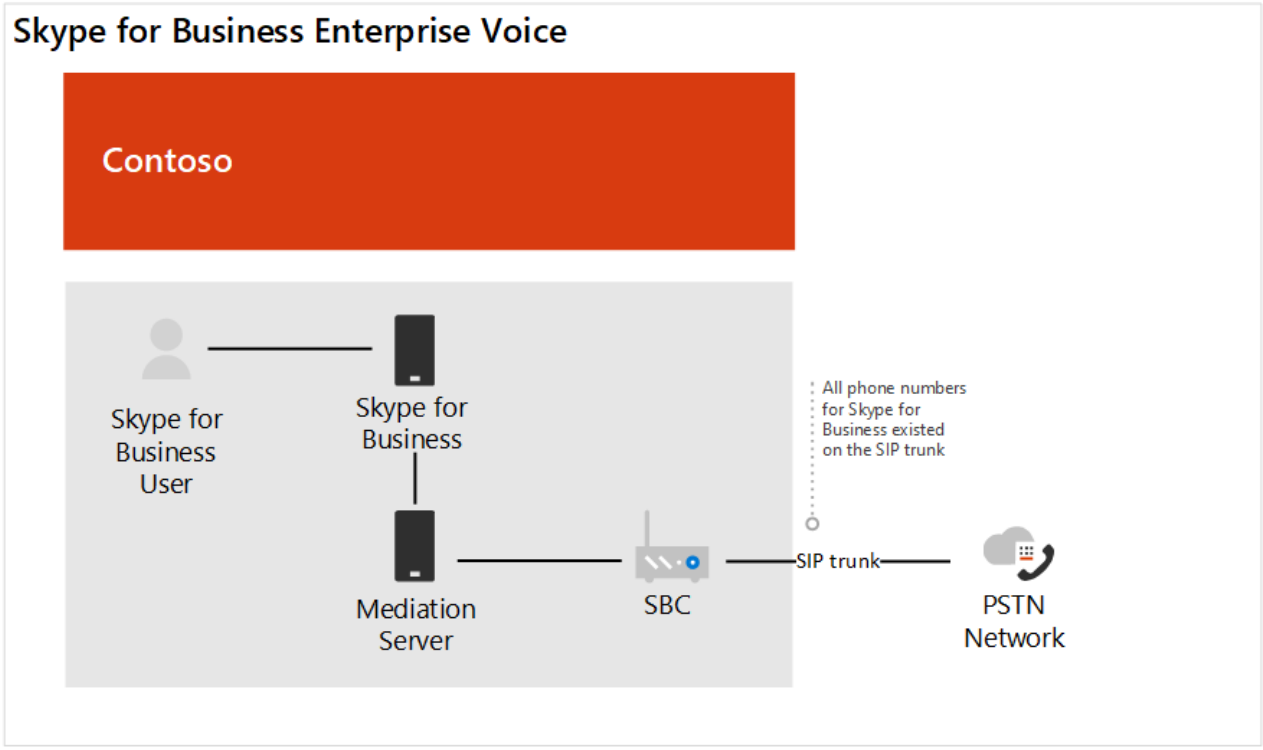
Contoso based their decision on the following questions:

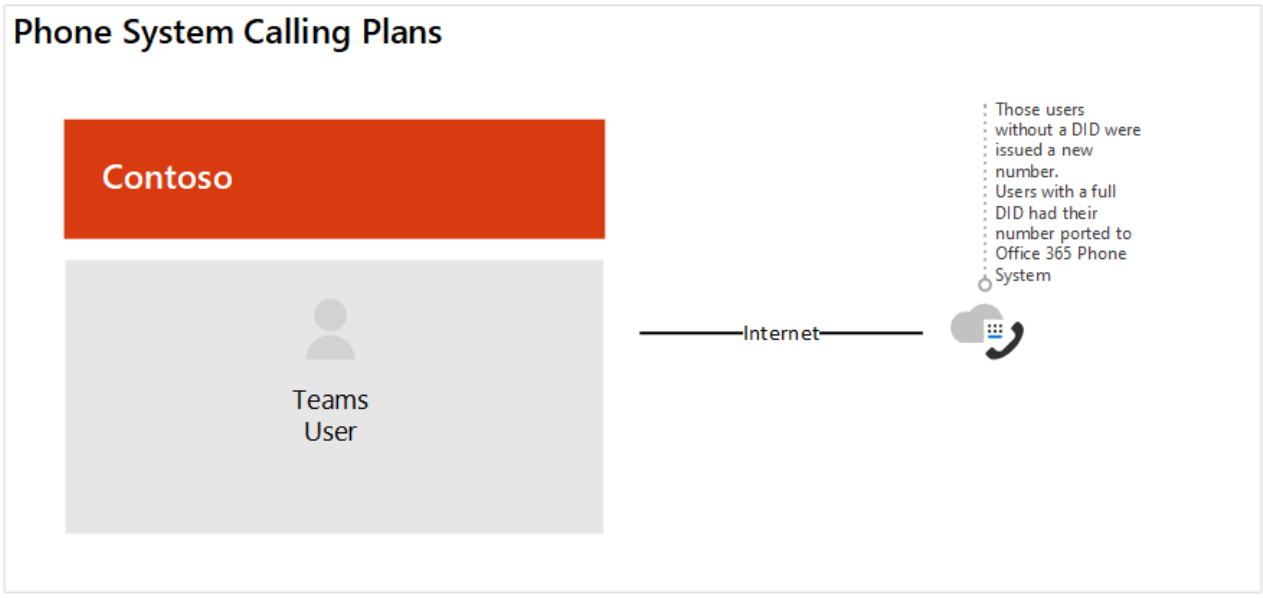
- Q. Do we need to retain functionality provided by our on-premises deployment?
  A. No
- Q. Do we need to interoperate with third-party PBX systems and other telephony equipment?
  A. No
- Q. Do we need to retain our current third-party carrier?
  A. Yes (regulated countries) and No
- Q. Do we need to get the ROI on SBCs deployed?
  A. Yes and No
- Q. Is Microsoft PSTN Calling Plans available in this region?
  A. Yes and No

Based on the answers to their questions, Contoso decided to:

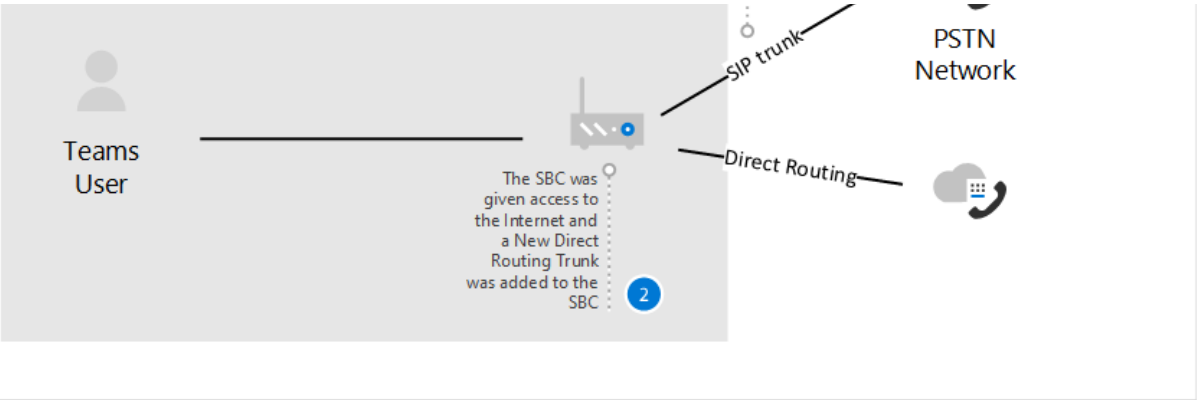
- Move the users that are located in a region where PSTN calling plans is available to Phone System with Calling Plans.
- Move the users that are not located in a region where PSTN calling plans is available, users located in a site where the ROI on the SBCs have yet to be met, and users that resided in a country that has telephony regulations to Phone System with Direct Routing.

The following diagram shows the initial Skype for Business Enterprise Voice deployment and how this deployment was migrated to both Microsoft Calling Plans and Direct Routing:









Site Type B: Traditional legacy telephony systems

Contoso had many offices that leveraged legacy telephony systems. There were a subset of users that had an E1.64 phone number while others only had an extension. These numbers resided on the TDM trunk to the PSTN gateway. Intra-site dialing was configured by leveraging a site code in front of the extension to determine where to route the call. The users' dialing habits were to dial by extension.

Contoso based their decision on the following questions:

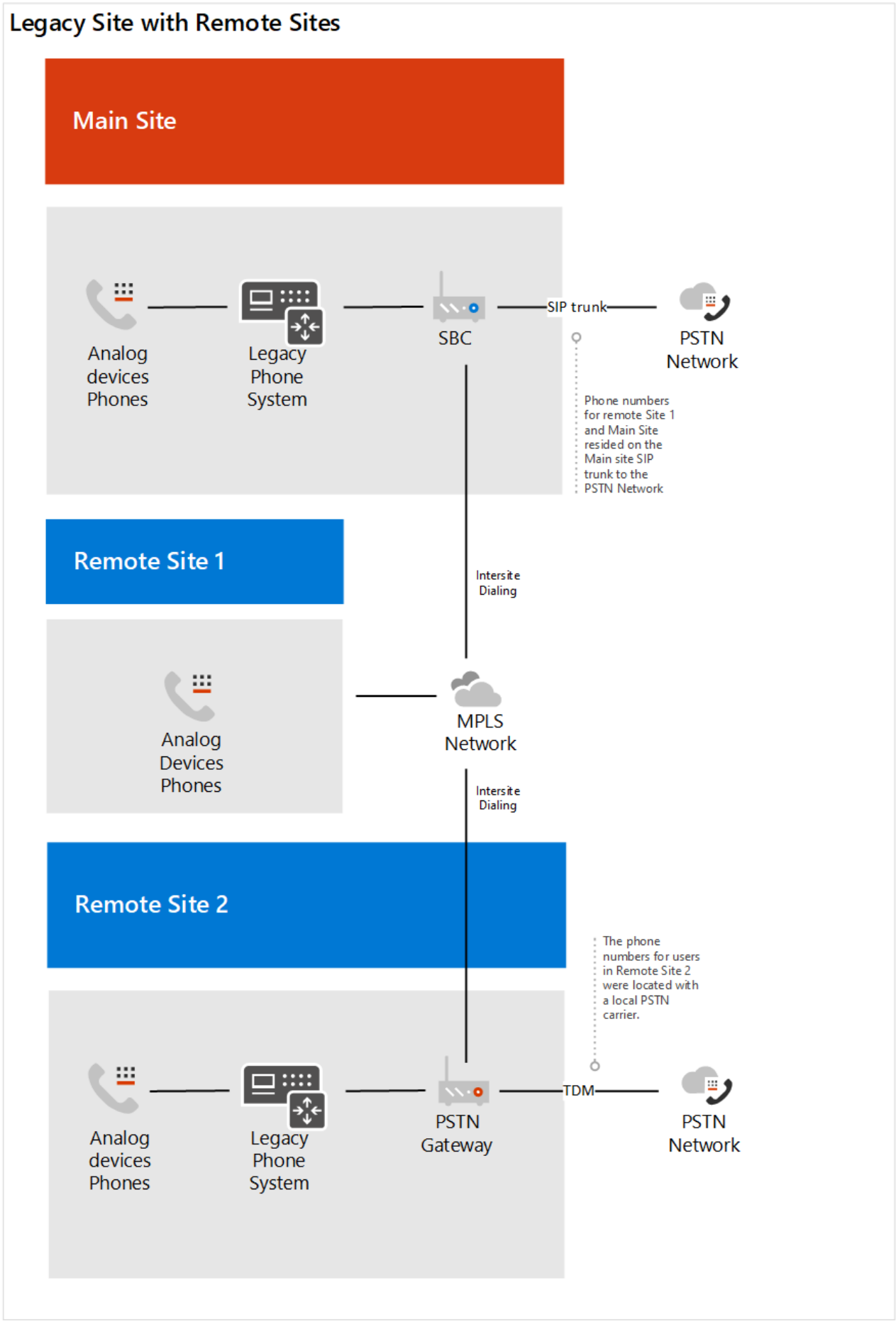
- Q. Do we need to retain functionality provided by our on-premises deployment?
  A. No
- Q. Do we need to interoperate with third-party PBX systems and other telephony equipment?
  A. Yes
- Q. Do we need to retain our current third-party carrier?
  A. No
- Q. Is Microsoft PSTN's Calling Plan available in our region?
  A. Yes and No

Based on the answers to their questions, Contoso decided to:

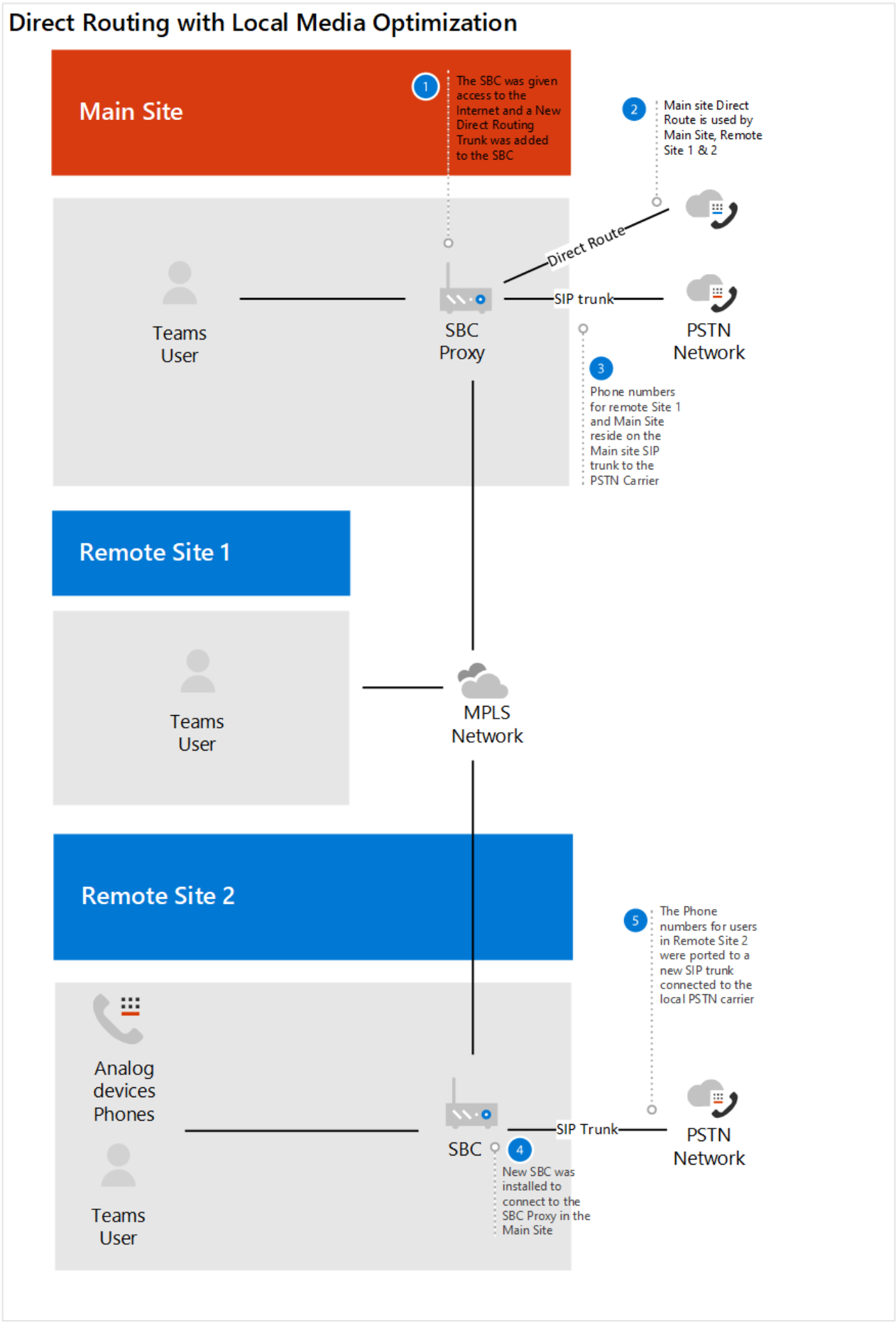
- Move the users that are located in a region where PSTN calling plans is available to Phone System with Calling Plans.
- Move the users that are not located in a region where PSTN calling plans is available to Phone System with Direct Routing.
- Maintain a PSTN connection to business critical analog devices.

The following diagrams show the original legacy system deployment with remote sites and the migration to a Direct Routing deployment with Local Media Optimization:

Original legacy deployment



Deployment with Direct Routing



Site Type C: Combination of Skype for Business Enterprise Voice and traditional legacy telephony systems

Contoso Skype for Business Enterprise Voice users' numbers reside on the SIP trunk to the SBC from the carrier.

The numbers for the traditional telephony systems resided on the TDM trunk to the PSTN gateway.

Contoso based their decision on the following questions:

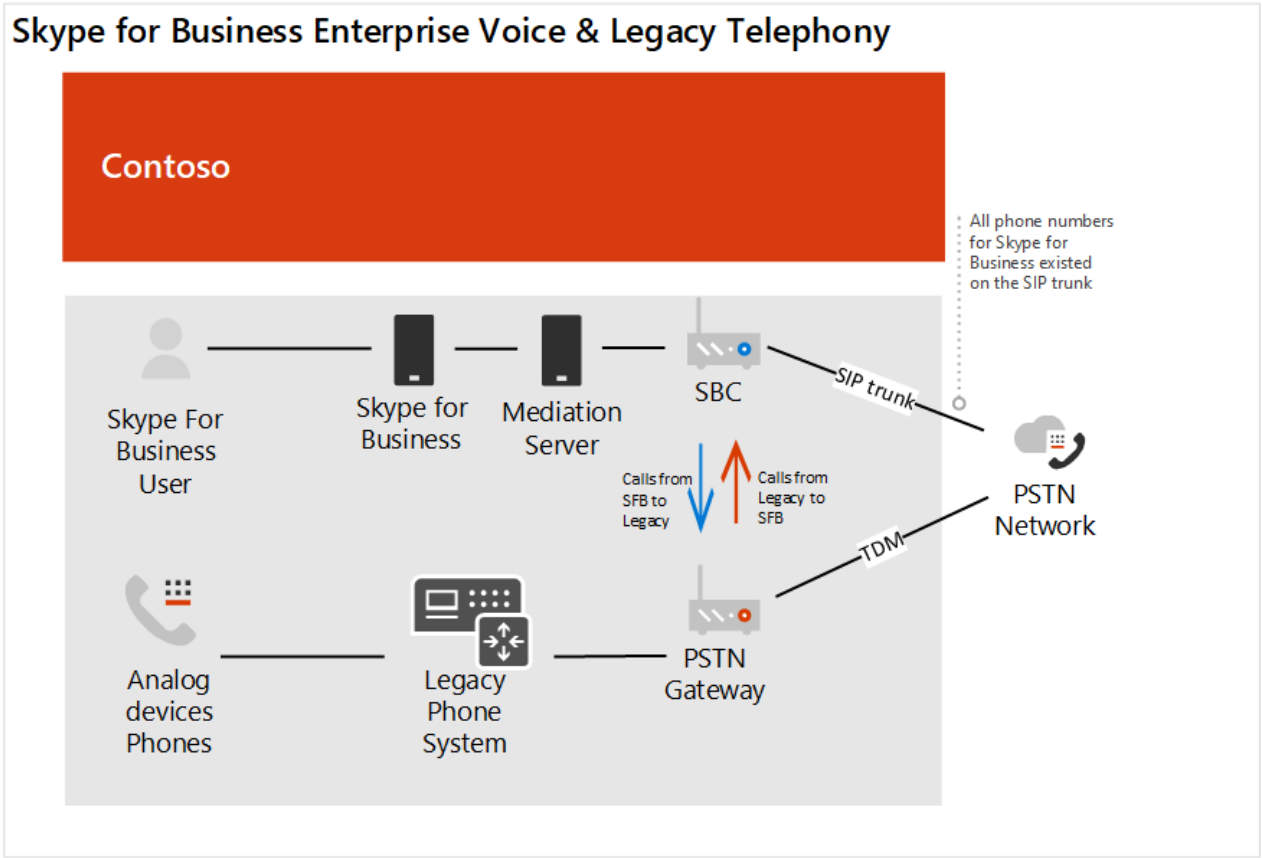
- Q. Do we need to retain functionality provided by our on-premises deployment?
  A. No
- Q. Do we need to interoperate with third-party PBX systems and other telephony equipment?
  A. No
- Q. Do we need to retain our current third-party carrier?
  A. No
- Q. Do we need to get the ROI on SBCs deployed?
  A. Yes and No
- Q. Is Microsoft's PSTN Calling Plan available in this region?
  A. No

Based on the answers to their questions, Contoso decided on the following:

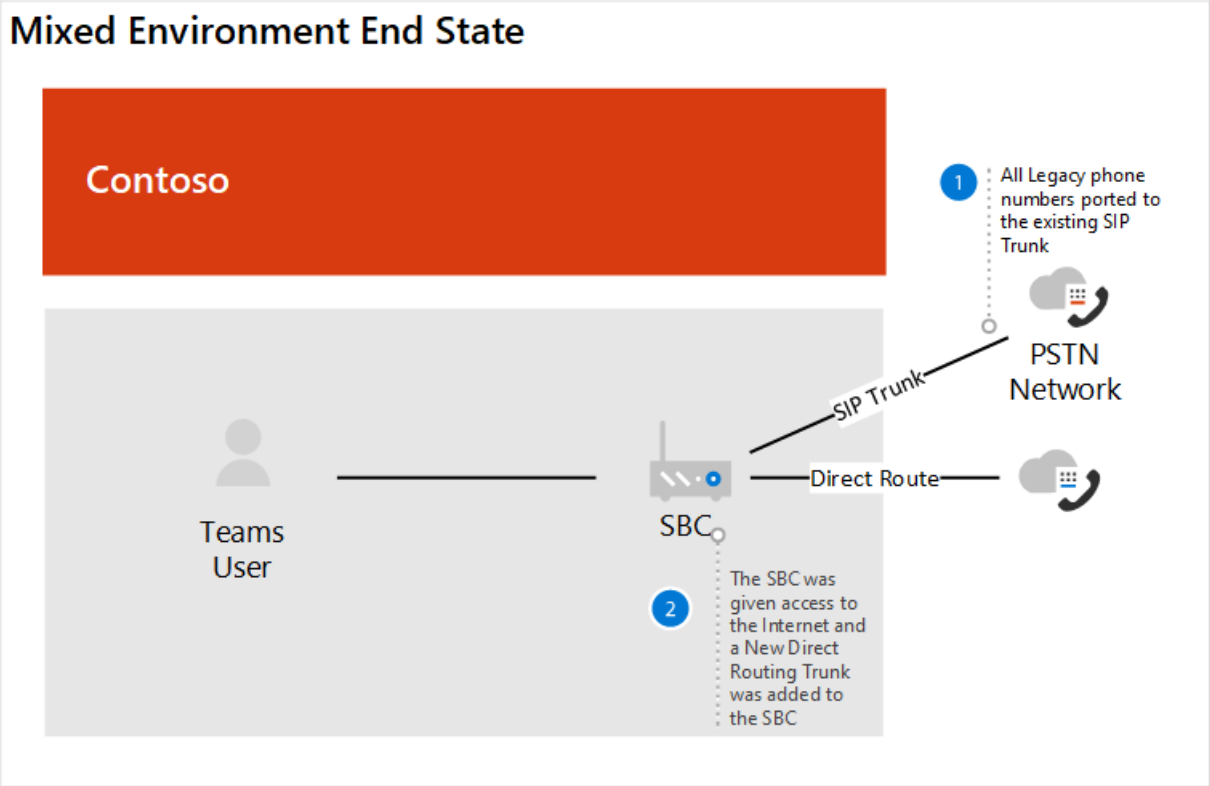
- For the legacy telephony users that will be enabled for Direct Routing, Contoso ported the numbers from the TDM trunk to the SIP Trunk for the SBC, since the SBC is certified for Direct Routing.
- To support a subset of users moving to Phone System and to allow continued routing through the legacy system, the legacy telephony system was set up as the next hop to the SBC.
- In addition, to encourage user behavior change and remove the dependency on inter- and intra-site extension dialing, Contoso provided guidance to use Teams for all internal calls.

The following diagrams show the original Skype for Business Enterprise Voice and legacy telephony system deployment and the migration to a mixed deployment using Direct Routing:

Original mixed deployment



Mixed deployment with Direct Routing



Calling Plans

To determine the configuration requirements for Calling Plans, Contoso reviewed the Calling Plan core deployment decisions. The resulting decisions were made:

- Q. Do my users need international calling?
  A. Yes
- Q. Do my users each have a direct inward DID phone number?
  A. Not today. All users enabled will receive a DID.
- Q. Do I want to mask or disable caller ID?
  A. The caller ID for a user will be masked to the local number for Contoso.

Direct Routing

Contoso attended Ignite to stay current on Office 365 features including those available with Phone system and Direct Routing. Technical leadership and architects used the guidance provided during the Ignite 2019 to determine their direction. Key sessions that were used:

- Plan for success with Microsoft Teams Direct Routing
- Updates for Direct Routing

Configuration

Calling Plans sites

To obtain licenses and assign phone numbers to users, Contoso followed the steps in Set up Calling Plans.

Due to the number of users that needed to be assigned phone numbers, Contoso decided to use PowerShell to assign the phone numbers. To learn how to assign numbers by using PowerShell—in addition to other settings—Contoso used the Teams PowerShell Overview.

Direct Routing sites

To connect Contoso's on-premises telephony infrastructure to Microsoft Teams, Contoso's administrator followed the steps in Configure Direct Routing and reviewed the video Direct Routing in Microsoft Teams for guidance. Contoso also referred to the Direct routing deployment documentation by the certified SBC vendor.

Once Direct Routing was configured between the SBC and Microsoft Phone System, it was necessary for Contoso to test the configuration. To do this, Contoso administrators used the SIP Tester client that was discussed in the Updates for Direct Routing session at Ignite 2019. The SIP Tester client script and documentation was downloaded from the PowerShell script to test Direct Routing Session Border Controller connections.

Local Media Optimization

Contoso saw the opportunity to leverage Local Media Optimization in the different regions across the globe. The supported scenarios for Contoso are described in Local Media Optimization for Direct Routing. The configuration of the local media optimization was completed by following guidance from both the SBC vendor and Microsoft. The configuration steps for Local Media Optimization include:

- Configure the user and SBC sites
- Configure the SBC according to the SBC vendor specification,
- Add external trusted IP addresses to each site used for Local Media Optimization
- Define the network topology
- Define the virtual network topology
- Determine the mode: Always Bypass or Only for local users

Networking considerations

Contoso had a number of users who needed to work remotely for an extended period of time after they were enabled for Phone System. The users used VPN to access certain Line of Business applications. While on VPN, the Phone System users experienced a degradation of call quality.

To resolve the quality issue, Contoso implemented VPN split tunneling, which allowed their Office 365 traffic to traverse the Internet while the connection to the internal apps remained on the VPN. To implement VPN split tunneling, Contoso followed the guidance in Implementing VPN split tunneling for Office 365.

Contoso case study: Location-Based Routing

6/17/2020 • 2 minutes to read • Edit Online

Location-Based Routing (LBR) is a feature that restricts toll bypass based on policy and the user's physical location at the time of placing or receiving a call.

Overview

Contoso has two offices in a country where it is illegal to bypass the Public Switched Telephone Network (PSTN) provider to decrease long-distance calling costs. The main office has an Internet connection that is used by the main office and by the second office. Each office has their own Session Border Controller (SBC) connected to a PSTN carrier.

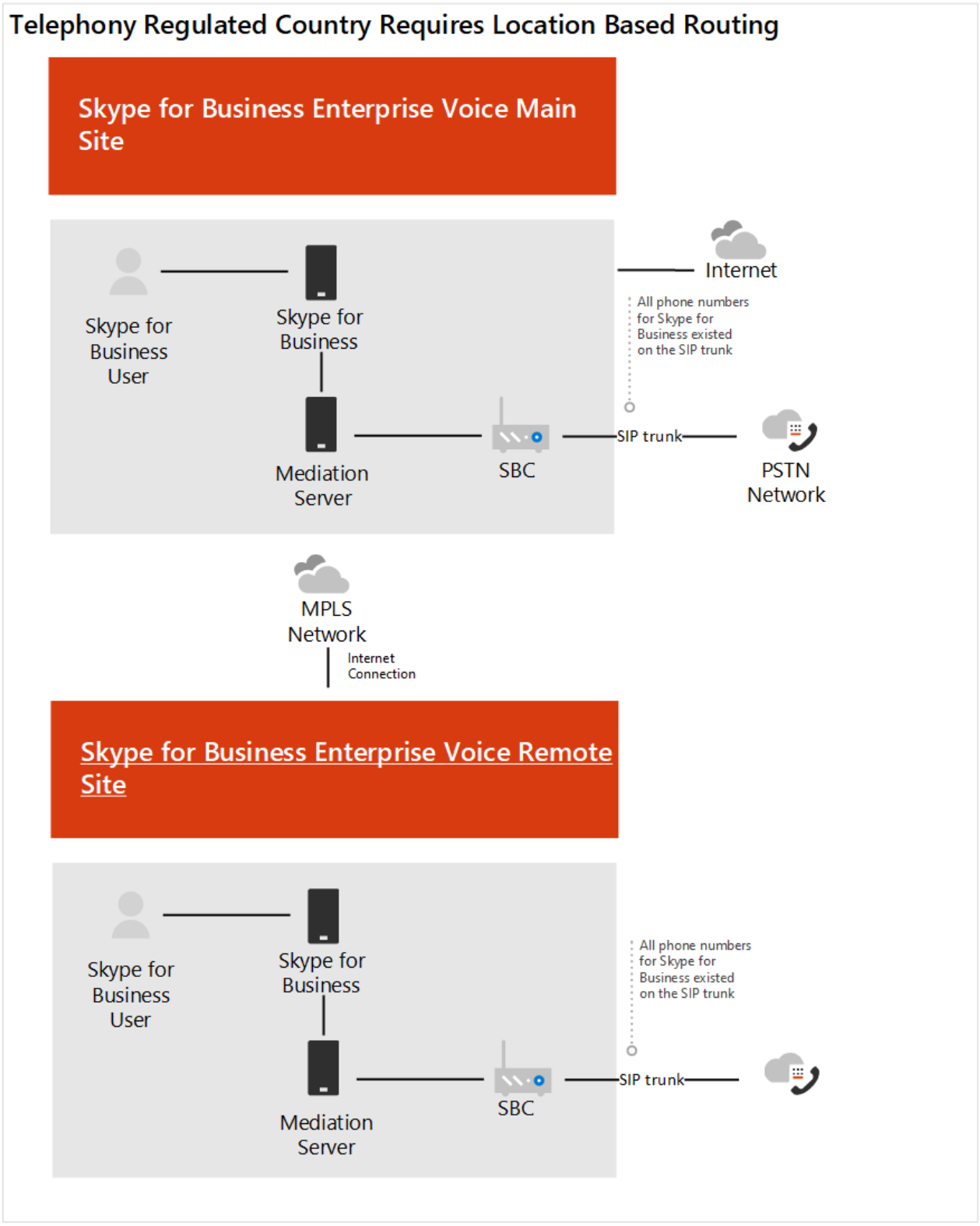
In this country, Contoso had LBR configured for their Skype for Business deployment. To determine how to configure LBR for Teams, Contoso read Plan Location-Based Routing for Direct Routing. Contoso determined that Teams and Skype for Business follow the same scenarios on when a call can be placed, when it can be received, when a PSTN call can be transferred to a Teams user, and when you can transfer another Teams user to the PSTN call.

For Skype for Business, LBR was configured with the Session Border Controller (SBC) SIP Trunk connecting to the PSTN carrier. For this SBC, Contoso reviewed the list of certified SBCs and determined that the SBC deployed is certified for Direct Routing but is not certified for Media Bypass. To support LBR, Direct Routing needs to be configured to the SBC on-site, there needs to be a local Internet egress, and the SBC needs to be configured for Media Bypass. Based on this information, Contoso decided the following:

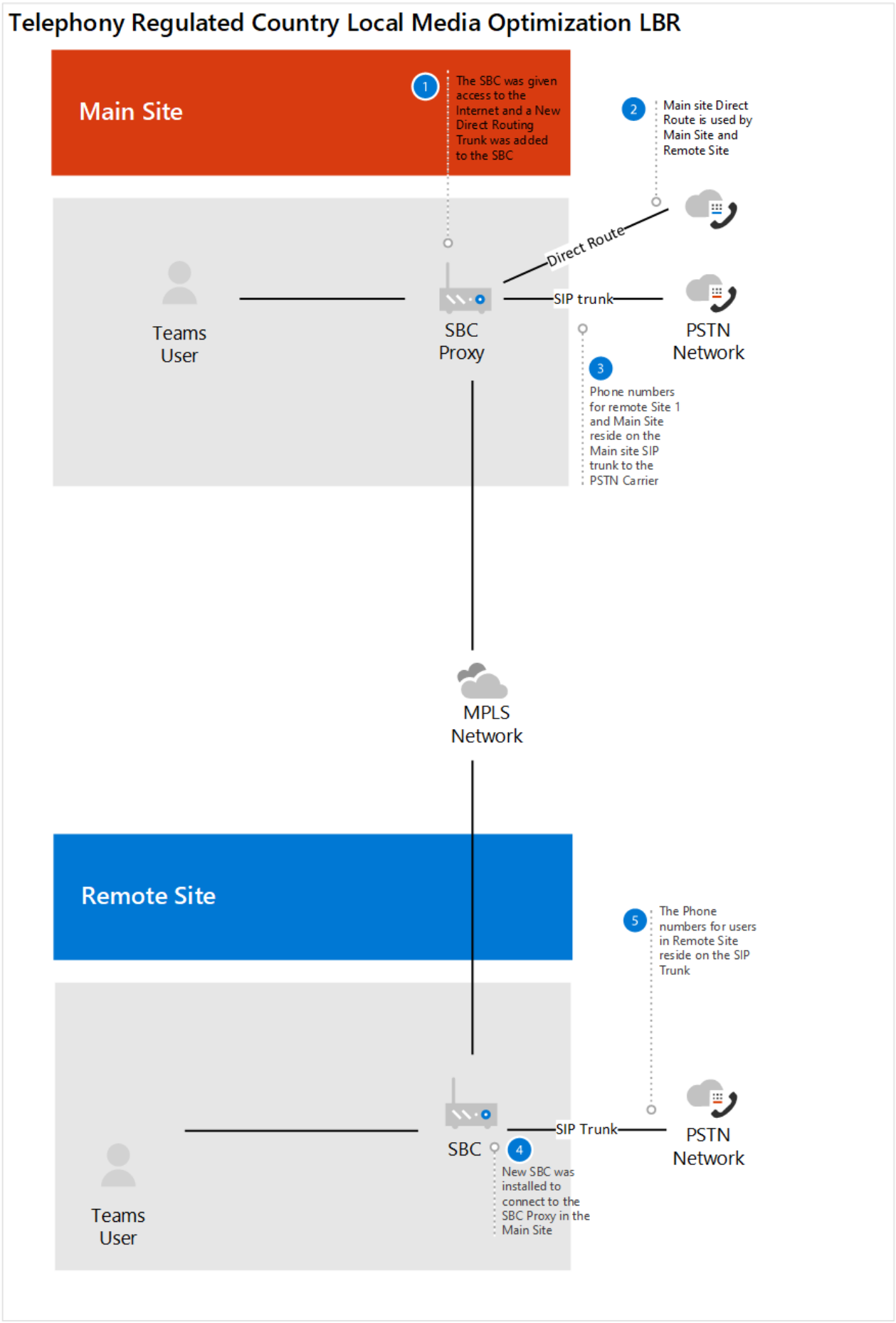
- To delay the enablement of Teams LBR until the existing SBC is certified for Media Bypass.
- Contoso decided to use the main site SBC for the Direct Route to Office 365. The main site SBC will be the proxy SBC for the remote site.
- Contoso used a third-party consultant based in India to assist with certification of the LBR configuration with the telephony company in country.
- To support users working from outside of the office to place PSTN calls, the company issued mobile phone was provided to their employees.

The following diagrams show the before and after deployments for a country with telephony regulations that require Location-Based Routing:

Original deployment



Deployment with Direct Routing



Configuration:

To configure the network components in Teams, Contoso followed the instructions in Manage your network topology for cloud voice features. Contoso completed the below steps to configure Location-Based Routing:

- Define Network regions - One network region was defined.
- Define Network sites - Two network sites were defined. One site for each office location in the region.
- Define Network subnets - Each floor within an office location has their own subnet for the wired and wireless network. This configuration resulted in 20 subnets for Contoso.
- Define trusted IP addresses - The external facing IP addresses for the SBC were added to the trusted IP address.

Contoso case study: Emergency calling

6/17/2020 • 3 minutes to read • Edit Online

To understand the availability of emergency calling and terminology related to emergency calling—Emergency Address, Place, Emergency Location, and Registered address—Contoso reviewed Manage emergency calling and Plan and configure dynamic emergency calling.

In Office 365, a Calling Plan user is automatically enabled for emergency calling. But only Calling Plan users in the United States can use dynamic locations for routing emergency calls.

For Direct Routing, Contoso learned that additional configuration is required for routing emergency calls and possibly for partner connectivity. The administrator must configure connection to an Emergency Routing Service Provider (ERSP) (United States) OR configure the Session Border Controller (SBC) for an Emergency Location Identification Number (ELIN) application.

Contoso has offices in the United States and outside of the United States:

- In the United States, Contoso Calling Plan users can use dynamic locations for routing emergency calls.
- Outside of the United States, Contoso has some sites that use Calling Plans and some sites that are connected to Phone System through Direct Routing.

Emergency calling use cases

After deciding how Contoso will connect to Phone system, Contoso identified the following Emergency calling use cases:

- Calling Plan user in the United States
- Calling Plan user outside of the United States
- User who connects to Phone System through Direct Routing

Calling Plan user in the United States

There are requirements for when the phone number needs to be associated with an emergency location. To understand these requirements, Contoso reviewed Considerations for Calling Plans.

Based on these requirements, Contoso decided to associate the location with the telephone number when a number is assigned to a user in the United States.

Calling Plan user outside of the United States

To understand when a phone number needs to be associated with an emergency location, Contoso reviewed Considerations for Calling Plans. Based on the requirements, Contoso decided the following:

- Contoso will associate the location with the telephone number when a number is assigned to a user in Canada.
- Contoso will assign an emergency location when the phone number is acquired from Office 365 or when a number is transferred from another service provider or carrier.

User who connects to Phone System through Direct Routing

To plan for emergency routing for this use case, Contoso reviewed Considerations for Direct Routing. Because Direct Routing users do not receive emergency calling in the same manner as Calling Plan users, Contoso had to decide on how to provide emergency calling. Direct Routing can be connected to an Emergency Routing Service

Provider (ERSP). Direct Routing can also have an SBC that includes an Emergency Location Identification Number (ELIN).

Emergency Routing Service Provider (ERSP) considerations

The Emergency Routing Service Providers (ERSPs) can automatically route emergency calls based upon the location of the caller.

- If an Emergency Routing Service Provider is integrated into a Direct Routing deployment, emergency calls with a dynamically acquired location will be automatically routed to the Public Safety Answering Point (PSAP) serving that location.
- Emergency calls without a dynamically acquired location are first screened to determine the current location of the user before connecting the call to the appropriate dispatch center based upon the updated location.

ELIN considerations

If an SBC ELIN application is integrated into a Direct Routing deployment, additional configuration steps need to occur to associate the emergency addresses with telephone numbers.

Contoso decided to use Session Border Controllers that include Emergency Location Identification Number (ELIN) applications.

Security desk notification

The ability to notify the security desk when an emergency call is placed is available for both Microsoft Calling Plans and Phone System Direct Routing. Contoso reviewed the details in the Security desk notification to determine if this should be configured at their offices

Contoso decided to use security desk notification.

Configuration

Contoso followed the steps in Configure dynamic emergency calling to:

- Assign emergency addresses
- Configure network settings
- Configure Location Information Service
- Configure emergency policies
- Enable users and sites
- Test emergency calling

After dynamic emergency calling is configured, Contoso needed to assign the location to the appropriate user.

- To add, change, or remove an emergency location for your organization, Contoso followed the steps in Add, change, or remove an emergency location for your organization
- To create places for buildings, floors, and offices, Contoso followed the steps in Add, change, or remove a place for an emergency location .
- To assign an emergency location, Contoso followed the steps in Assign or change an emergency location for a user.

Contoso case study: Audio Conferencing

6/17/2020 • 2 minutes to read • Edit Online

To gain an understanding of audio conferencing—what it is, what it costs, availability, and how it works—Contoso reviewed Audio Conferencing in Office 365.

Overview

For audio conferencing, Contoso used phone numbers that are well known within the organization as well as externally. Because Contoso wanted to maintain these numbers where possible, they reviewed the information on assigning dedicated and shared phone numbers to the audio conferencing bridge.

Based on their research, Contoso made the following decisions:

- Only a segment of the population that regularly host audio conferencing calls would receive Audio Conferencing licenses.
- Contoso would use dedicated phone numbers and port their existing numbers for use with Audio Conferencing.

Because Contoso users were using Skype for Business and all users' mailboxes reside online, many users have existing meetings scheduled. Contoso read Using the Meeting Migration Service (MMS) to learn that existing meetings are updated automatically for Contoso when they change the end user to TeamsOnly mode.

Configuration

Phone numbers that are associated with audio conferencing are referred to as service numbers within Phone System.

- For locations using Calling Plans, to port their existing phone numbers from their phone carrier to Office 365, Contoso followed the steps in Getting service phone numbers.
- To assign the Audio Conferencing license to the end user in the technical pilot, the Contoso administrator followed the steps in Manage the Audio Conferencing settings for your organization.
- For the business pilot and migration, Contoso used group-based licensing by following the steps in Assign licenses to users by group membership in Azure Active Directory.

Contoso case study: Auto attendants and call queues

6/17/2020 • 3 minutes to read • Edit Online

Contoso was familiar with auto attendants and call queues from their on-premises Skype for Business deployment. To understand how to set up Cloud auto attendants, they reviewed What are Cloud auto attendants? and Small business example - Set up auto attendant tutorial. To learn about the options available to set up call queues, Contoso reviewed Create a Cloud call queue.

Requirements depending on site type

Depending on the site type, Contoso had the following needs:

- Site Type A: Traditional legacy telephony systems

  Site Type A needed to keep the same phone number associated with the receptionist as the number for their auto attendants. The key departments for each of these sites would have their own call queues that would route to team members. There was a mixture of sites that used Phone System with Direct Routing and Phone System with Calling Plans.

- Site Type B: Skype for Business Enterprise Voice

  Site Type B had existing auto attendants and call queues that needed to migrate to Teams. Contoso needed to keep the phone numbers associated with the auto attendants. Contoso moved the majority of these sites to Phone System with Calling Plans. However, in the few locations where Calling Plans was not available, Contoso moved these sites to a Direct Routing configuration.

- Site Type C: Skype for Business Enterprise Voice & traditional legacy telephony system

  Site Type C had existing auto attendants that resided in the traditional legacy telephony system. The decisions and configurations for this site were the same as Site Type A.

- For all site types, Contoso asked the following questions:

  - Q: Will we use new or existing numbers? A: Contoso decided to use existing phone numbers to be assigned to the service account for the auto attendant.
  - Q: When will the auto attendant be available to accept incoming calls? A: Contoso decided to set business hours and have calls received after business hours redirected to an "after-hours" auto attendant.
  - Q: How will the calls be routed to members in a call queue: attendant, serial, or round robin routing? A: Contoso decided to use Attendant routing,
  - Q: How will we determine when a user should or should not get a call? A: Contoso decided to use call handling options to determine if the agent is available: presence-based routing.

Configuration

The steps to set up an auto attendant and a call queue include the following outlined in Manage resource accounts:

1. Obtain a service number.
2. Obtain a free Phone System -Virtual User licenseor a paid Phone System license to use with the resource account or a Phone System license.

3. Create the resource account. An auto attendant or call queue is required to have an associated resource account.
4. Assign the Phone System or a Phone System - Virtual user license to the resource account. For more information, see Microsoft 365 Phone System – Virtual User license.
5. Assign a service phone number to the resource account you assigned licenses to.
6. Create a Phone System call queue or auto attendant
7. Link the resource account with a call queue or auto attendant.

Sites with Phone System with Direct routing

Contoso had to set up the phone number provided by the local carrier as the service number in Office 365.

- To set up a phone number available through Direct Routing, Contoso followed the instructions located in Manage Resource Accounts. Because Office 365 is not aware of the on-premises phone numbers, Contoso used PowerShell to complete the setup.
- To configure the Cloud auto attendant, Contoso followed the steps outlined in Set up a Cloud auto attendant.
- To set up a Cloud call queue, Contoso followed the steps outlined in Create a Cloud call queue.

Sites with Phone System with Calling plan

Contoso had to port the phone number that was used for Skype for Business Enterprise Voice auto attendants to Office 365 Phone System. This allowed the same number to be assigned as a service number for use as an auto attendant.

- To port the phone number, Contoso followed the instructions in Transfer phone numbers to Teams and obtained additional guidance at Manage phone numbers for your organization.
- To configure a Cloud auto attendant, Contoso followed the steps outlined in Set up a Cloud auto attendant.
- To set up a Cloud call queue, Contoso followed the steps outlined in Create a Cloud call queue.

Phone number management for Australia

9/30/2020 • 2 minutes to read • Edit Online

In Australia, we have partnered with Telstra for the purchase and provisioning of Calling Plans for customers with a billing address in Australia. Telstra will sell their Calling Plans, provide Australian user numbers and also provide the support for phone number management for both user and service numbers for auto attendants and call queues. However, service numbers and licenses for Audio Conferencing will still be sold and managed by Microsoft 365 and Office 365.

For more information on the Telstra Calling.

Use this table to find information on getting and managing phone numbers in Australia for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DO THESE STEPS AND DOWNLOAD THE CORRECT FORMS
Get new user phone numbers for Calling Plans in Australia.	Please contact Telstra Calling for new phone numbers for your users. They will then add those numbers to your organization so you can assign them to your users.
If you are utilizing Telstra Calling, you may get new service phone numbers that can be used with Cloud auto attendants and call queues for Australia from Telstra.	Please contact Telstra Calling for new phone numbers. They will then add those numbers to your organization so you can assign them to your auto attendants and call queues. If you are NOT utilizing Telstra Calling, you may contact our Microsoft Number ManagementService desk to obtain service numbers from Microsoft Please contact us.
Get new service phone numbers for Audio Conferencing in Australia.	Please contact us.
Get phone numbers transferred to Microsoft 365 or Office 365 for users, auto attendants and call queues.	Please contact Telstra Calling to transfer phone numbers. They will then add those numbers to your organization.
Get phone numbers transferred to Microsoft 365 or Office 365 for use with Audio Conferencing.	Please contact us
Change emergency addressing assigned to users that have a Call Plan phone number.	Please contact Telstra Calling to make emergency address changes. They can update this information for you.
Change a user number to a service number.	Supported when using Telstra Calling.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Phone number management for Austria

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Austria for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user and service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Austria (v.5.0) (de-de) New phone number request for Austria (v.5.0) (en-us) Fill it out and send it to us. You must also include a utility bill from the business address for which you want to get new numbers.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Austria (all numbers) (v.5.0) (de-at) Fill it out and send it to us. You must also include a utility bill from the business address for which you want to transfer numbers.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Belgium

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Belgium for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user and service phone numbers that aren't listed in the Microsoft Teams admin center.	In Belgium, you can't get phone numbers for your organization using the Microsoft Teams admin center, you must submit a new phone number request. Download one of these forms: New phone number request for Belgium (v.5.0) (de-be) New phone number request for Belgium (v.5.0) (fr-be) New phone number request for Belgium (v.5.0) (nl-be) New phone number request for Belgium (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms. Letter of Authorization (LOA) for Belgium (all numbers) (v.5.0) (de-be) Letter of Authorization (LOA) for Belgium (all numbers) (v.5.0) (de-be) Letter of Authorization (LOA) for Belgium (all numbers) (v.5.0) (nl-be) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Canada

12/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Canada for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DO THESE STEPS AND DOWNLOAD THE CORRECT FORMS
Get new user and service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms: New phone number request for Canada (v.5.0) (en-ca) New phone number request for Canada (v.5.0) (fr-ca) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms: Letter of Authorization (LOA) for Canada (user and service numbers) (v.3.2) (en-ca) Letter of Authorization (LOA) for Canada (user and service numbers) (v.1.0) (fr-ca) Letter of Authorization (LOA) for Canada (toll free numbers) (v.3.2) (en-ca) Letter of Authorization (LOA) for Canada (toll free numbers) (v.1.1) (fr-ca) **Note:** If you're trying to get more than 999 subscriber or user phone numbers, you'll need to fill out a Letter of Authorization (LOA) and send it to us. See Transfer phone numbers to Teams for more information. Fill it out and send it to us.
Change a user's number to a service number.	Send us your PIN and the list of user numbers you want to convert to service numbers. To set up a PIN, go here.
Transfer numbers from one Microsoft 365 or Office 365 to another.	Send us the list of user (subscriber) phone numbers you want to transfer along with the PIN of the source organization where you want to transfer the numbers from. To set up a PIN, go here.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Denmark

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Denmark for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user and service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Denmark (v.5.0) (da-dk) New phone number request for Denmark (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Denmark (all numbers) (v.5.0) (da-dk) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for France

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in France for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for France (v.5.0) (fr-fr) New phone number request for France (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms. For user phone numbers: Letter of Authorization (LOA) for France (geographic numbers) (v.5.0) (fr-fr) For toll-free phone numbers: Letter of Authorization (LOA) for France (freephone numbers) (v.5.0) (fr-fr) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Germany

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Germany for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	In Germany, you can't get phone numbers for your organization using the Microsoft Teams admin center. You must submit a new phone number request. Download one of these forms. New phone number request for Germany (v.5.0) (de-de) New phone number request for Germany (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms. For user phone numbers: Letter of Authorization (LOA) for Germany (geographic numbers) (v.5.0) (de-de) For toll-free phone numbers: Letter of Authorization (LOA) for Germany (toll-free numbers) (v.5.0) (de-de) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Ireland

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Ireland for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	In Ireland, you can't get phone numbers for your organization using the Microsoft Teams admin center. You must submit a new phone number request. Download this form. New phone number request for Ireland (v.5.0) (en-us). Fill it out, and send it to us.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Ireland (all numbers) (v.5.0) (en-us) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Italy

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Italy for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Italy (v.5.0) (it-it) New phone number request for Italy (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Italy (all numbers) (v.5.0) (it-it) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, download this Directory Services form for Italy (v.1.0) (it-it), fill it out and send it to us.
Review the Charter of Services	Download and read the Charter of Services for Italy (v.1.0) (it-it).

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Japan

9/30/2020 • 2 minutes to read • Edit Online

In Japan, we have partnered with SoftBank for the purchase and provisioning of Calling Plans for customers with a billing address in Japan. SoftBank will sell their Calling Plans, provide user numbers for Japan, and provide the support for phone number management. However, service numbers and licenses for audio conferencing, auto attendants, and call queues will still be sold and managed by Microsoft 365 and Office 365.

For more information on the SoftBank Calling.

Use this table to find information on getting and managing phone numbers in Japan for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DO THESE STEPS AND DOWNLOAD THE CORRECT FORMS
Get new user phone numbers for Calling Plans in Japan.	Please contact SoftBank Calling for new phone numbers for your users. They will then add those numbers to your organization so you can assign them to your users.
Get new service phone numbers for audio conferencing, auto attendants and call queues in Japan.	Please contact us.
Get phone numbers transferred over to Microsoft 365 or Office 365 for **users** in Japan.	Please contact SoftBank Calling to transfer user phone numbers. They will then add those numbers to your organization.
Get phone numbers transferred over to Microsoft 365 or Office 365 for **call queues** in Japan.	Please contact SoftBank Calling to transfer service phone numbers. They will then add those numbers to your organization.
Change the emergency address assigned to users that have a Calling Plan phone number.	Please contact SoftBank Calling to make emergency address changes. They can update this information for you.
Change a user number to a service number.	Not currently supported when using SoftBank Calling.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Phone number management for Portugal

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Portugal for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Portugal (v.5.0) (pt-pt) New phone number request for Portugal (v.5.0) (en-us) Fill it out and send it to us. You must also fill out a tri-party agreement, sign it, and send it to us. This form will be sent to you by our PSTN service desk team after you place an order to get new phone numbers.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Portugal (all numbers) (v.5.0) (pt-pt) Fill it out and send it to us. You must also fill out a tri-party agreement, sign it, and send it to us. This form will be sent to you by our PSTN service desk team after you place an order to transfer phone numbers.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Spain

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Spain for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Spain (v.5.0) (es-es) New phone number request for Spain (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Spain (all numbers) (v.5.0)(es-es) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for the Netherlands

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in the Netherlands for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for the Netherlands (v.5.0) (nl-nl) New phone number request for the Netherlands (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms: Letter of Authorization (LOA) for the Netherlands (all numbers) (v.5.0) (nl-nl) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Sweden

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Sweden for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Sweden (v.5.0) (sv-se) New phone number request for Sweden (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download this form. Letter of Authorization (LOA) for Sweden (all numbers) (v.5.0) (sv-se) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for Switzerland

10/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in Switzerland for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS AND SEND THEM TO US
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download one of these forms. New phone number request for Switzerland (v.5.0) (de-de) New phone number request for Switzerland (v.5.0) (fr-fr) New phone number request for Switzerland (v.5.0) (it-it) New phone number request for Switzerland (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms. Letter of Authorization (LOA) for Switzerland (all numbers) (v.5.0) (de-ch) Letter of Authorization (LOA) for Switzerland (all numbers) (v.5.0) (fr-ch) Letter of Authorization (LOA) for Switzerland (all numbers) (v.5.0) (it-ch) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for the United Kingdom

9/30/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in the United Kingdom for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DOWNLOAD THE CORRECT FORMS
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download this form. New phone number request for the United Kingdom (v.5.0) (en-gb) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms: Letter of Authorization (LOA) for the United Kingdom (geographic numbers) (v.5.0) (en-us) Letter of Authorization (LOA) for the United Kingdom (toll-free numbers) (v.5.0) (en-us) Fill it out and send it to us.
Publish/unpublish phone number(s) in the national phone directory.	Send us the list of phone numbers you want to publish/unpublish.
Change a user's number to a service number.	Send us the list of user numbers you want to convert to service numbers.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Phone number management for the United States

12/5/2020 • 2 minutes to read • Edit Online

Use this table to find information on getting and managing phone numbers in the United States (including Puerto Rico) for Microsoft Teams.

For more information, see Manage phone numbers for your organization.

WHAT YOU WANT TO DO?	DO THESE STEPS AND DOWNLOAD THE CORRECT FORMS
Get new user or service phone numbers that aren't listed in the Microsoft Teams admin center.	Download this form. New phone number request for the United States (v.5.0) (en-us) Fill it out and send it to us.
Get phone numbers transferred to us.	Download one of these forms: Letter of Authorization (LOA) for the United States (user and service numbers) (v.3.3)(en-us) Letter of Authorization (LOA) for the United States (toll free numbers) (v.3.3)(en-us) **Note** If you are trying to get more than 999 subscriber or user phone numbers, you will need to fill out a Letter of Authorization (LOA) and send it to us. See Transfer phone numbers to Teams for more information. Fill it out and send it to us.
Change a user's number to a service number or a service number to a user's number	Send us your PIN and the list of numbers you want to convert. To set up a PIN, see here.
Transfer numbers from one Microsoft 365 or Office 365 to another.	Send us the list of user (subscriber) phone numbers you want to transfer along with the PIN of the source organization where you want to transfer the numbers from. To set up a PIN, see here.
Make directory service updates to call queue or auto attendant numbers	To add or change call queue or auto attendant numbers, contact the PSTN service desk.

Related topics

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency calling terms and conditions

Emergency Calling disclaimer label

Toll-free dialing limitations and restrictions

9/30/2020 • 2 minutes to read • Edit Online

This will help you find out how to dial toll free numbers in each country or region. After you select the country/region, it will take you to a page that contains where toll free service is available including specific details, restrictions, and limits. The dialing format or formats will show you the required access codes within each country/region to dial the toll-free number.

If you're ready, select a country or region:

Select your country or region to see the dialing codes, limitations and restrictions.

Here are some important things for you to remember about toll free numbers:

- **Toll free numbers only operate within each country/region.** For example, your users won't be able to call an Australian toll-free number outside of Australia.
- **Acquiring or porting Universal International Freephone Numbers (UIFN) isn't supported.**
- **In many countries/regions, the regulator/telecommunication agency in the country/region requires each toll free phone number to maintain at least 100 minutes of usage per month in order to retain the number.**

  > **NOTE**
  >
  > In the event you get a toll free number and the usage of the number doesn't meet these minimum requirements, Microsoft may be compelled by the regulator/telecommunication agency to reclaim the number from you.

- **Wireline, fixed line, and mobile network access to toll-free numbers may be fully or partially restricted.** The dialing format describes the required access codes within each country/region to place calls using the toll free number.
- **North America Numbering Plan Toll Free Numbers:** Per-minute rates for North America Numbering Plan toll free numbers are determined by the originating country. The toll free per-minute rate for calls that originate from the United States map to the rate defined as "North America." However, calls that originate from other North American countries such as Canada, Puerto Rico, etc. have specific toll free rates.

> **NOTE**
>
> If you need to get more telephone numbers than this, please contact support for business products - Admin Help

Related topics

Toll-free dialing restrictions in Argentina

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800 XXX XXXX
Country/region ISO code	AR
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	No access from Telmex (and subsidiaries)
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Australia

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800 XXX XXXX
Country/region ISO code	AU
Island/territory covered	Christmas Islands, Tasmania, Cocos Islands
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Austria

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XX XXX
Country/region ISO code	AT
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes (some numbers may be premium)
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers

Toll-free dialing restrictions in Belarus

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	8 820 XXXX XXXX
Country/region ISO code	BY
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile network access from Velcom, MTS, and Life.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Belgium

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XX XXX
Country/region ISO code	BE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes, at premium rate.
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Belize

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	1 800 XXX XXXX
Country/region ISO code	BZ
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Mobile: Available from the BTL mobile network.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Bosnia and Herzegovina

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800 XXXXX
Country/region ISO code	BA
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Partial. See comments.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Accessible from HT Eronet/Mostar, Telekom Srpske/MTEL, and BHT fixed and mobile networks.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Brazil

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800-891-XXXX 0800 XXX XXXX
Country/region ISO code	BR
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Partial but at premium rate. See comments.
Comments, restrictions, and access issues	Mobile access: No airtime is charged.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Brunei

2/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	801 4XXX
Country/region ISO code	BN
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Bulgaria

2/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00800 XXX XXXX
Country/region ISO code	BG
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Mobile access from Vivacom & Globul Mobile.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Chile

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	123 XXXX XXXX 188 800 XXX XXX
Country/region ISO code	CL
Island/territory covered	Not applicable
Island/territory not covered	No access from Easter Islands.
Wired/fixed line availability	Partial. See comments.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	The 188 800 XXX XXX number format is accessible from the Telefonica network. The 123 XXXX XXXX number format is accessible from Entel network only. Mobile access is accessible for both number formats.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in China - North (10 800 714 XXXX range)

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	10 800 714 XXXX
Country/region ISO code	CN
Island/territory covered	North China / China Netcom network only
Island/territory not covered	South China
Wired/fixed line availability	From China Netcom only
Mobile network availability	No
Comments, restrictions, and access issues	Not accessible from a payphone.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in China - South (10 800 140 XXXX range)

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	10 800 140 XXXX
Country/region ISO code	CN
Island/territory covered	South China / China Telecom network only
Island/territory not covered	North China
Wired/fixed line availability	From China Telecom only
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Not accessible from a payphone.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Colombia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	01 800 XXX XXXX
Country/region ISO code	CO
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Croatia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800 XXX XXX 0800 XXXX
Country/region ISO code	HR
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: No airtime charged.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Cyprus

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	8009 - XXXX
Country/region ISO code	CY
Island/territory covered	Not applicable
Island/territory not covered	No access from parts of Cyprus occupied by Turkish army.
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: No airtime charged.

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Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Denmark

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	801 802 803 804 8060 8061 8062 8063 807 808 809
Country/region ISO code	DK
Island/territory covered	Not applicable
Island/territory not covered	No access from Faroe Islands or Greenland.
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numberss

Toll-free dialing restrictions in Ecuador

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	1-800-XXX-XXX
Country/region ISO code	EC
Island/territory covered	Not applicable
Island/territory not covered	No access from Cuenca (Etapa).
Wired/fixed line availability	From Pacifictel only.
Mobile network availability	No
Comments, restrictions, and access issues	Access from Pacifictel network only.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Egypt

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DETAILS	DESCRIPTION
Is toll-free calling available?	No
Dialing format(s)	0800-XXX-XXXX
Country/region ISO code	EG
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From Telecom Egypt only.
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Estonia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 XXXX (XXX)
Country/region ISO code	EE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Finland

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXX
Country/region ISO code	FI
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in France

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 9XX XXX
Country/region ISO code	FR
Island/territory covered	France mainland and Corsica
Island/territory not covered	No access from Monaco, Reunion, Martinique, Guadeloupe, Guyane, St. Pierre-&-Miquelon, Mayotte, New Caledonia, French Polynesia, Wallis & Futuna.
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Germany

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXXX
Country/region ISO code	DE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	Access isn't guaranteed from international mobile roamers.

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Honduras

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 XXXX XXXX
Country/region ISO code	HN
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From Hondutel only.
Mobile network availability	From Tigo only.
Comments, restrictions, and access issues	None

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Toll-free dialing restrictions in Hong Kong

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 XXX XXX
Country/region ISO code	HK
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

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Toll-free dialing restrictions in Hungary

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	06 800 XXX XX 06 801 XXX XX
Country/region ISO code	HU
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	None

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in India

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	000 800 XXX XXXX
Country/region ISO code	IND
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Partial. See comments.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Access available from the following networks: Loop Mobile, BSNL - fixed (all regions but Bhopal), Vodafone, IDEA/SPICE (all regions but Punjab Spice), MTS India/Shyam (fixed), MTNL - fixed & mobile, Reliance (all regions but Ahmedabad, Bhopal, Bhuneswer, Jaipur, Lucknow, Meerut), TTML & TTSL (fixed & postpaid), Tata DoCoMo, HFCL Infotel/Ping Mobile, S-Tel Mobile, Uninor, Videocon Mobile, BSNL-mobile, Bharti/Airtel network. Access not available from the following networks : TTSL (Prepaid), Etisalat DB Telecom and Jio.

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Toll-free dialing restrictions in Indonesia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	001 803 CCC XXXX 007 803 CCC XXXX
Country/region ISO code	ID
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Two number formats are provided for greater coverage. The number format 007 803 CCC XXXX format is accessible from the PT Telkom network, including Telkomsel and XL mobile. The number format 001 803 CCC XXXX is accessible from the Indosat network. For mobile: Matrix Cellular (prefix 0855, 0858, 0815, and 0816) only.

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Toll-free dialing restrictions in Ireland

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	1 800 XXX XXX
Country/region ISO code	IE
Island/territory covered	All offshore islands of the Republic of Ireland are covered.
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Accessible through Vodafone,O2 Digiphone, Meteor, and H3G mobile networks.

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Toll-free dialing restrictions in Israel

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	1-80-94X-XXXX 1-80-92X-XXXX
Country/region ISO code	IL
Island/territory covered	Not applicable
Island/territory not covered	No access from Palestinian Territories.
Wired/fixed line availability	Yes
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Mobile access: No access from Paltel & Jawal/Watania mobile networks.

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Italy

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 803
Country/region ISO code	IT
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes (some numbers may be premium)
Comments, restrictions, and access issues	None

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Getting service phone numbers

Toll-free dialing restrictions in Japan

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00531 XX XXXX
Country/region ISO code	JP
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Mobile networks access: NTT Docomo, Au (KDD), and Softbank.

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Toll-free dialing restrictions in Kenya

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 7XX XXX
Country/region ISO code	KE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Partial. See comments.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Fixed network access: Safaricom and Airtel. Mobile network access: Safaricom, Airtel, and Orange.

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Luxembourg

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 2 XXXX
Country/region ISO code	LU
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Malaysia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	1 800 XXX XXX
Country/region ISO code	MY
Island/territory covered	Peninsular Malaysia and East Malaysia
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Mexico

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	001 800 XXX XXXX 01 800 XXX XXXX
Country/region ISO code	MX
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Partial. See comments.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Access isn't guaranteed from international roamers. For the 001-800 number format: For Fixed access - Telmex. For Mobile access - Telcel only. Airtime is charged. No additional charge if end customer is with Telmex as their local and long distance provider. For the 01-800 number format: Mobile access airtime is charged.

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Moldova

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 6XXXX
Country/region ISO code	MD
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Monaco

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 9X XXX
Country/region ISO code	MC
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in the Netherlands

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXXX
Country/region ISO code	NL
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	Mobile access: Airtime will be charged

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Panama

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00-800-XXX-XXXX
Country/region ISO code	PA
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From C&W only.
Mobile network availability	No
Comments, restrictions, and access issues	The customer must dial 011 (the international long-distance Panama code) before the toll-free number.

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Paraguay

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	009-800-101-XXX
Country/region ISO code	PY
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

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Toll-free dialing restrictions in Peru

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XX XXX
Country/region ISO code	PE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

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Toll-free dialing restrictions in Philippines

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	1 800 XXXX XXXX
Country/region ISO code	PH
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From PLDT only.
Mobile network availability	Partial but at premium rate. See comments.
Comments, restrictions, and access issues	Available from Sun Cellular and Smart Mobile networks.

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Poland

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00 800 XXX XX XX
Country/region ISO code	PL
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

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Toll-free dialing restrictions in Portugal

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	8000 8001 8002 8003 8004 8005 8006 8007 8008 8009 802
Country/region ISO code	PT
Island/territory covered	Azores, Madeira
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers

Toll-free dialing restrictions in Qatar

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00800 XXXXXX
Country/region ISO code	QA
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From Qtel only.
Mobile network availability	From Qtel & Vodafone only.
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Romania

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXX
Country/region ISO code	RO
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From Romtelecom only.
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	None

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Saudi Arabia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 814 XXXX 800 850 XXXX
Country/region ISO code	SA
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	From STC only.
Mobile network availability	From STC only.
Comments, restrictions, and access issues	None

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Serbia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800 XXX XXX
Country/region ISO code	RS
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	No

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Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Singapore

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 XXX XXXX
Country/region ISO code	SG
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Slovakia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 0XX XXX
Country/region ISO code	SK
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	None

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in Slovenia

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 800XX
Country/region ISO code	SI
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

See also

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Toll-free dialing limitations and restrictions

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Toll-free dialing restrictions in South Africa

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXX
Country/region ISO code	ZA
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	Mobile access: Airtime is charged.

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Toll-free dialing restrictions in South Korea

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DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	003 XXXX XXXX 00798 14 XXX XXXX
Country/region ISO code	KR
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Spain

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	900 XXX XXX
Country/region ISO code	ES
Island/territory covered	Balearic Island and Canary Island
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. Available at premium rate.
Comments, restrictions, and access issues	Mobile identification using different outpulses available.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Sweden

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	020
Country/region ISO code	SE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Switzerland

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0800
Country/region ISO code	CH
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes (some numbers may be premium)
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers

Toll-free dialing restrictions in Taiwan

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00 801 XXX XXX
Country/region ISO code	TW
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	ITFS:KG Telecom = NO
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	No wireline access from KG Telecom. Mobile access: No airtime is charged. For Mobile access: Access from all mobile networks except KG Telecom.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Thailand

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	001 800 XXX XXX XXXX 1-800-XXX-XXX
Country/region ISO code	TH
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes. See comments.
Comments, restrictions, and access issues	Mobile access: Airtime isn't charged except for roamers where they will be charged as local airtime. For mobile access: Accessible from all mobile networks.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Turkey

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	00 800 XXXX XXXXX
Country/region ISO code	TR
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes, except from Super Online.
Mobile network availability	No
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in the United Arab Emirates

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	800 014 XXXX 800 017 XXXX 800 XX XXX 800 X XXXX XXXX
Country/region ISO code	AE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in the United Kingdom (U.K.)

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXXX 0 808 XXX XXXX
Country/region ISO code	GB
Island/territory covered	England, Guernsey, Isle of Man, Northern Ireland, Scotland, Wales, and Channel Islands
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Uruguay

2/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0004 019 XXXX
Country/region ISO code	UY
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes, except from Claro.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	Mobile access: Airtime is charged. Mobile access: Available from Ancel and Movistar.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Venezuela

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	0 800 XXX XXXX
Country/region ISO code	VE
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Yes
Mobile network availability	Yes
Comments, restrictions, and access issues	None

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

Toll-free dialing restrictions in Vietnam

4/3/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about toll-free dialing limitations and restrictions.

DETAILS	DESCRIPTION
Is toll-free calling available?	Yes
Dialing format(s)	120-11-3XX 122-XXX-XX 1800 XXXX: format no longer provided
Country/region ISO code	VN
Island/territory covered	Not applicable
Island/territory not covered	Not applicable
Wired/fixed line availability	Partial. See comments.
Mobile network availability	Partial. See comments.
Comments, restrictions, and access issues	The 120 XX XXX number format will work from Vietnam Telecom International (VTI) and VNPT (Vietnam Post and Telecommunications) fixed and mobile networks. As of June 2018, the 120 XX XXX number format cannot be called from Mobifone's mobile network. **Note:** Mobifone & Vinaphone are part of VNPT. The number format 122 XXX XX network coverage: Viettel (fixed and mobile). As per the Vietnam Ministry of Telecommunications, the maximum allowable call duration is 2 hours.

Related topics

Toll-free dialing limitations and restrictions

Getting service phone numbers for Skype for Business and Microsoft Teams

What are Communications Credits?

12/5/2020 • 5 minutes to read • Edit Online

Communications Credits are a convenient way to pay for Audio Conferencing and Calling Plan minutes. It helps ensure you and your users are never caught without being able to:

- Add toll-free numbers to use with Audio Conferencing meetings, auto attendants, or call queues. Toll-free calls are billed per minute and require a positive Communications Credits balance.
- Dialing out from an Audio Conference meeting to add someone else from anywhere in the world.
- Dialing out from an Audio Conference meeting to your mobile phone with the Microsoft Teams app or Skype for Business app installed to destinations that aren't already included in your subscription.
- Dial any international phone number when you have **Domestic Calling Plan** subscriptions.
- Dial international phone numbers beyond what is included in a **Domestic and International Calling Plan** subscription.
- Dial out and pay per minute once you have exhausted your monthly minute allotment.

> **NOTE**
> Outbound calls to some destinations may be included in your Audio Conferencing subscription. Please check your subscription information for details.

> **NOTE**
> If your organization is located in a different region than the billing address of your Enterprise Agreement (EA), you might not be able to purchase Communications Credits. If you are unable to acquire Communications Credits, open a support incident from the portal and we will work with you to mitigate this issue until a permanent solution is in place.

What are the Communications Credits rates?

If you're wondering how what the cost of the calls are for Calling Plans, see Communications Credits Rates for Calling Plans (scroll down to "See rates for where you want to call").

What is it?

To use toll-free numbers, Communications Credits are required as these calls are billed per minute. Also, we recommend that you set up Communications Credits for your Calling Plan and Audio Conferencing users who need the ability to dial out to **any PSTN destination**. Many countries/regions are included, but some destinations may not be included in your Calling Plan or Audio Conferencing subscriptions. If you don't set up Communications Credits or assign a license to your users and you run out minutes for your organization (depending on your Calling Plan, Audio Conferencing plan, or your country/region), those users won't be able to make calls or dial out from Online Audio Conferencing meetings.

NOTE

You must set up Communications Credits and then assign a Communications Credits license for each user in the **Microsoft 365 admin center** > **Users** > **Active Users**. Communications Credits licenses will appear as unlimited in quantity as they are used to grant access to the Communications Credits balance for any user to which you assign the Communications Credits license.

It's recommended that you carefully evaluate your organization's PSTN Service usage in order to understand the best setup for Communications Credits. You can see more about PSTN services by reading Phone System and Calling Plans and Audio Conferencing common questions.

You can set up consumption billing using a **one-time funding** of the pre-paid balance **OR** by setting up an **auto-recharge** (**recommended**) amount with a minimum balance that will trigger a purchase for that recharge amount. Initially, it's suggested that you set up auto recharge amounts that allow you to monitor actual usage and find the right auto recharge thresholds that meet your needs and usage patterns. Communications Credits should be monitored over time and then adjust the minimum balance and recharge amounts as needed to be tailored for each organization's needs.

NOTE

You can see the plans and pricing by signing in to the Microsoft 365 admin center and going to **Billing** > **Subscriptions** > **Add subscriptions**.

In the **Microsoft 365 admin center** > **Billing** > **Purchase Services** > **Add Ons** you can select Communication Credits to add the credits, and you can add credit manually at any time. You can also enable the **Auto-recharge** option, which will allow automatic account refills when the balance falls below the threshold that you set. If you choose to fund your Communications Credits balance with a one-time amount and then the balance falls to zero, the additional calling scenarios above will no longer work, including toll-free phone numbers. As such, it's recommended that you use the **Auto-recharge** setting to avoid any disruption of service should your Communications Credits balance reach 0 (zero). You may view your current Communication Credits balance by going to **Billing** > **Your products** > **Communications Credits**.

NOTE

You will be sent emails to **all users** with Lync Service Administrator, Company Administrator, Billing Administrator, Company Administrator, User Account Administrator, Helpdesk Administrator, Service Support Administrator, Billing Administrator, Lync Service Administrator, Device Administrators, Application Administrator, License Administrator, Cloud Device Administrator, Authentication Administrator, Privileged Authentication Administrator, Teams Communications Administrator, Teams Communications Support Engineer, Teams Communications Support Specialist, Teams Service Administrator admin roles, when recharge transactions succeed, recharge transactions fail (such as an expired credit card), and or your Communications Credits balance reaches 0 (zero).

Communications Credits

Each organization will have a different usage of Calling Plans volume and rates to consider. You will need to get this type of usage data from your current service provider. For organizations using Teams already as their service provider, you can get usage data by reviewing it in the Microsoft Teams admin center > **Analytics & reports** > **Usage reports**, and then select **PSTN usage**.

When you are setting up Communications Credits, you will need to investigate call usage for your organization to determine the amounts that you will need to put in. You can get call usage information by reviewing the PSTN usage report. This report lets you export the call data records to Excel and create custom reports.

Important notifications related to the Communication Credits balance of your organization will be sent to the following admins:

- Billing Administrator
- Skype for Business Administrator
- Company Administrator
- User Account Administrator
- Helpdesk Administrator
- Service Support Administrator
- Device Administrators
- Application Administrator
- License Administrator
- Cloud Device Administrator
- Authentication Administrator
- Privileged Authentication Administrator
- Teams Communications Administrator
- Teams Communications Support Engineer
- Teams Communications Support Specialist
- Teams Service Administrator

> **NOTE**
> Communications Credits are also used for premium rate numbers. The caller pays the charges.

Recommended funding amounts

We recommended that you begin by using a small funding amount, which for smaller organizations could be even the minimum of $50. After you gather a month or two of PSTN usage using the PSTN usage details report, you'll be able to adjust the amounts to meet the normal usage in your organization.

If you're ready to set this all up, see Set up Communications Credits for your organization.

Want to know about plans and pricing?

You can see the plans and pricing by visiting one of the following links:

- Calling Plans
- Audio Conferencing
- Phone System

You can also see information about pricing by signing in to the Microsoft 365 admin center and going to **Billing** > **Purchase Services**.

To see a table with the license or licenses you will need for each feature, see Microsoft Teams add-on licensing.

Related topics

Teams PSTN usage report

Set up Communications Credits for your organization

12/5/2020 • 5 minutes to read • Edit Online

You will need to set up Communications Credits if you would like to use toll-free numbers with Skype for Business and Microsoft Teams. Also, we recommend that you set up Communications Credits for your Calling Plans (Domestic or International) and Audio Conferencing users who need the ability to dial out to **any destination**. Many countries/regions are included, but some destinations may not be included in your Calling Plan or Audio Conferencing subscriptions. If you don't set up Communications Credits billing and assign a **Communications Credits** license to your users and you run out minutes for your organization (depending on your Calling Plan or Audio Conferencing plan in your country/region), those users won't be able to make calls or dial out from Audio Conferencing meetings. You can get more information, including recommended funding amounts, by reading What are Communications Credits?

> **NOTE**
> To find out how much it costs, see the rates here.

Step 1: Assign an Audio Conferencing or Calling Plan license to your users

When you sign up, you get a certain number of minutes depending on your country/region. You can search for your country or region in the Country or region availability list for Audio Conferencing and Calling Plans to see the number of minutes you will get. After you use those minutes, calls will be disconnected. To prevent this from happening, you need to set up Communications Credits.

To do so, **you need to assign an Audio Conferencing or Phone System license** to your users.

- Assign an **Audio Conferencing** license to your users. See Assign Microsoft Teams add-on licenses.

  After you assign this license, you will need to set up audio conferencing. For step-by-step instructions, see Try or purchase Audio Conferencing in Microsoft 365 or Office 365.

- Assign **Phone System** and a **Domestic or Domestic and International** Calling Plan license to your users. See Assign Microsoft Teams add-on licenses.

  > **NOTE**
  > Although it's not required for Communications Credits, you still need to also assign a **Domestic Calling Plan** or a **Domestic and International Calling Plan** license.

  After you assign these licenses, you will need to get your phone numbers for your organization, and then assign those numbers to the people in your organization. For step-by-step instructions, see Set up Calling Plans.

For more information, see Microsoft Teams add-on licensing

Step 2: Set up Communications Credits for your organization

1. Sign in to the Microsoft 365 admin center with your work or school account.
2. In the left navigation of the Microsoft 365 admin center, go to **Billing** > **Purchase Services**. Scroll down and select **Add-Ons**.
3. Select **Communications Credits**.
4. On the **Communications Credits** subscription page, fill in your information, and then click **Next**:

   - **Add funds** Enter the amount that you want to add to your account. If you don't enable auto-recharge, once these funds are depleted, calling capabilities that are enabled using Communications Credits will be disrupted (such as inbound toll-free service). To avoid having to manually replenish your Communications Credits balance each time your balance reaches 0 (zero), we recommend you enable the auto-recharge feature.
   - **Auto-recharge** Enabling auto-recharge will automatically refill your account when the balance falls below the threshold that you set.

     It's recommended that you use the **Auto-recharge** setting to avoid any disruption of service should your Communications Credits balance reach 0 (zero). You will be sent an email when recharge transactions succeed, when recharge transactions fail (such as an expired credit card), and when your Communications Credits balance reaches 0 (zero).
   - **Recharge amount** Enter the amount in the **Recharge with** box that you want added to your account once it reaches the trigger amount below.
   - **Trigger amount** Enter the amount in **When the balance falls below** box that will be used to ' *trigger* ' the auto-recharge. Once your balance falls below this amount, the recharge amount will be added automatically to your account.

     > **NOTE**
     >
     > Funds will be applied only to Communications Credits at Microsoft published rates when the services are used. Any funds not used within 12 months of the purchase date will expire and be forfeited.
     >
     > Monthly billing for Communication Credits will only be applied if the alloted fund has been used, to learn how to check your monthly usage, read Skype for Business PSTN usage report

5. Enter your payment information and click **Place order**.

   > **IMPORTANT**
   >
   > If you are a volume licensing customer, you may choose your enterprise agreement number for payment. If you have multiple enterprise agreement numbers, you will be able to select which enterprise agreement you would like to use for payment. You will also be given an opportunity to specify a purchase order number to associate with the enterprise agreement number (if applicable).

Each organization will have a different usage of Calling Plan volume and rates to consider. You will need to get this type of usage data from your current service provider. Organizations already using Skype for Business Online already as their service provider can get usage data by reviewing it in the **Microsoft Teams admin center** > **Reports** > **PSTN usage details** report.

When you are setting up Communications Credits, you will need to investigate call usage for your organization to determine the amounts you need. You can get call usage information by reviewing the **PSTN usage details** report. This report lets you export the call data records to Excel if you need to store the data or create custom reports. To learn how to see usage, read PSTN usage report.

Step 3: Assign a Communications Credits license to users

1. Sign in to the Microsoft 365 admin center with your work or school account.
2. In the left navigation of the Microsoft 365 admin center, go to **Users** > **Active users**, and then select a user from the list.
3. Choose **Licenses and Apps**.
4. Toggle **Communications Credits** to **On** to assign this license, and then select **Save**.

> **NOTE**
> Even if you have users who are assigned an **Enterprise E5** license, it's still recommended that you do this.

> **TIP**
> You can use Powershell to assign licenses and apps to multiple users with one command.

Want to know about plans and pricing?

You can see the plans and pricing by visiting one of the following links:

- Calling Plans
- Audio Conferencing Plans
- Phone System Plans

You can also see information by signing in to the Microsoft 365 admin center and going to **Billing** > **Subscriptions** > **Add subscriptions**.

To see a table with the license or licenses you will need for each feature, see Microsoft Teams add-on licensing.

Related topics

- Set up Skype for Business Online
- Set up Cloud Voicemail - Admin help
- Set up Calling Plans and Calling Plans for Microsoft 365 or Office 365
- Add funds and manage Communications Credits

Add funds and manage Communications Credits

12/5/2020 • 2 minutes to read • Edit Online

Communications Credits are a convenient way to pay for Phone System and Calling Plans in Microsoft 365 or Office 365. Communication Credits helps ensure that you and your users are never caught without being able to:

- Dial in to Audio Conferencing meetings using toll-free dial-in phone numbers.
- Dial out from an Audio Conferencing meeting to add someone else from anywhere in the world.
- Dial out from an Audio Conferencing meeting to your mobile phone with the Skype for Business or Microsoft Teams app installed.
- Dial any international phone number when you have a **Domestic Calling Plan**.
- Dial out and pay per minute once you have exhausted your monthly minute allotment.

> **NOTE**
> If you're wondering how much it is and the rates, see the rates table on the Calling Plans page.

As admin, you can add funds manually or you can set up auto-recharge, which we **recommend**.

Auto-recharge automatically tops off your balance when it falls below the trigger amount you set. We recommend using auto-recharge so you don't have to remember to add funds manually. When your balance hits the trigger amount, funds are added automatically. If you don't choose auto-recharge, you run the risk of your balance falling below zero. At that point, you and your users won't be able to make toll-free calls or international calls.

You can update your payment options at any time. On the **Subscriptions** page, select **Communications Credits**, and make your updates.

Funds will be applied only to Communications Credits at Microsoft's published rates when the services are used. Any funds not used within twelve (12) months of the purchase date will expire and be forfeited.

> **TIP**
> We'll send you email notifications when funds are added via auto-recharge, when auto-recharge fails (for example, when a credit card expires), and when your balance falls below zero.

For more information, see What are Communications Credits?

Want to know about plans and pricing

You can see the plans and pricing by visiting one of the following links:

- Calling Plans
- Audio Conferencing plans
- Phone System plans

You can also see information by signing in to the Microsoft 365 admin center and going to **Billing** > **Subscriptions** > **Add subscriptions**.

To see a table with the license or licenses you will need for each feature, see Microsoft Teams add-on licensing.

Related topics

- Set up Skype for Business Online
- Set up Cloud Voicemail - Admin help
- Set up Calling Plans and Calling Plans for Microsoft 365 or Office 365

Microsoft Teams call flows

6/8/2020 • 24 minutes to read • Edit Online

TIP

Watch this session to learn how Teams leverages your network and how to plan for optimal network connectivity: Teams Network Planning.

Overview

This article describes how Teams uses Microsoft 365 or Office 365 call flows in various topologies. In addition, it describes unique Teams flows that are used for peer-to-peer media communication. The document describes these flows, their purpose, and their origin and termination on the network. For purposes of this article, assume the following:

- Flow X is used by the on-premises client to communicate with the Microsoft 365 or Office 365 service in the cloud. It originates from the customer network, and it terminates as an endpoint in Microsoft 365 or Office 365.
- Flow Y is used by the on-premises client to communicate with a service on the Internet that Microsoft 365 or Office 365 has a dependency on. It originates from the customer network, and it terminates as an endpoint on the Internet.

This article covers the following information:

- **Background**. Provides background information such as networks that the flows may traverse, types of traffic, connectivity guidance from the customer network to Microsoft 365 or Office 365 service endpoints, interoperability with third-party components, and principles that are used by Teams to select media flows.
- **Call flows in various topologies**. Illustrates the use of call flows in various topologies. For each topology, the section enumerates all supported flows and illustrates how these flows are used in several use cases. For each use case, it describes the sequence and selection of flows using a flow diagram.
- **Teams with Express Route optimization**. Describes how these flows are used when Express Route is deployed for optimization, illustrated using a simple topology.

Background

Network segments

Customer network. This is the network segment that you control and manage. This includes all customer connections within customer offices, whether wired or wireless, connections between office buildings, connections to on-premises datacenters, and your connections to Internet providers, Express Route, or any other private peering.

Typically, a customer network has several network perimeters with firewalls and/or proxy servers, which enforce your organization's security policies, and that only allow certain network traffic that you have set up and configured. Because you manage this network, you have direct control over the performance of the network, and we recommend that you complete network assessments to validate performance both within sites in your network and from your network to the Microsoft 365 or Office 365 network.

Internet. This is the network segment that is part of your overall network that will be used by users who are

connecting to Microsoft 365 or Office 365 from outside of the customer network. It is also used by some traffic from the customer network to Microsoft 365 or Office 365.

Visited or guest private network. This is the network segment outside your customer network, but not in the public Internet, that your users and their guests may visit (for example, a home private network or an enterprise private network, that does not deploy Teams, where your users and their customers that interact with Teams services may reside).

> **NOTE**
> Connectivity to Microsoft 365 or Office 365 is also applicable to these networks.

Microsoft 365 or Office 365. This is the network segment that supports Microsoft 365 or Office 365 services. It is distributed worldwide with edges in proximity to the customer network in most locations. Functions include Transport Relay, conferencing server, and Media Processor.

Express Route (optional). This is the network segment that is part of your overall network that will give you a dedicated, private connection to the Microsoft 365 or Office 365 network.

Types of traffic

Real-time media. Data encapsulated within Real-time Transport Protocol (RTP) that supports audio, video, and screen sharing workloads. In general, media traffic is highly latency sensitive, so you would want this traffic to take the most direct path possible, and to use UDP versus TCP as the transport layer protocol, which is the best transport for interactive real time media from a quality perspective. (Note that as a last resort, media can use TCP/IP and also be tunneled within the HTTP protocol, but it is not recommended due to bad quality implications.) RTP flow is secured using SRTP, in which only the payload is encrypted.

Signaling. The communication link between the client and server, or other clients that are used to control activities (for example, when a call is initiated), and deliver instant messages. Most signaling traffic uses the HTTPS-based REST interfaces, though in some scenarios (for example, connection between Microsoft 365 or Office 365 and a Session Border Controller) it uses SIP protocol. It's important to understand that this traffic is much less sensitive to latency but may cause service outages or call timeouts if latency between the endpoints exceeds several seconds.

Connectivity to Microsoft 365 or Office 365

Teams requires connectivity to the Internet. Teams endpoint URLs and IP address ranges are listed in Office 365 URLs and IP address ranges. (Note that open connectivity to TCP ports 80 and 443, and to UDP ports 3478 through 3481, is required.) Furthermore, Teams has a dependency on Skype for Business Online, which must also be connected to the Internet.

Teams media flows connectivity is implemented using standard IETF Interactive Connectivity Establishment (ICE) procedures.

Interoperability restrictions

Third-party media relays. A Teams media flow (that is, where one of the media endpoints is Teams) may traverse only Teams or Skype for Business native media relays. Interoperability with a third-party media relay is not supported. (Note that a third-party SBC on the boundary with PSTN must terminate RTP/RTCP stream, secured using SRTP, and not relay it to the next hop.)

Third-party SIP proxy servers. A Teams signaling SIP dialog with a third-party SBC and/or gateway may traverse Teams or Skype for Business native SIP proxies. Interoperability with a third-party SIP proxy is not supported.

Third-party B2BUA (or SBC). A Teams media flow to and from the PSTN is terminated by a third-party SBC. However, interoperability with a third-party SBC within the Teams network (where a third-party SBC mediates two Teams or Skype for Business endpoints) is not supported.

Technologies that are not recommended with Microsoft Teams

VPN network. It is not recommended for media traffic (or flow 2'). The VPN client should use split VPN and route media traffic like any external non-VPN user, as specified in Enabling Lync media to bypass a VPN tunnel.

> **NOTE**
> Although the title indicates Lync, it is applicable to Teams as well.

Packet shapers. Any kind of packet snippers, packet inspection, or packet shaper devices are not recommended and may degrade quality significantly.

Principles

There are four general principles that help you understand call flows for Microsoft Teams:

- A Microsoft Teams conference is hosted by Microsoft 365 or Office 365 in the same region where the first participant joined. (Note that if there are exceptions to this rule in some topologies, they will be described in this document and illustrated by an appropriate call flow.)
- A Teams media endpoint in Microsoft 365 or Office 365 is used based on media processing needs and not based on call type. (For example, a point-to-point call may use a media endpoint in the cloud to process media for transcription or recording, while a conference with two participants may not use any media endpoint in the cloud.) However, most conferences will use a media endpoint for mixing and routing purposes, allocated where the conference is hosted. The media traffic sent from a client to the media endpoint may be routed directly or use a Transport Relay in Microsoft 365 or Office 365 if required due to customer network firewall restrictions.
- Media traffic for peer-to-peer calls take the most direct route that is available, assuming that the call doesn't mandate a media endpoint in the cloud (see previous principle). The preferred route is direct to the remote peer (client), but if that route isn't available, then one or more Transport Relays will relay traffic. It is recommended that media traffic shall not transverse servers such as packet shapers, VPN servers, and so on, since this will impact the media quality.
- Signaling traffic always goes to the closest server to the user.

To learn more about the details on the media path that is chosen, see Understanding Media Flows in Microsoft Teams - BRK4016.

Call flows in various topologies

Teams topology

This topology is used by customers that leverage Teams services from the cloud without any on-premises deployment, such as Skype for Business Server or Phone System Direct Routing. In addition, the interface to Microsoft 365 or Office 365 is done over the Internet without Azure Express Route.

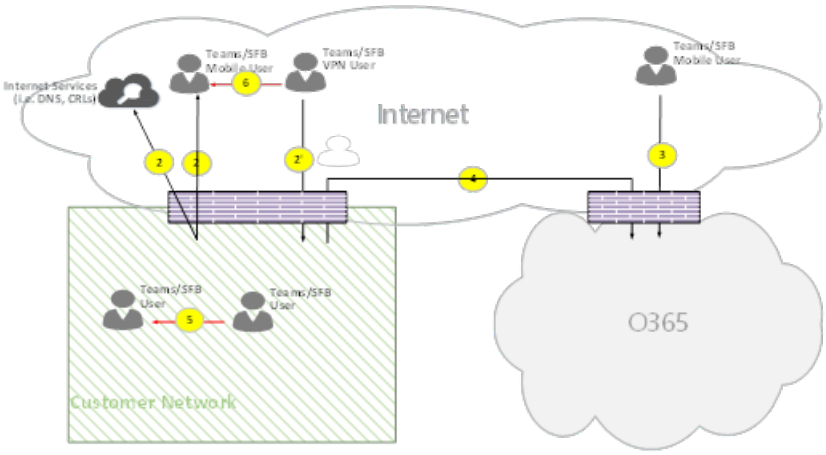


Figure 1 - Teams topology

Note that:

- The direction of the arrows on the diagram above reflect the initiation direction of the communication that affects connectivity at the enterprise perimeters. In the case of UDP for media, the first packet(s) may flow in the reverse direction, but these packets may be blocked until packets in the other direction will flow.
- Teams is deployed side by side with Skype for Business Online, hence clients are displayed as "Teams/SFB user."

You can find more information on the following optional topologies later in the article:

- Skype for Business on-premises deployment is described in **Teams hybrid topology**.
- Phone System Direct Routing (for PSTN connectivity) is described in **Teams with Direct Routing topology**.
- Express Route is described in **Teams with Express Route optimization**.

Flow descriptions:

- **Flow 2** – Represents a flow initiated by a user on the customer network to the Internet as a part of the user's Teams experience. Examples of these flows are DNS and peer-to-peer media.
- **Flow 2'** – Represents a flow initiated by a remote mobile Teams user, with VPN to the customer network.
- **Flow 3** – Represents a flow initiated by a remote mobile Teams user to Microsoft 365 or Office 365/Teams endpoints.
- **Flow 4** – Represents a flow initiated by a user on the customer network to Microsoft 365 or Office 365/Teams endpoints.
- **Flow 5** – Represents a peer-to-peer media flow between a Teams user and another Teams or Skype for Business user within the customer network.
- **Flow 6** – Represents a peer-to-peer media flow between a remote mobile Teams user and another remote mobile Teams or Skype for Business user over the Internet.

Use case: One-to-one

One-to-one calls use a common model in which the caller will obtain a set of candidates consisting of IP addresses/ports, including local, relay, and reflexive (public IP address of client as seen by the relay) candidates. The caller sends these candidates to the called party; the called party also obtains a similar set of candidates and sends them to the caller. STUN connectivity check messages are used to find which caller/called party media paths work, and the best working path is selected. Media (that is, RTP/RTCP packets secured using SRTP) are then sent using the selected candidate pair. The Transport relay is deployed as part of Microsoft 365 and Office 365.

If the local IP address/port candidates or the reflexive candidates have connectivity, then the direct path between the clients (or using a NAT) will be selected for media. If the clients are both on the customer network, then the direct path should be selected. This requires direct UDP connectivity within the customer network. If the clients are both nomadic cloud users, then depending on the NAT/firewall, media may use direct connectivity.

If one client is internal on the customer network and one client is external (for example, a mobile cloud user), then it

is unlikely that direct connectivity between the local or reflexive candidates is working. In this case, an option is to use one of the Transport Relay candidates from either client (for example, the internal client obtained a relay candidate from the Transport relay in Microsoft 365 or Office 365; the external client needs to be able to send STUN/RTP/RTCP packets to the transport relay). Another option is the internal client sends to the relay candidate obtained by the mobile cloud client. Note that, although UDP connectivity for media is highly recommended, TCP is supported.

High-level steps:

1. Teams User A resolves URL domain name (DNS) using flow 2.
2. Teams User A allocates a media Relay port on Teams Transport Relay using flow 4.
3. Teams User A sends "invite" with ICE candidates using flow 4 to Microsoft 365 or Office 365.
4. Microsoft 365 or Office 365 sends notification to Teams User B using flow 4.
5. Teams User B allocates a media Relay port on Teams Transport Relay using flow 4.
6. Teams User B sends "answer" with ICE candidates using flow 4, which is forwarded back to Teams User A using Flow 4.
7. Teams User A and Teams User B invoke ICE connectivity tests and the best available media path is selected (see diagrams below for various use cases).
8. Teams Users send telemetry to Microsoft 365 or Office 365 using flow 4.

Within customer network:

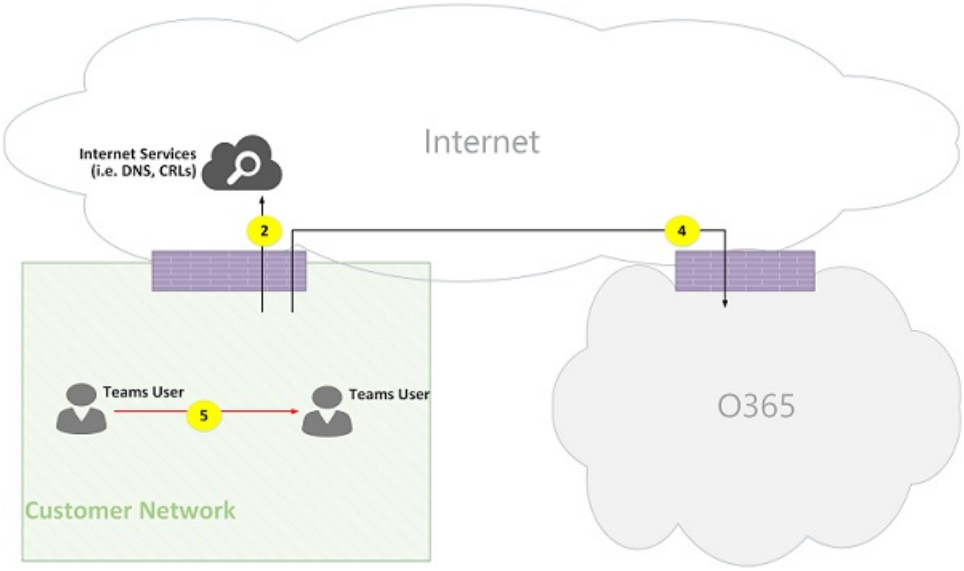


Figure 2 - Within customer network

In step 7, peer-to-peer media flow 5 is selected.

Media is bidirectional. The direction of flow 5 indicates that one side initiates the communication from a connectivity perspective, consistent with all the flows in this document. In this case, it doesn't matter which direction is used because both endpoints are within the customer network.

Customer network to external user (media relayed by Teams Transport Relay):

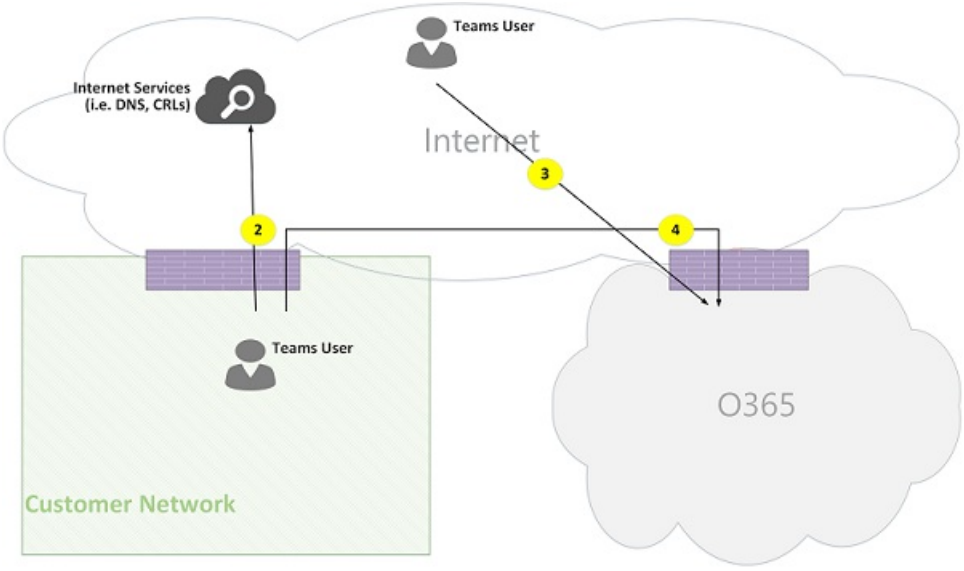


Figure 3 - Customer network to external user (media relayed by Teams Transport Relay)

In step 7, flow 4, from customer network to Microsoft 365 or Office 365, and flow 3, from remote mobile Teams user to Microsoft 365 or Office 365, are selected. These flows are relayed by Teams Transport Relay within Microsoft 365 or Office 365.

Media is bidirectional, where direction indicates which side initiates the communication from a connectivity perspective. In this case, these flows are used for signaling and media, using different transport protocols and addresses.

Customer network to external user (direct media):

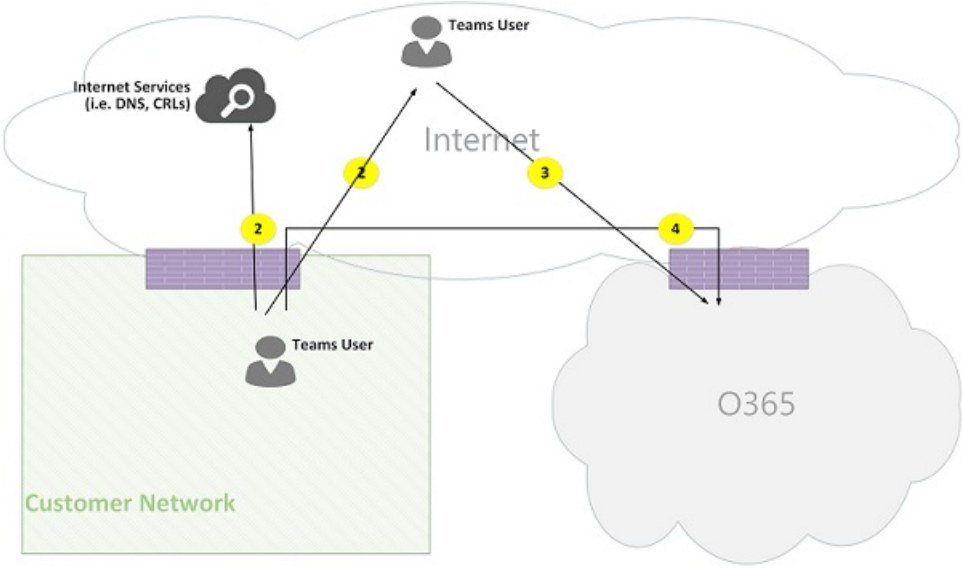


Figure 4 - Customer network to external user (direct media)

In step 7, flow 2, from customer network to the Internet (client's peer), is selected.

- Direct media with remote mobile user (not relayed through Microsoft 365 or Office 365) is optional. In other words, customer may block this path to enforce a media path through Transport Relay in Microsoft 365 or Office 365.
- Media is bidirectional. The direction of flow 2 to remote mobile user indicates that one side initiates the communication from a connectivity perspective.

VPN user to internal user (media relayed by Teams Transport Relay)

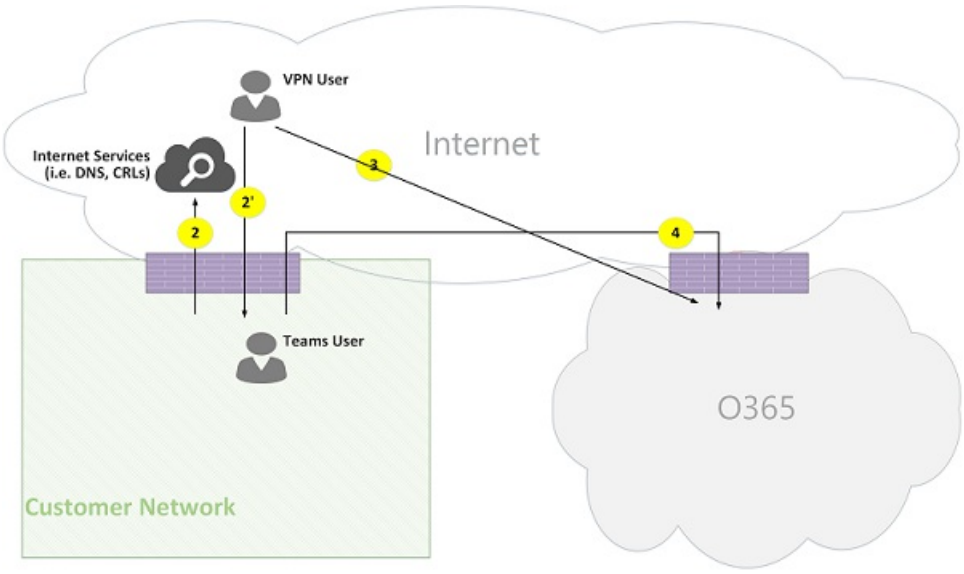


Figure 5 - VPN user to internal user (media relayed by Teams Transport Relay)

Signaling between the VPN to the customer network is using flow 2'. Signaling between the customer network and Microsoft 365 or Office 365 is using flow 4. However, media bypasses the VPN and is routed using flows 3 and 4 through Teams media relay in Microsoft 365 or Office 365.

VPN user to internal user (direct media)

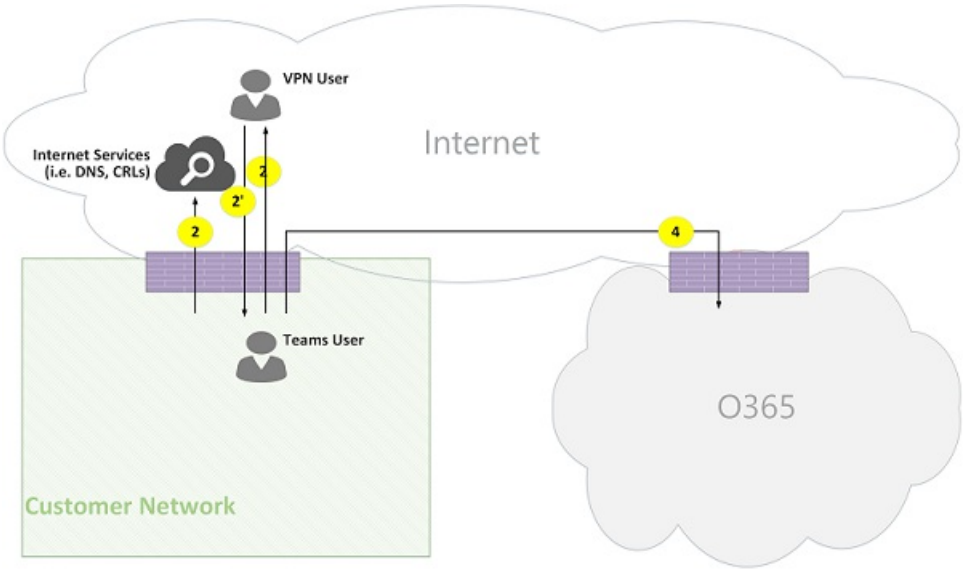


Figure 6 - VPN user to internal user (direct media)

Signaling between the VPN to the customer network is using flow 2'. Signaling between the customer network and Microsoft 365 or Office 365 is using flow 4. However, media bypasses the VPN and is routed using flow 2 from the customer network to the Internet.

Media is bidirectional. The direction of flow 2 to the remote mobile user indicates that one side initiates the communication from a connectivity perspective.

VPN user to external user (direct media)

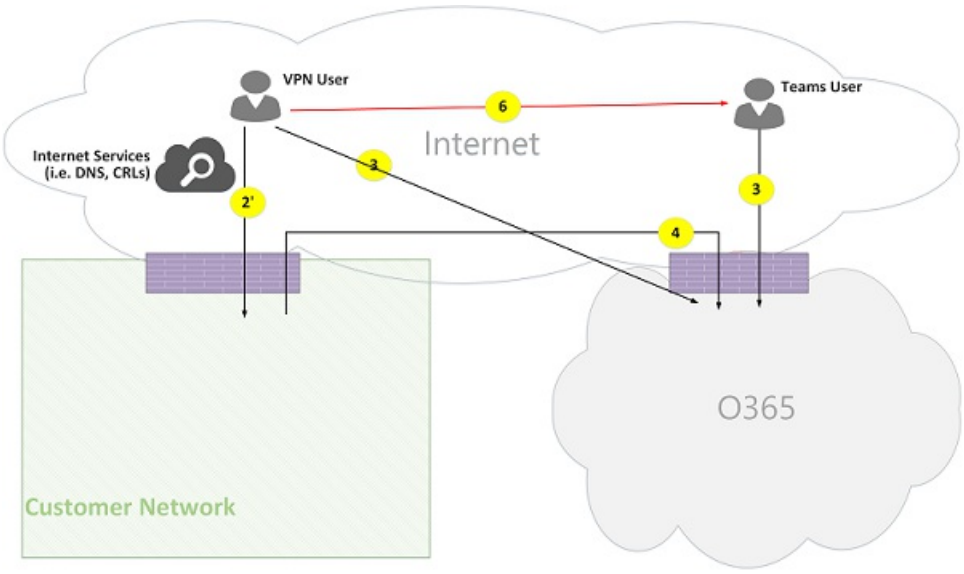


Figure 7 - VPN user to external user (direct media)

Signaling between the VPN user to the customer network is using flow 2' and using flow 4 to Microsoft 365 or Office 365. However, media bypasses VPN and is routed using flow 6.

Media is bidirectional. The direction of flow 6 to the remote mobile user indicates that one side initiates the communication from a connectivity perspective.

Use Case: Teams to PSTN through Microsoft 365 or Office 365 Trunk

Microsoft 365 and Office 365 have a Phone System that allows placing and receiving calls from the Public Switched Telephone Network (PSTN). If the PSTN trunk is connected using the Phone System Calling Plan, then there are no special connectivity requirements for this use case. (If you want to connect your own on-premises PSTN trunk to Microsoft 365 or Office 365, you can use Phone System Direct Routing.)

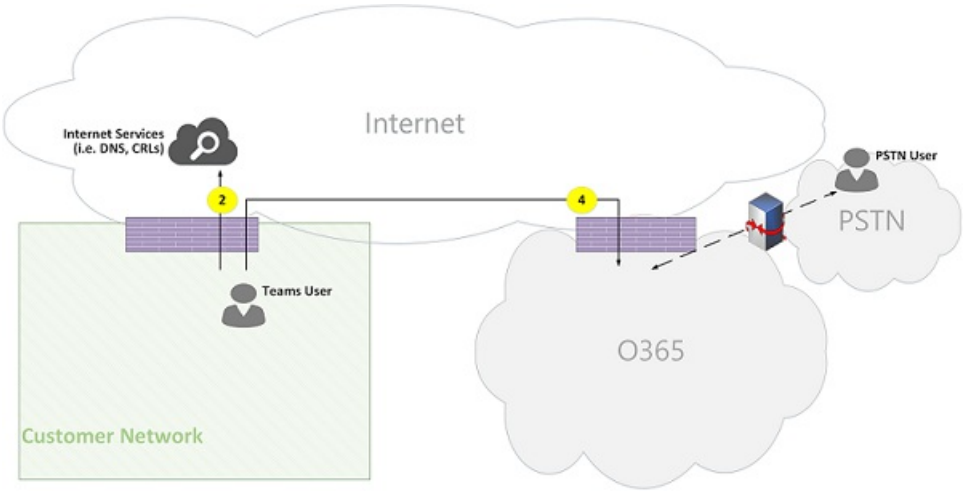


Figure 8 - Teams to PSTN through Office 365 Trunk

Use case: Teams meeting

The audio/video/screen sharing (VBSS) conferencing server is part of Microsoft 365 and Office 365. It has a public IP address that must be reachable from the customer network and must be reachable from a Nomadic Cloud client. Each client/endpoint needs to be able to connect to the conferencing server.

Internal clients will obtain local, reflexive, and relay candidates in the same manner as described for one-to-one calls. The clients will send these candidates to the conferencing server in an invite. The conferencing server does not use a relay since it has a publicly reachable IP address, so it responds with its local IP address candidate. The client and conferencing server will check connectivity in the same manner described for one-to-one calls.

Note that:

- Teams clients cannot join Skype for Business meetings, and Skype for Business clients cannot join Teams meetings.
- A PSTN user optionally "Dials IN" or is "Dialed OUT", depending on the meeting's organizer PSTN Calling and/or conferencing provisioning.
- A guest user or a customer user may join from a guest private network, which is protected using FW/NAT with strict rules.

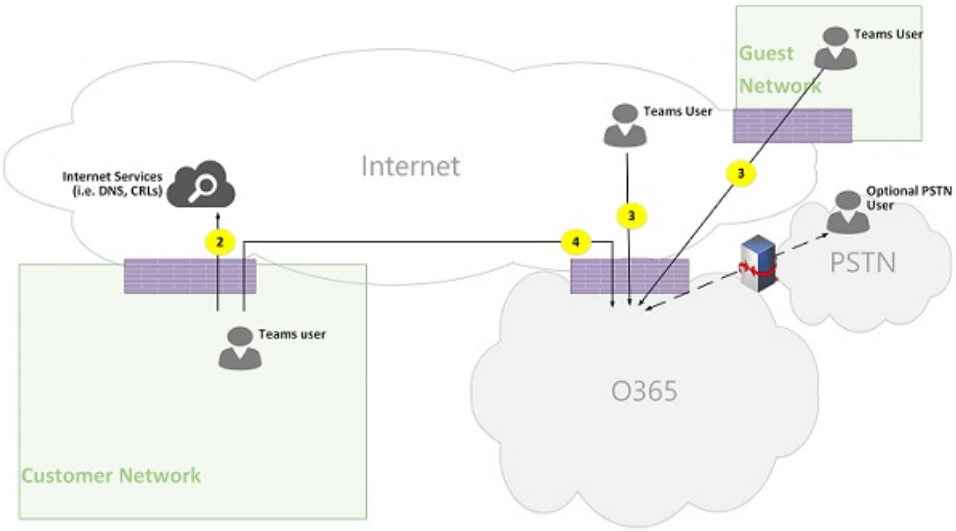


Figure 9 - Teams Meeting

Use case: Federation with Skype for Business on premises

Media relayed by Teams Transport Relay in Microsoft 365 or Office 365

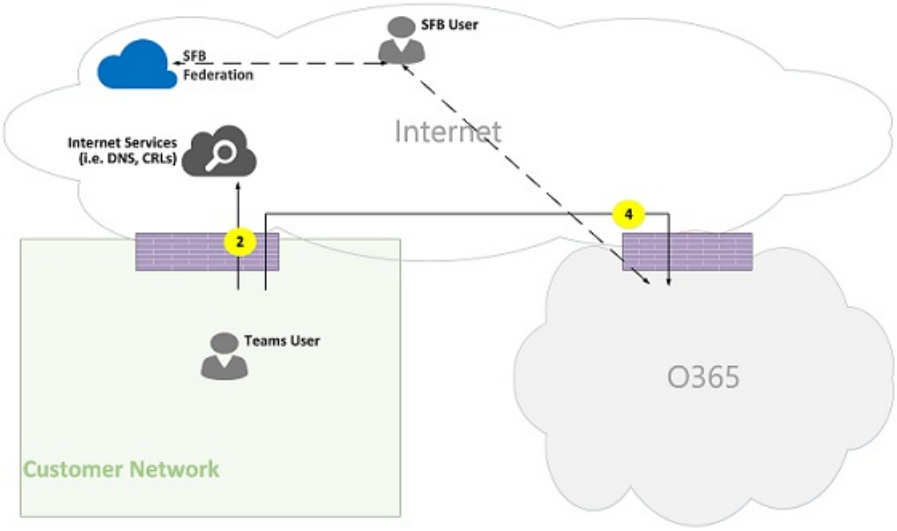


Figure 10 - Media relayed by Teams Transport Relay in Office 365

Note that:

- Federation is, by definition, a communication between two tenants. In this case, tenant A, which uses Teams, federates with tenant B, which uses Skype for Business on premises. If tenant B is also using Microsoft 365 or Office 365, then the Skype for Business client would have used flow 3 to connect with Microsoft 365 or Office 365.
- Signaling and media from the federated Skype for Business client to on-premises Skype for Business Server is out of scope of this document. However, it is illustrated here for clarity.
- Signaling between Teams and Skype for Business is bridged by a gateway.
- Media in this case is relayed by Teams Transport Relay to the customer network and remote Skype for

Business client using flow 4.

Media relayed by Skype for Business Media Relay in federated tenant

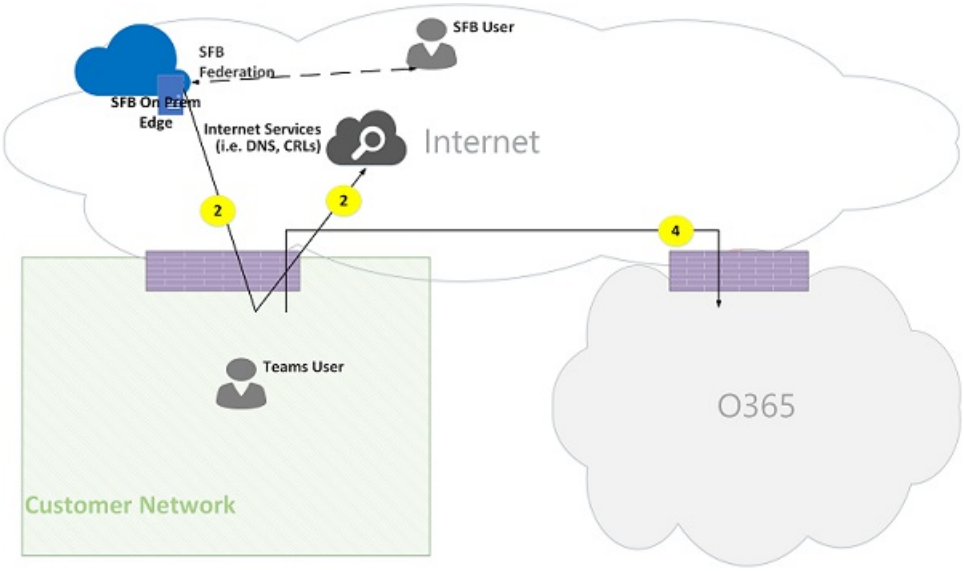


Figure 11 - Media relayed by Skype for Business Media Relay in federated tenant

Note that:

- Signaling and media from the federated Skype for Business client to an on-premises Skype for Business Server is out of scope of this document. However, it is illustrated here for clarity.
- Signaling between Teams and Skype for Business is bridged by a Gateway.
- Media in this case is relayed by Skype for Business on-premises Media Relay to the customer network using flow 2. (Note that traffic from Teams user to the remote Media Relay in the federated customer network will be initially blocked by the Media Relay until traffic in the reverse direction starts to flow. However, the bidirectional flow will open connectivity in both directions.)

Direct (peer-to-peer)

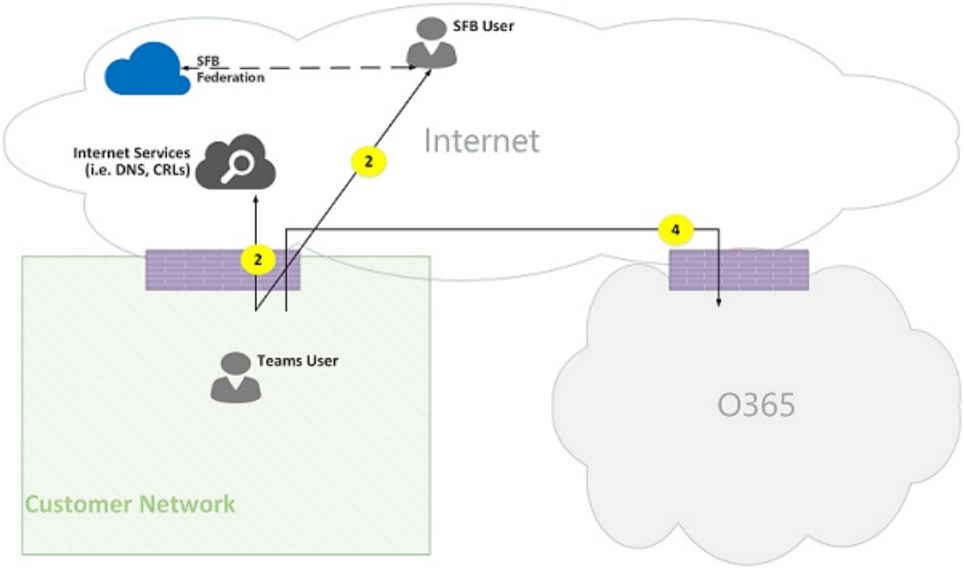


Figure 12 - Direct (peer-to-peer)

Teams hybrid topology

This topology includes Teams with a Skype for Business on-premises deployment.

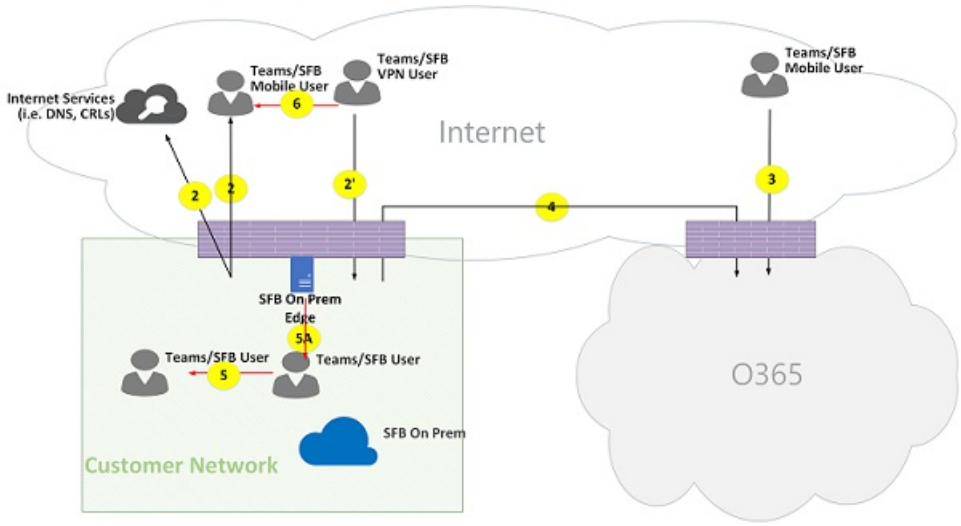


Figure 13 - Teams hybrid topology

- The direction of the arrows on the diagram above reflect the initiation direction of the communication that affects connectivity at the enterprise perimeters. In the case of UDP for media, the first packet(s) may flow in the reverse direction, but these packets may be blocked until packets in the other direction will flow.
- Teams is deployed side by side with Skype for Business Online, hence clients are displayed as "Teams/SFB user."

Additional flow (on top of Teams topology):

- **Flow 5A** – Represents a peer-to-peer media flow between a Teams user within the customer network and a Skype for Business on-premises media relay at the customer network edge.

Use case: Teams to Skype for Business one-to-one

Hybrid within the customer network

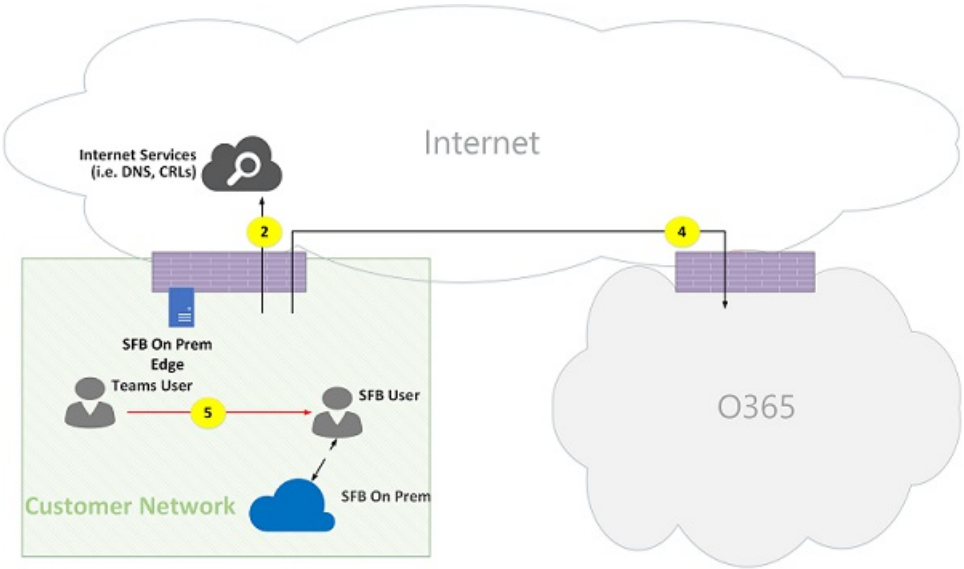


Figure 14 - Hybrid within customer network

Signaling between Teams and Skype for Business is bridged by a gateway. However, media is routed directly peer-to-peer within the customer network using flow 5.

Hybrid customer network with external Skype for Business user – relayed by Microsoft 365 or Office 365

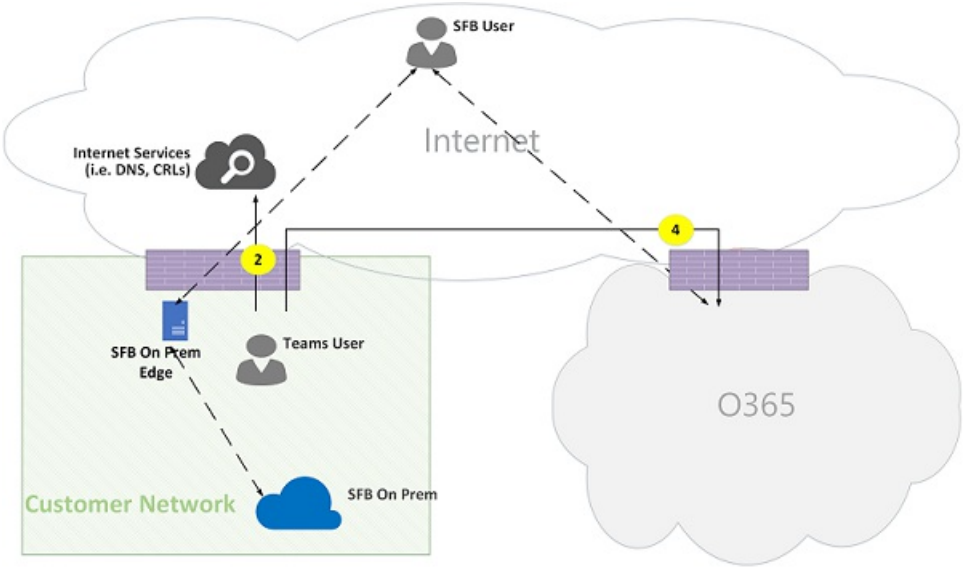


Figure 15 - Hybrid customer network with external Skype for Business user - relayed by Office 365

Note that:

- Signaling and media from the Skype for Business client to an on-premises Skype for Business Server is out of scope of this document. However, it is illustrated here for clarity.
- Signaling between Teams and Skype for Business is bridged by a gateway.
- Media is relayed through Teams Transport Relay to the customer network through flow 4.

Hybrid customer network with external Skype for Business user – relayed by on-premises Edge

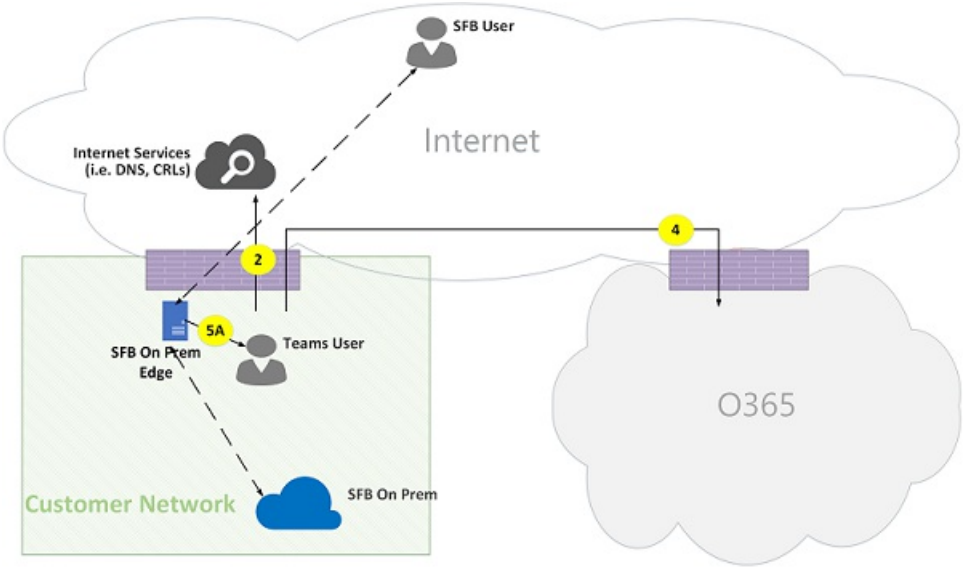


Figure 16 - Hybrid customer network with external Skype for Business user - relayed by on-premises Edge

Note that:

- Signaling and media from Skype for Business client to an on-premises Skype for Business Server is out of scope of this document. However, it is illustrated here for clarity.
- Signaling is bridged by a gateway.
- Media is relayed by Skype for Business Media Relay within Skype for Business on-premises Edge to Teams user within the customer network using media flow 5A.

Teams with Phone System Direct Routing topology

This topology includes Teams with Phone System Direct Routing.

Direct Routing enables you to use a third-party Public Switched Telephone Network (PSTN) service provider by pairing a supported on-premises customer-owned Session Border Controller (SBC) hardware device to Microsoft 365 or Office 365, and then connecting the telephony trunk to that device.

To support this scenario, the customer must deploy a certified SBC for Direct Routing from one of Microsoft's certified partners. The SBC must be configured as recommended by the vendor, and be routable from Microsoft 365 or Office 365 for direct UDP traffic. The media may flow directly from Teams and/or the Skype for Business client to the SBC (bypassing the Teams gateway) or traverse through the Teams gateway. The connectivity with the SBC, when the trunk is configured to bypass the Teams gateway, is based on ICE, where SBC supports ICE-Lite, while the Teams/Skype for Business media endpoint supports ICE Full Form.

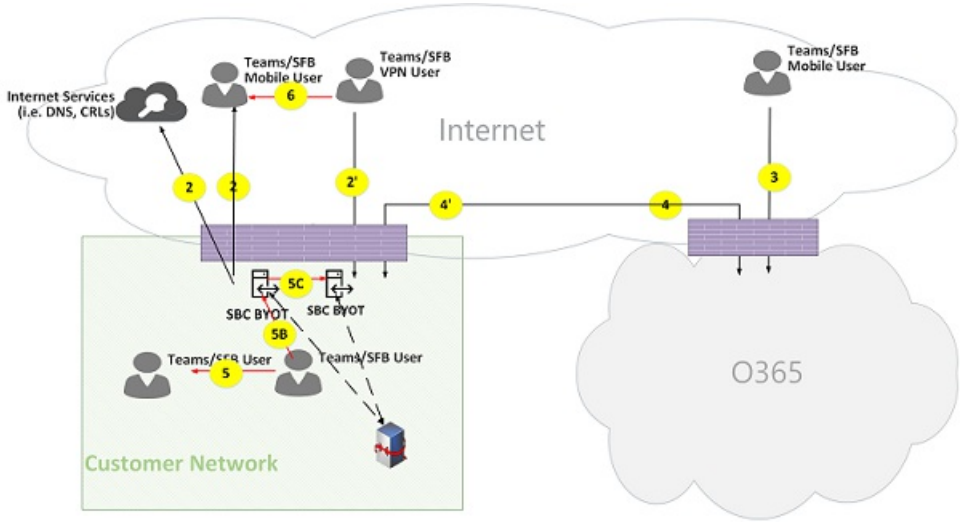


*Figure 17 - Teams with Phone System Direct Routing topology

Note that:

- The direction of the arrows on the diagram above reflect the initiation direction of the communication that affects connectivity at the enterprise perimeters. In the case of UDP for media, the first packet(s) may flow in the reverse direction, but these packets may be blocked until packets in the other direction will flow.
- Teams is deployed side by side with Skype for Business Online, hence clients are displayed as "Teams/SFB user."

Additional flows (on top of Teams online topology):

- **Flow 4'** - Represents a flow from Microsoft 365 or Office 365 to the customer network, used to establish a connection between the Teams media server in the cloud with the SBC on premises.
- **Flow 5B** – Represents a media flow between the Teams user within the customer network with the Direct Routing SBC in bypass mode.
- **Flow 5C** – Represents a media flow between the Direct Routing SBC to another Direct Routing SBC in a PSTN hairpin call bypass mode.

Internal user with Direct Routing (media relayed by Teams Transport Relay)

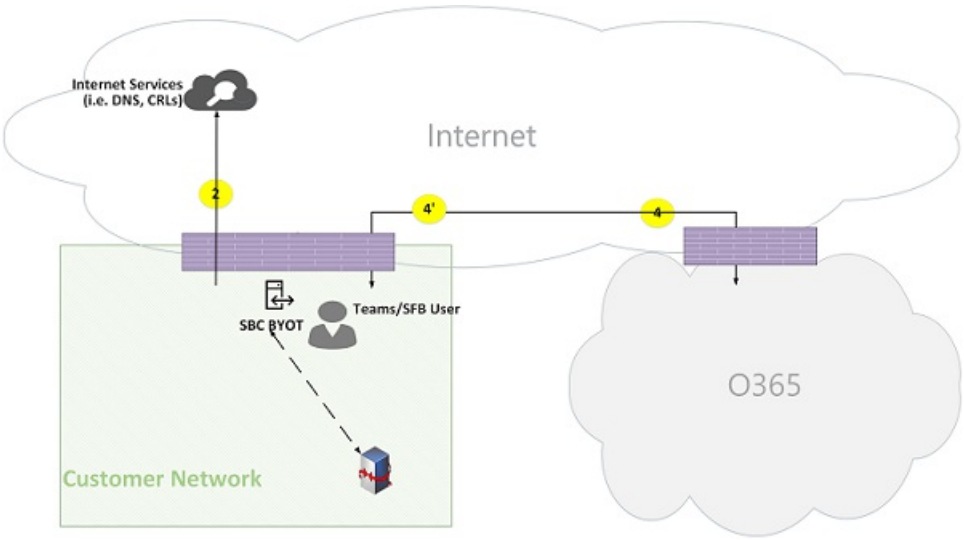


Figure 18 - Internal user with Direct Routing (media relayed by Teams Transport Relay)

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365.
- Signaling and media from the SBC to Microsoft 365 or Office 365 and vice versa use flow 4 and/or flow 4'.
- Signaling and media from the client within the customer network to Microsoft 365 or Office 365 use flow 4.

Remote user with Direct Routing (media is routed through a media server (MP))

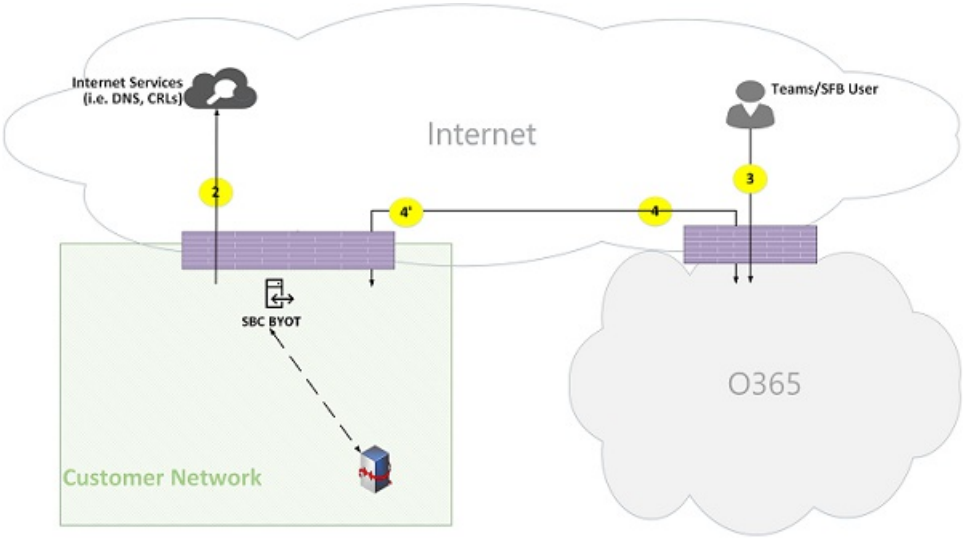


Figure 19 - Remote user with Direct Routing (media is routed through a media server (MP))

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365.
- Signaling and media from the SBC to Microsoft 365 or Office 365 and vice versa use flow 4 and/or flow 4'.
- Signaling and media from the client on the Internet to Microsoft 365 or Office 365 use flow 3.

Internal user Direct Routing (media bypass)

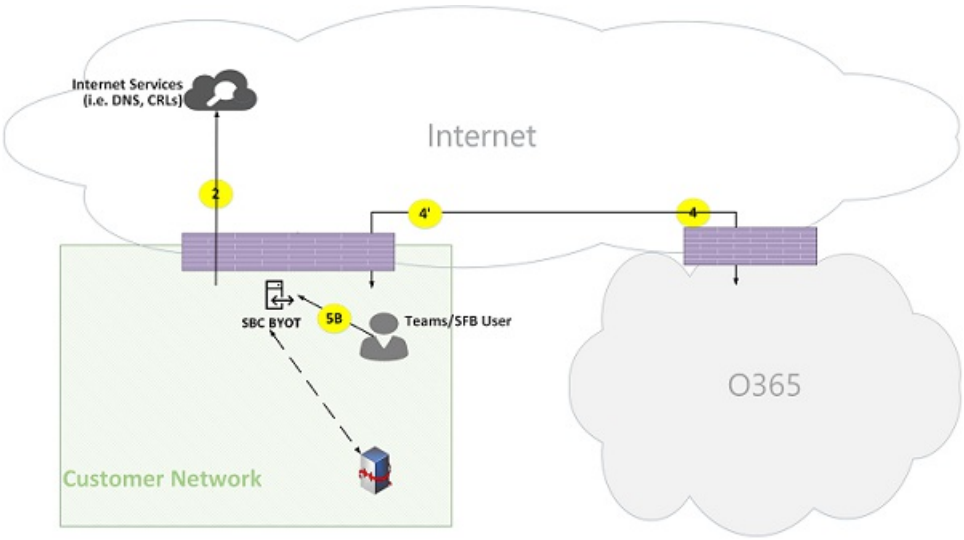


Figure 20 - Internal user Direct Routing (media bypass)

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365.
- Signaling from SBC to Microsoft 365 or Office 365 and vice versa use flow 4 and/or flow 4'.
- Signaling from client within the customer network to Microsoft 365 or Office 365 use flow 4.
- Media from client within the customer network to SBC within the customer network use flow 5B.

Remote user with Direct Routing (media bypass relayed by Teams Transport Relay)

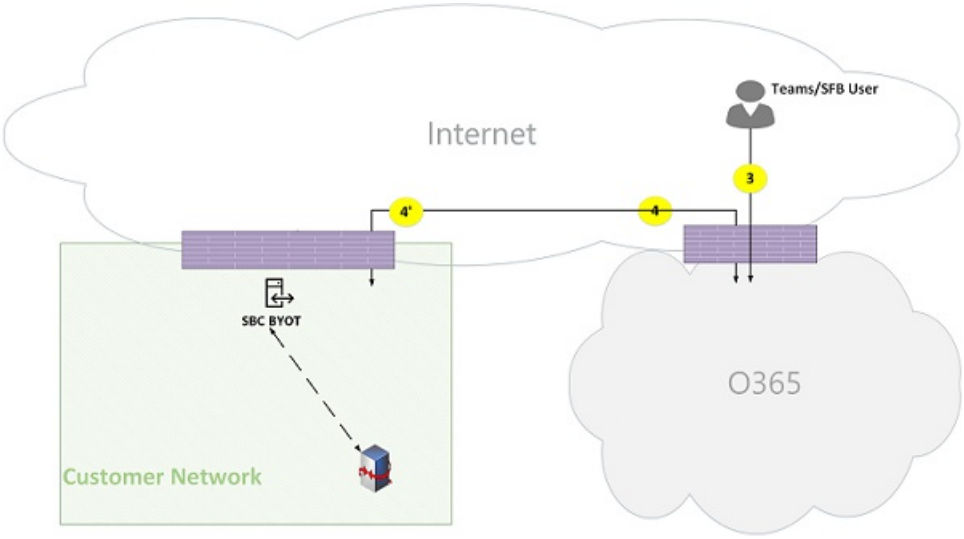


Figure 21 - Remote user with Direct Routing (media bypass relayed by Teams Transport Relay)

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365 and Internet.
- Signaling from the SBC to Microsoft 365 or Office 365 and vice versa uses flow 4 and/or flow 4'.
- Signaling from the client on the Internet to Microsoft 365 or Office 365 uses flow 3.
- Media from the client on the Internet to the SBC within the customer network uses flows 3 and 4, relayed by Teams Transport Relay.

Remote user Direct Routing (media bypass direct)

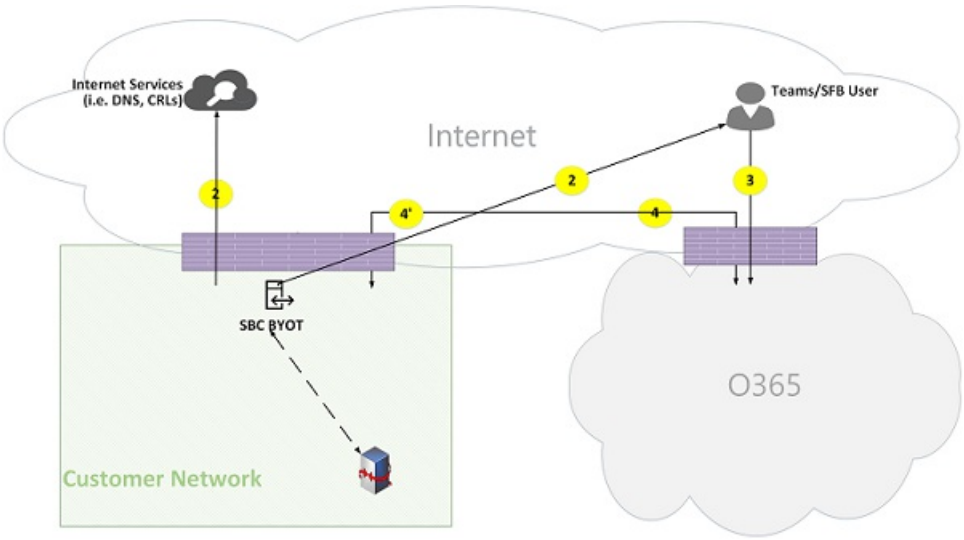


Figure 22 - Remote user Direct Routing (media bypass direct)

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365 and the Internet.
- Signaling from the SBC to Microsoft 365 or Office 365 and vice versa uses flow 4 and/or flow 4'.
- Signaling from the client on the Internet to Microsoft 365 or Office 365 uses flow 3.
- Media from the client on the Internet to the SBC within the customer network uses flow 2.

Direct Routing (media bypass) – PSTN hairpin call (due to call forward/transfer)

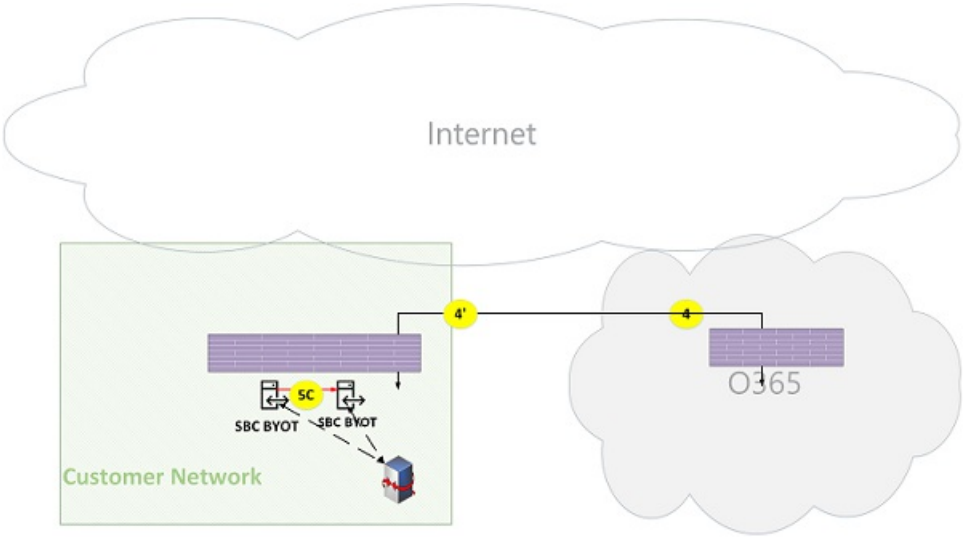


Figure 23 - Direct Routing (media bypass) - PSTN hairpin call (due to call forward/transfer)

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365.
- Signaling from the SBC to Microsoft 365 or Office 365 and vice versa uses flow 4 and/or flow 4'.
- The client is out of the signaling and media loop after the call is hairpinned from PSTN to PSTN.
- Media from SBC instance A within the customer network to SBC instance B within the customer network (where, A and B can be the same instance) uses flow 5C.

Direct Routing (media through Microsoft 365 or Office 365) – PSTN hairpin call across two tenants

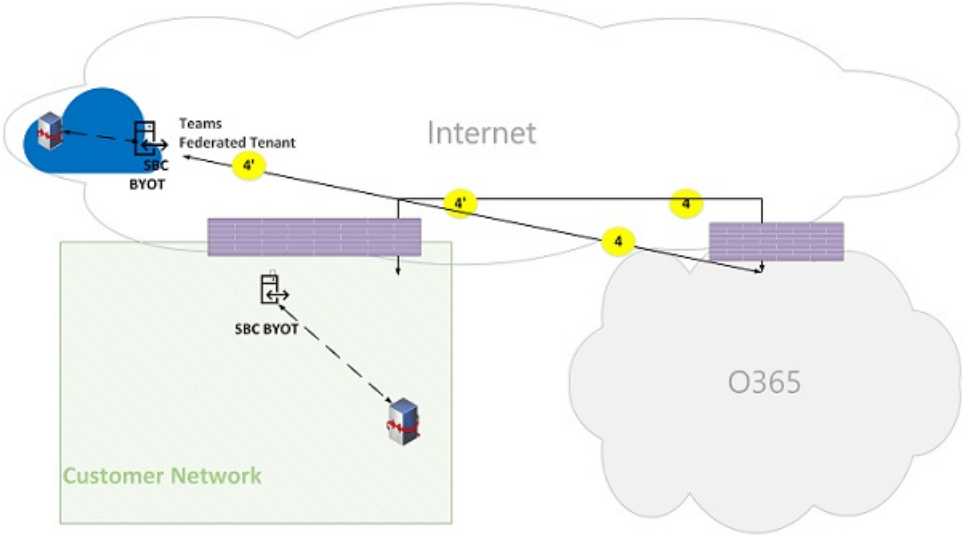


Figure 24 - Direct Routing (media through Microsoft 365 or Office 365) – PSTN hairpin call across two tenants

Note that:

- The SBC must have a public IP address that is routable from Microsoft 365 or Office 365.
- Signaling from the SBC to Microsoft 365 or Office 365 and vice versa uses flow 4 and/or flow 4'.
- The client is out of the signaling and media loop after the call is hairpinned from PSTN to PSTN.
- Media from SBC instance A within the customer network X to SBC instance B must be relayed through the Microsoft 365 or Office 365 Media Server and can't use bypass mode.

Teams with Express Route optimization

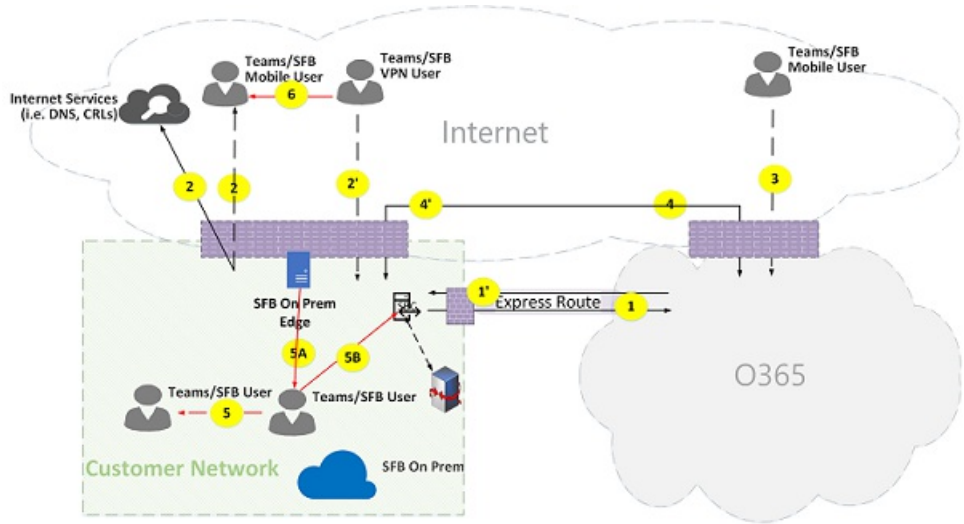


Figure 25 - Teams with Express Route optimization

In the case that Express Route is justified and deployed, then Teams flows could be re-routed from flow 4 to flow 1 and from flow 4' to flow 1'. However, the Teams application has a hard dependency on other Microsoft 365 or Office 365 flows over the Internet using flows 4 and 4'; hence these flows must not be blocked.

Note that Skype for Business hybrid Edge traffic is routed to the Internet and not to Express Route to communicate with external users and federate with other tenants.

To prevent asymmetrical flows, re-routing must be in both directions. In other words, an address within the customer network is routable either through Internet or Express Route, based on optimization, but not through both.

Customer network to external user (media relayed by Teams Transport Relay):

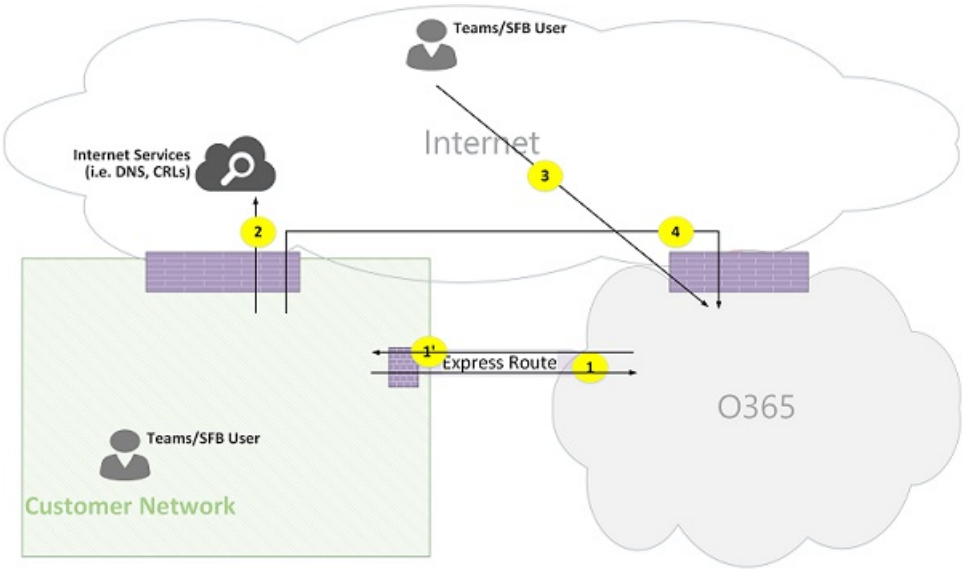


Figure 26 - Customer network to external user (media relayed by Teams Transport Relay)

High Level Steps:

1. Teams User within customer network resolves URL domain name (DNS) using flow2.
2. Teams User within customer network allocates a media Relay port on Teams Transport Relay using flow 1.
3. Teams User within customer network sends "invite" with ICE candidates using flow 1 to Microsoft 365 or Office 365.
4. Microsoft 365 or Office 365 sends notification to external Teams user using flow 3.
5. Teams external user allocates a media Relay port on Teams Transport Relay using flow 3.
6. Teams external user sends "answer" with ICE candidates using flow 3, which is forwarded back to Teams user A using Flow 1.
7. Teams User A and Teams User B invoke ICE connectivity tests and selects flows 1 and 3, which are relayed by Teams Transport Relay.
8. Teams Users send telemetry to Microsoft 365 or Office 365 using flows 1 and 3.

> **NOTE**
> Flow 4 must be enabled to support dependencies of Teams application on other micro-services that mandates flow 4.

Plan my users' experience

6/8/2020 • 5 minutes to read • Edit Online

This article gives an overview of the requirements for properly identifying the elements of your cloud voice services deployment that directly affect your users' experience. By preparing for these items before deployment, you'll increase your chances of successfully delivering a high-quality, reliable experience for users.

Client deployment

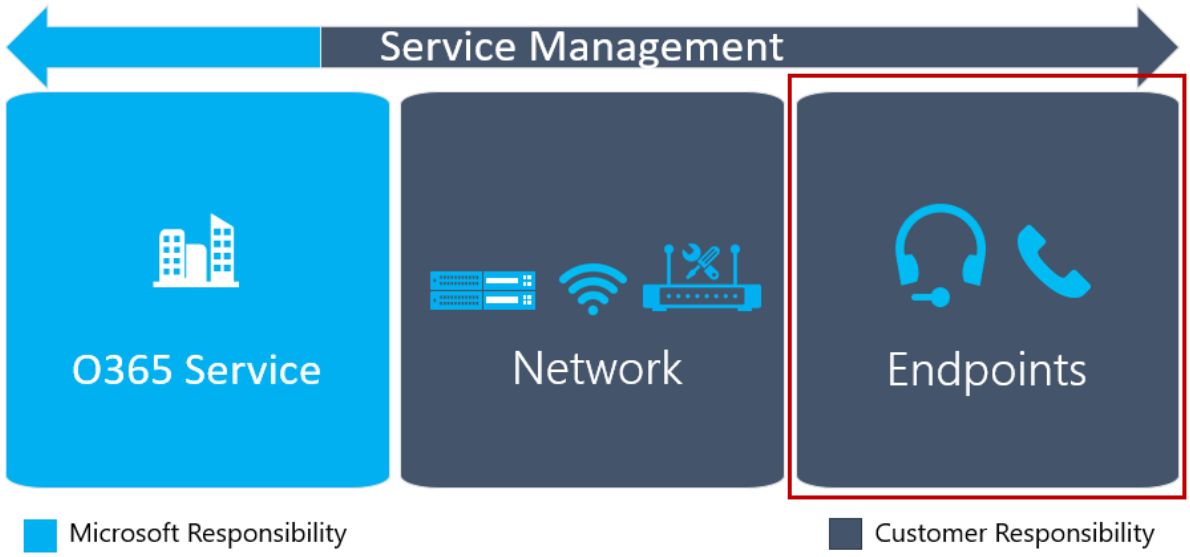
Microsoft Teams has clients available for web, desktop (Windows and Mac), and mobile (Android and iOS). For additional details about how the desktop (Windows and Mac) and mobile clients are installed, see Get clients for Microsoft Teams.

Client updates

One of the key benefits of Teams is that the client is kept up to date automatically. The clients on the PC and Mac are updated by using a background process that checks for new builds and downloads the new client when the app is idle.

Plan for endpoint quality

As you can see from the diagram below, endpoints are an important building block in providing a quality experience for users.



Teams endpoints can run on many devices, including PCs, Macs, tablets, and mobile devices. Part of the experience not only encompasses the device, but how a user connects to the device—for example, using the device's built-in mic/speaker, earbuds, or an optimized headset. Using an optimized headset can enrich the overall user experience.

The following guidance on endpoint planning will help you ensure your organization has a successful onboarding experience with Teams.

Endpoint capability

The first part of planning is to ensure all the PCs and other devices in your organization can run Teams. This

involves not just looking at the hardware requirements, but also understanding what else the PC is doing in the background. Many organizations run other software, including intrusion detection systems and antimalware software, which can affect the base performance of a device.

For information about the software requirements for Teams clients on each platform (web, desktop, and mobile), see Get clients for Microsoft Teams.

Endpoint firewalls

Client-side firewalls can have a significant impact on the user experience. Client-side firewalls can affect call quality in addition to preventing a call from being established. Configure the appropriate exclusions on the client firewall based on the information in Microsoft 365 or Office 365 URLs and IP address ranges. Your third-party vendor will have specific guidance on how to create the exclusions.

> **NOTE**
> Microsoft Teams will automatically update the Windows Firewall with an appropriate firewall configuration.

Wi-Fi recommendations for endpoints

It takes significant planning to deploy an optimized Wi-Fi network to support real-time workloads in Microsoft Teams. The following sections provide some general guidance that can help you avoid common pitfalls when planning for endpoints.

Wi-Fi drivers

Some Wi-Fi drivers can be problematic. As an example, a driver might have very aggressive roaming behaviors between access points, causing poor call quality. This isn't a common occurrence, but it's important to ensure that Wi-Fi drivers on the PC have been updated and tested prior to deployment.

Wi-Fi bands

There are primarily two types of bands used in Wi-Fi equipment today, 2.4 GHz and 5.0 GHz. If your organization provides both bands, you should configure your driver settings to prefer the 5.0 GHz band. This band is much denser in terms of throughput and is less affected by the interference seen in the 2.4 GHz band. This recommendation assumes that you've properly optimized the 5.0 GHz network band.

Wi-Fi radio type

Plan for devices that support the newer Wi-Fi radio types. You can get very good Wi-Fi performance if you leverage 802.11ac or newer on the devices you provision.

Wireless avoidance

Some organizations prefer to avoid Wi-Fi altogether. Sometimes this guidance is provided through a recommendation to users to connect directly to a wired network. In some cases, the network binding order might have the wireless connection preferred and continue to use that connection even though the PC is connected to the wired connection. To avoid this unintended behavior, configure the binding order to avoid this scenario.

802.11 Power Save protocol

If your organization uses wireless access points or routers that don't support the 802.11 Power Save protocol, you might experience dropped calls or poor call quality in Microsoft Teams running on Windows devices. If it's not possible to upgrade your wireless access point or routers, you should update Windows Power Plan settings on devices that run on battery power. Further detail and configuration guidance is provided in the following support article.

Decision points	• What Teams clients will be deployed in your organization? • How will you initially deploy Teams clients to your users? • Who is responsible for evaluating endpoints and devices to validate they meet Teams requirements for a quality experience?
Next steps	• Document the process that will be followed to deploy Teams clients. • Evaluate endpoints and devices and perform and remediation required.

Devices for Teams

Microsoft Teams can be used for meetings or as a phone system. When using these features, the interface device that is used for Teams plays an important role in the user experience.

Using a built-in PC speaker and microphone might sound acceptable to the user who has that configuration. But typically, those devices aren't optimized for noise cancellation, and any type of ambient noise can have a downstream impact on others on the call. Leveraging devices optimized for these scenarios will help ensure a high-quality experience.

Each device needs to meet the needs of your users. You'll need to tailor devices such as headsets for the different personas and use cases in your organization. A persona-to-device mapping exercise should be completed as part of the planning process.

After you've selected the devices, include them in the pilot test plan for final validation. Leverage surveys during the pilot to collect feedback to ensure your device strategy is optimal.

> **NOTE**
> At this time, we recommend using audio devices that were certified through the Skype for Business Certification program. To find devices certified under this program, see the Microsoft Teams devices and USB audio and video devices.

Decision points	• Decide on your organization's overall device strategy for user and meeting room experiences.
Next steps	• Complete a persona-to-device mapping exercise for your organization. • Document the process for obtaining devices for users and meeting rooms. • Document the process for deploying and configuration devices for users and meeting rooms. • Procure initial devices to begin your deployment.

Adopt Microsoft Teams

11/2/2020 • 2 minutes to read • Edit Online

NOTE

For an overview of making the transition to remote learning and resources to help you get started, see our remote learning home page.

If you're a small business, or if you want to roll out Teams starting with chat, teams & channels, and meetings, use our prescriptive Get started guidance, which is designed to get you up and running quickly. If you're a large organization with a hybrid or on-premises Skype for Business configuration, or if you want to roll out voice features (such as Microsoft 365 or Office 365 calling plans or phone system), you can start with our Get started guidance, but you'll need the additional guidance below, under Deeper adoption guidance.

clock	Quick start		Introduction to teams and channels		Plan your first teams
	Empower your champions		Training		Tools and Downloads

Deeper adoption guidance

Adoption plans can be simple to complex, depending on your environment. For large-scale deployments, step through the guidance below to ensure your organization has a smooth transition to Teams.

	Start Get started Understand teams and channels Create your first teams Assess cultural and organizational readiness		**Experiment** Create your champions program Governance quick start Define usage scenarios Onboard early adopters and gather feedback Onboard support		**Scale** Define outcome and success Optimize feedback and reporting Drive awareness and implement training Schedule service health reviews

Get started driving adoption of Microsoft Teams

5/26/2020 • 2 minutes to read • Edit Online

By driving adoption of Microsoft Teams, you can deliver an excellent user experience and increased business value inside your company. Our goal is to get you up and running quickly so that you can begin your journey with Teams. This guide focuses on user adoption of Teams and has dependencies on your environment's technical readiness, which is addressed in other sections of our documentation.

Adoption prerequisites

Before getting started, make sure that:

- Teams is installed and licenses are assigned in your environment. At a minimum licenses should be assigned to your core team and to the early adopters who will participate in this initial project phase.
- You've downloaded the desktop and mobile applications.

Adoption framework

Microsoft 365 and Office 365 have an adoption framework that applies to major workloads in the service. This framework addresses the core steps that any organization should take to support cloud services. To learn more about the overall adoption framework, see Microsoft Enterprise documentation and resources.

In this Teams adoption plan, we've organized the steps in phases and provided specific Teams guidance as outlined in Adoption phases, next.

Adoption phases

Every adoption project varies in size and complexity based on your environment, but the initial steps are identical across the board. We believe that breaking the process down into three distinct phases—startup, experiment, and enable—will streamline adoption for everyone.

- **Start** - In this first phase, you'll gather your team together, set up your initial teams, and use Teams to begin planning Teams adoption. This approach will increase your technical familiarity with the product and help you to build the skills necessary to successfully complete subsequent phases.
- **Experiment** - In this phase of controlled growth, you'll bring your internal champions and early adopters onboard. You'll speak with your business users to identify scenarios that would immediately benefit from the collaboration and communications capabilities that Teams provides. You'll gather feedback that will inform your broad-scale adoption phase, and you'll make service decisions about governance and lifecycle management that will ensure a successful deployment.
- **Scale** - This is the broad-scale deployment phase in which you'll turn on Teams capabilities for all your employees. In this phase, the size of your organization will determine whether this is a "go big" project that will turn on Teams for all employees simultaneously or if you'll approach this by region, business unit, or other method of segmenting your employee population. In this phase you'll move to a continuous delivery model. Employees, leaders, and business units will want to expand their use of Teams and will require training and your engagement to understand how to best use Teams and other features of Microsoft 365 or Office 365.

Each of these adoption phases depends on your technical and environmental readiness for Teams. Let's get started!

Next: Microsoft Teams adoption phase 1: Start

Microsoft Teams adoption phase 1 - Start

5/29/2020 • 2 minutes to read • Edit Online

You'll start your Teams adoption with the following activities:

- Validate adoption prerequisites.
- Assemble your team.
- Understand teams and channels.
- Set up your first teams on Teams to build your technical knowledge.
- Assess your organization's readiness for change.

The primary goal of this phase is to ensure your readiness for the experimentation phase. You will also determine if you need assistance from Microsoft or from our network of skilled partners.

Validate adoption prerequisites

Review our adoption prerequisites and work with the technical team to meet them if necessary. We'll address deeper technical requirements within each adoption scenario.

Assemble your team

The table below lists the core roles for your project team. In a smaller organization, some of these roles may be carried out by the same person.

ROLE	RESPONSIBILITIES	DEPARTMENT
Executive Sponsor[1]	Communicate high-level vision. Connect Teams implementation to core mission and priority initiatives at the company.	Executive Leadership
Success Owner[1]	Ensure the business goals are realized from the Teams rollout.	Any department
Program Manager[1]	Oversee the entire Teams launch execution and rollout process.	IT
Champions[1]	Help evangelize Teams, support skill building, and provide usage insights.	Multiple departments
Training Lead	Manage and communicate training content about Teams.	IT or other
Department Leads (Stakeholders)[2]	Identify how specific departments will use Teams and encourage engagement.	Any department (management)
IT Specialists[1]	Oversee all technical aspects of implementation, including integrations.	IT
Communication Lead[2]	Oversee company-wide communications about Teams.	Corporate Communications, IT, or other

ROLE	RESPONSIBILITIES	DEPARTMENT
Community Manager	Manage day-to-day Yammer network activity. Provide guidance and best practices.	Multiple departments

[1]These roles are essential to the success of your project.
[2]These roles are important for the overall program success.

In most cases, this initial team should be a small group of like-minded people who are interested in Teams and may also be accountable for its implementation. As your adoption plan moves on to additional phases, you will include more people in your team. We also suggest that you take advantage of the Microsoft resources that are available to assist you.

Additional resources

The Microsoft Technical Community delivers peer-provided insights into adoption and technical issues for many Microsoft 365 and Office 365 products. We suggest that you join the following communities:

- Microsoft Teams Technical Community – Get product questions answered, learn from other Teams customers, and follow our blog to stay up to date on new features and use cases for Teams.
- Champions Program and the Driving Adoption community – Learn from your peers about how to best drive adoption of Microsoft 365 or Office 365 workloads such as Teams, SharePoint, Yammer, and other products. Open to IT Pros, business users, the "accidental" developer, and anyone interested in driving adoption of cloud services.

Next: Understand teams and channels

Understand teams and channels in Microsoft Teams

6/8/2020 • 2 minutes to read • Edit Online

The concepts of teams and channels are fundamental to a healthy, productive implementation of Microsoft Teams.

- A team is a collection of people, content, and tools that work together to produce a business outcome for your company. Teams are built on Microsoft 365 Groups, and changes to Microsoft 365 group membership sync to the team.
- Channels are the collaboration spaces within a team in which the actual work is done.

To read more about teams and channels, see the Overview of teams and channels in Microsoft Teams. For comprehensive Teams adoption guidance, get the Teams Adoption Guide. To learn more about Teams and Microsoft 365 Groups, see Microsoft 365 Groups and Microsoft Teams and Learn more about Microsoft 365 Groups.

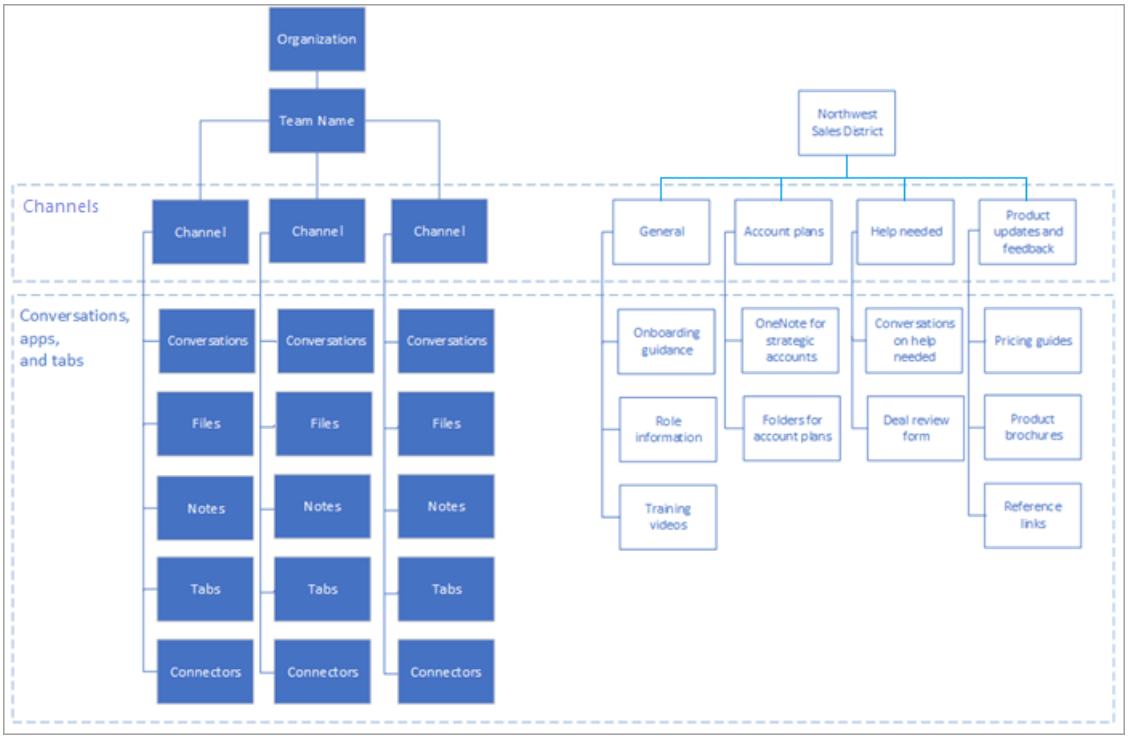
View this short video	https://www.youtube.com/embed/hjJWtoaRJeE

Team access types determine who can join a team:

- *Private* teams are restricted to team members approved by the team owner(s). This is a typical setting for project teams and virtual teams in a large organization.
- *Public* teams are open to anyone in the organization, and users can join them directly. Public teams are useful for collaboration on topics of general interest to people in different departments or to people who are working on different projects. This is a good default setting for smaller organizations.

Use Teams to drive cross-organization collaboration

It's a best practice to use teams to improve cross-organization collaboration, and many projects will lend themselves to this model. In addition, leaders or divisions inside of an organization might want a dedicated team for their own people. Consider the organizational and project models shown in the following illustration.



In an organizational team (shown on the left), key information about the way that organization runs its business, team events, core strategies, and other operational information, such as business reviews, might be shared. For the team shown on the right, the district's information is broken down into channels that represent the categories of work that are being accomplished by that team. Members of this team may or may not report to the same person, but they are all engaged in driving the results for the district.

You will work more on the structure of your teams in phase 2 of your implementation.

Next: Create your first teams

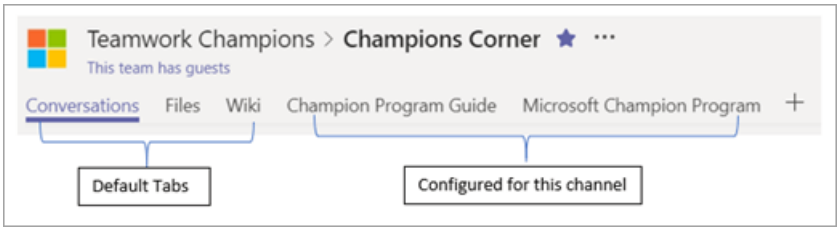
Create your first teams in Microsoft Teams

5/26/2020 • 2 minutes to read • Edit Online

The best way to drive adoption of Teams is to use the product. We recommend that you manage your Microsoft 365 or Office 365 deployment with Teams. You should also create a community of employees who are focused on teamwork and productivity. (These initial teams may change over time.) Some suggested teams are:

TEAM NAME	PROPOSED CHANNEL NAMES
Get to know Teams	General Say hi How do I? Feedback Ideas for future teams Support
Microsoft Teams Implementation	General Awareness and Adoption Business Engagement Early Adopter Program Feedback and Insights Security and Compliance Strategy and Planning Service Health and Incidents Training Watercooler Chat
Teamwork Champions	General Best Practices, Training, and How To Champion Corner Feedback and Support Program Leads Social Hub

Within Microsoft Teams, the tab gallery gives you access to all Microsoft 365 or Office 365 and third-party apps that have been turned on by the administrator. To get the most value from your product, we suggest pinning key resources as tabs in each of the appropriate channels. See the example below.



In your initial teams, we suggest pinning the following items for easy reference in your team channels. These assets are in addition to your OneNote notebook sections. If you're working with our FastTrack team, they will assist you in configuring these first teams.

TEAM/CHANNEL NAME	PINNED TAB
Microsoft Teams Deployment	

TEAM/CHANNEL NAME	PINNED TAB
General	Web tab: Teams documentation
Awareness and adoption	Teams Adoption Hub Microsoft Teams Customer Success Kit
Business engagement	Wiki – Engagement guidance Form – Request for Teams consultation List – Engagement requests
Early adopters	Pinned feedback community OneNote for FAQ and common themes
Feedback and reporting	Pinned Microsoft 365 or Office 365 usage report (for Microsoft 365 or Office 365 admins only)
Security and compliance	Microsoft Trust Portal Security and compliance documentation Roadmap
Strategy and planning	Collaboration North Star PowerPoint Service Adoption Project Plan
Training	Custom learning training portal Teams online training
Teamwork Champions	
General	Use for program announcements Pin champion program overview
Best practices	Best practices for teams, channels, and chats PowerPoint Team lifecycle
Champion Corner	Meeting notes and presentations
Social Hub	RSS connector: Teams blog and driving adoption blog
Training and How To	Your training portal link

Making the switch to Microsoft Teams

As you begin to use Teams, it will be important for you and the rest of the project team to commit to using Teams chat, channels, and resources to run your project. Your own usage of Teams is critical to the quality of your adoption project. We recommend that you resist fragmenting your project by continuing to have conversations with the core project team in email. By switching to Teams you will model the behavior you ultimately want your employees to embrace. Set the tone, go first, and begin to enjoy having your project information in one place!

Next: How ready is your organization for Microsoft Teams?

How ready is your organization for Microsoft Teams?

5/26/2020 • 4 minutes to read • Edit Online

Now that your project team has come together and you are beginning to see what Teams can do for your organization, it's important to assess your organization's readiness for the Teams transition. To assess your readiness, you will need to:

1. Assess your stakeholders.
2. Identify early adopters.
3. Evaluate the organization's readiness for change.

Assess your stakeholders

List the core stakeholders and business leaders in your organization. For each individual, ask the following questions:

1. Is this leader friendly to new technology?
2. Rate this leader's satisfaction with your current technology.
3. Is this leader willing to use unsanctioned technology to accelerate results or create a better experience for his/her team members?
4. Is this leader under a high degree of pressure to deliver key business results?
5. Will this leader be willing to evangelize his/her experience with Teams to assist in the transition?
6. Does this leader have a positive relationship with key members of the existing project team?
7. Does this leader like to be viewed as an "agent of change" within the organization?

You can add additional questions that are relevant to your organization. For your initial two phases (startup and experiment), you'll see leaders who are friendly to change, somewhat dissatisfied with current technology, and that you have a good relationship with. These leaders should be brought into the core project team as business advisors and may have projects that will be essential for your experimentation phase. It is important to select impactful, real world situations to experiment with, and avoid high risk projects for your initial experiments.

> **NOTE**
> While it's possible to assign a score to this sort of questionnaire that would minimize the impact of the human element of relationships within your organization, driving change depends on the chemistry of the team as much as their technical skill or business acumen. Review this list with your team members to discuss the "fit" of your various leaders with this project as you select projects and staff for subsequent phases.

Identify early adopters

Early adopters share certain traits no matter what size or industry your organization may be. Typically, early adopters share these traits:

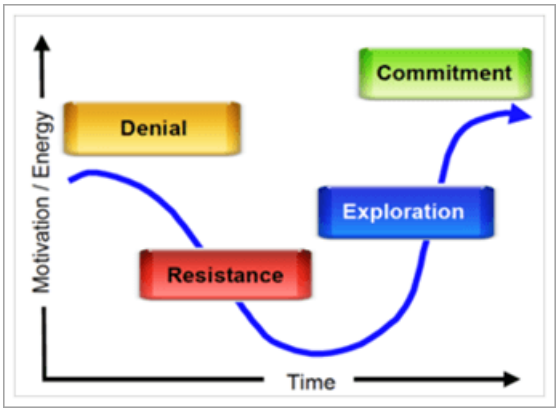
- Interested in technology
- Willing to be a part of change
- Seeking to make improvements
- Collaborative by nature
- Willing to share their observations and learnings with the group
- Are risk takers; that is, they're willing to try something to see if it works

Use a simple form in Microsoft 365 or Office 365 to allow these individuals to opt into your early adopter program for Teams. Depending on the size and complexity of your organization, you may choose to enable some or all of these individuals for your experimentation phase. In this program, they are agreeing to actively participate in your experimentation phase and provide regular feedback to the project team. Avoid having individuals who simply want to test drive new technology. Let them know that by giving this active feedback, they are helping to craft the outcome of your project. You will use this list of people in Phase 2 - experiment.

Our Early Adopter Program Guide is a helpful resource for kicking off this program in your environment.

Assess your organization's readiness for change

Change is a human process that has nothing to do with technology. There is behavioral psychology and neuroscience that educates us about the natural resistance to change. To make change acceptable, it's critical to anticipate the needs of your users, express your understanding of their situation, and create solutions that improve that situation. Even in doing so you will encounter natural resistance to change.



Every organization approaches change differently, depending on region, work style, professional profile, and other elements of the organization. To assess your organization's readiness, see Assess organizational change readiness. Use the guidelines to answer the following questions:

1. What percentage of users fall into each bucket? (*Change resistance*)

   - **Early adopters**: request the solution before it's available.
   - **Informed users**: use the solution once its value is proven.
   - **Dissenters**: push back on any change.

   > **TIP**
   > Early adopters make great pilot testers and peer champions. Users who are slow to adopt new tools require additional encouragement and more time to adjust.

2. What is the users' competency for change? (*Training*)

   - **Self starters** require only a link to a video.
   - **Team builders** do well with group training.
   - **One-to-one learners** require personal support.

   > **TIP**
   > Tailor the type and amount of training to competency and personas. Keep training updated as new features come online.

3. In addition to this service deployment, how many other changes are happening? (*Adaptability*)

Changes could include Office/Windows upgrades, office moves, mergers, reorgs, and so on.

- None
- 1-3 changes
- More than 3 changes

> **TIP**
> Too much change can impede acceptance and productivity. If more than 3 changes are underway, consider spacing them out or creating a theme to bundle changes together.

Combine this data with the stakeholder profiles and employees who wish to opt in for the early adopter program. This will let you identify groups that are ready for and can absorb change alongside their existing duties. This method will allow you to create partners in change.

You can use internal champions to address the problem of having different change types. Here, feedback is the key to success: encourage people to share their challenges and needs. Embrace disrupters and dissenters by giving these individuals or groups a seat at the table during experimentation. This best practice will pave the way for a smoother broad deployment of your collaboration improvements.

Next: Microsoft Teams adoption phase 2: Experiment

Microsoft Teams adoption phase 2 - Experiment

4/27/2020 • 2 minutes to read • Edit Online

You are now armed with a great project team and critical information about your organization, and you are ready to experiment with Teams. We recommend experimenting with 2 to 3 real world projects within a group that is led by a stakeholder with whom you have a positive relationship and in whose organization there are a sufficient number of early adopters to provide meaningful feedback. Whether your organization is large or small, we recommend completing this phase to gain insight into how Teams can improve your collaboration beyond using its chat and file storage features.

You will complete the following steps in this phase:

1. Create your champions program.
2. Complete your governance quick start.
3. Define your use cases.
4. Finalize early adopter program participants.
5. Set up your feedback channels.
6. Bring your support staff on board.

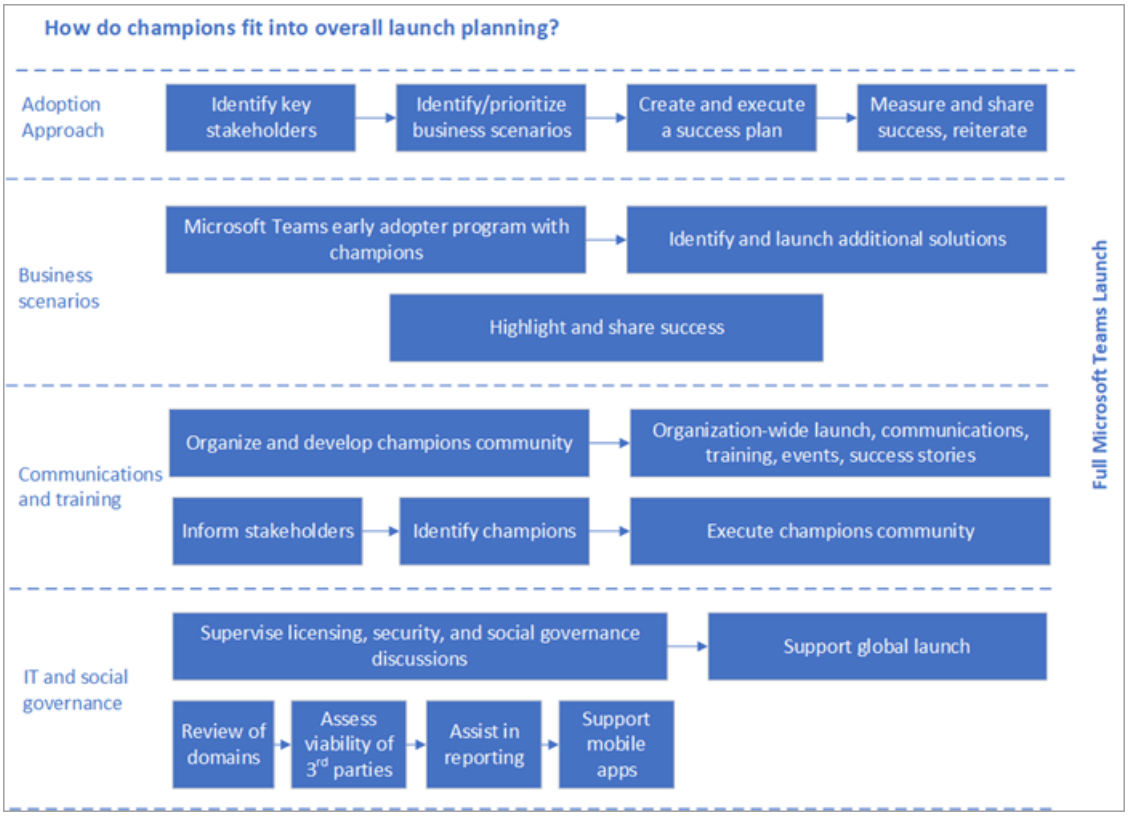
Next: Create your champions program

Create your champions program for Microsoft Teams

6/9/2020 • 2 minutes to read • Edit Online

Champions are essential to driving awareness, adoption, and education in your organization. A champion is a person, primarily motivated by helping others, who is interested in new technology (specifically Teams) and helping other employees use it in alignment with your best practices. Depending on the size of your organization you may have this as a formal part of the person's role, but often employees take on this role themselves because of their core motivation to help others.

Champions will fit into your overall launch planning in a variety of ways as shown below.



Champions should:

- Be formally trained to increase their depth and breadth of knowledge
- Be encouraged and empowered to guide, teach, and train their peers
- Have consistent and positive reinforcement that affirms the impact of their efforts
- Have a clear plan to execute

Use our Champions Program Guide to build this program in your organization. Our best practices for this community are:

- Join the Champions Program. Make sure that at a minimum the leaders of the Champions program (and potentially all company champions) are members of the program. This free, monthly community call will provide valuable information for running your own program and getting the most from Teams and other Microsoft 365 or Office 365 services. Program materials can be reused in your own internal program.
- Use the Teamwork Champion team: Your champions should use the team you have setup for them for all program communications, feedback, and to find resources. In doing this they will become increasingly familiar with the product and its benefits.

- Hold regular monthly meetings: Promote enthusiasm and cohesiveness of your community by holding regular monthly meetings. These can be a combination of in person and virtual meetings, but their consistency is key to having a thriving champions community.

  > **TIP**
  > To help build your agendas, schedule your meetings for the week after the public community call.

- Be clear about program requirements: Some champion programs require that members attend the monthly meetings, hold office hours for the group of users they support, and provide training to new users. Whatever your requirements, make sure that champions are clear on how to successfully participate in the program.
- Visibly reward your champions: Your champions will give you important insights into the progress and potential pitfalls of your project. Reward them often for their participation. Small gestures go a long way, and often employees are not looking for monetary gain but appreciate recognition for their contributions. Find appropriate and fun ways to thank your community.
- Train champions early and often: Your program kick off and monthly meetings can be used to build skills in your champion community. Use these opportunities to bring them on board, conduct their initial training, encourage them to attend our courses, and make sure they are ready to support their employees as they move forward in the experimentation phase.

Next: Complete the governance quick start

Governance quick start for Microsoft Teams

10/12/2020 • 4 minutes to read • Edit Online

The following activities will happen simultaneously, and they may involve all or part of your key team. As a best practice, defer large-scale governance and security conversations for after you have completed your initial experimentation with Teams. It is important to understand how governance decisions may impact the end-user experience and will simplify the decisions you will need to make at that later date. For this phase there are some decisions that need to be made. To successfully make them you will first need to answer the following questions:

- Which stakeholder from your earlier assessment is a good candidate to participate in this limited business onboarding?
- Has this individual (or group of individuals) suggested use cases that would be good candidates for this phase?
- Do they have enough interest from employees in their organization to be early adopters and give you meaningful and regular feedback?

To learn more, read Plan for governance in Teams and Plan for lifecycle management in Teams.

Decisions

Make the following decisions (at this point, these decisions apply only to Phase 2):

Decision 1: Who can create teams

For the purposes of this phase you can restrict who is able to create teams to the early adopter population in addition to your core project team. This will allow your early adopters to create additional teams if needed. Monitoring this behavior will give you key information for your broad deployment.

Decision 2: Teams naming conventions

You will likely want to implement some naming conventions for your broad deployment of Teams, and check for duplicate names. In Phase 2 we suggest that you implement a manual naming convention for your initial projects only. The best practice for this is to conduct an interactive onboarding with the early adopter project team and allow them to select their own name. This will give you insight into how employees think about their work and will be essential in creating a larger scale naming convention at a later time. (Additional information on the elements of an interactive onboarding will appear later in this guide.)

Decision 3: Guest access

Depending on the scope and type of your project and the nature of your industry, enabling secure collaboration with partners or vendors may be an essential capability you want to test. You can limit who can add guests to teams by using the appropriate tenant controls, and limit which teams are open to guests by using sensitivity labels. You can additionally ensure that guests adhere to organizational security requirements such as the use of Multi-Factor Authentication (MFA).

Decision 4: Approved apps

The best case use of Teams includes the integration of other apps into the experience. At a minimum your technical team should enable the first party and featured apps in your Teams experience. Depending on your use case and other apps used in your organization, you may opt to include additional apps as a part of your controlled experiment. Be sure to vet any third party apps to ensure they adhere to your organization's security and compliance requirements.

Decision 5: Are meetings included in your test?

The Teams meeting experience is high quality, supports video chatting, and brings your employees together to be

more effective. Consult with your technical team to make sure that your environment is ready to include simple VoIP meetings. Enabling audio conferencing or voice services would normally be excluded from this phase of your experimentation; however, that depends on your core project team, your technical readiness, and the state of other voice/meeting services in your organization. Technical readiness should include things such as meeting room equipment, end-user devices and accessories, and the network. We recommend including video chats and VoIP meetings in your experimentation to gain more value from your Teams implementation.

Decision 6: Content management and structure

Teams works best when users work end-to-end within the platform - instead of requiring them to continually switch back to legacy systems and services - and offers new ways of working that differ from how users are accustomed. As part of your experiment, work with your participants to consider team structures and channels that embrace the multi-modal ways of collaborating within Teams, and avoid simply replicating existing folder and storage structures. Additionally, consider any compliance requirements for content stored outside of existing supported systems such as records management or backup systems.

Decision 7: Data security

In preparation for your broad deployment you may opt to use security labels to classify the types of teams in your environment. For the purposes of this experiment we recommend that you refer to Plan for Governance in Teams and ensure that a basic retention policy has been set on Teams data in your Microsoft 365. You may need to coordinate this work with your technical team because Microsoft 365 administrator rights are required to complete this work.

Decision 8: Length of your experiment

A successful Teams implementation proceeds at a healthy pace to ensure appropriate momentum, focus, and learnings. We recommend that this phase of your project be 60 days in length to ensure that your early adopters complete sufficient business cycles. Extending experimentation for too lengthy a time increases the risk of a failed change program; however, this time will vary for every organization.

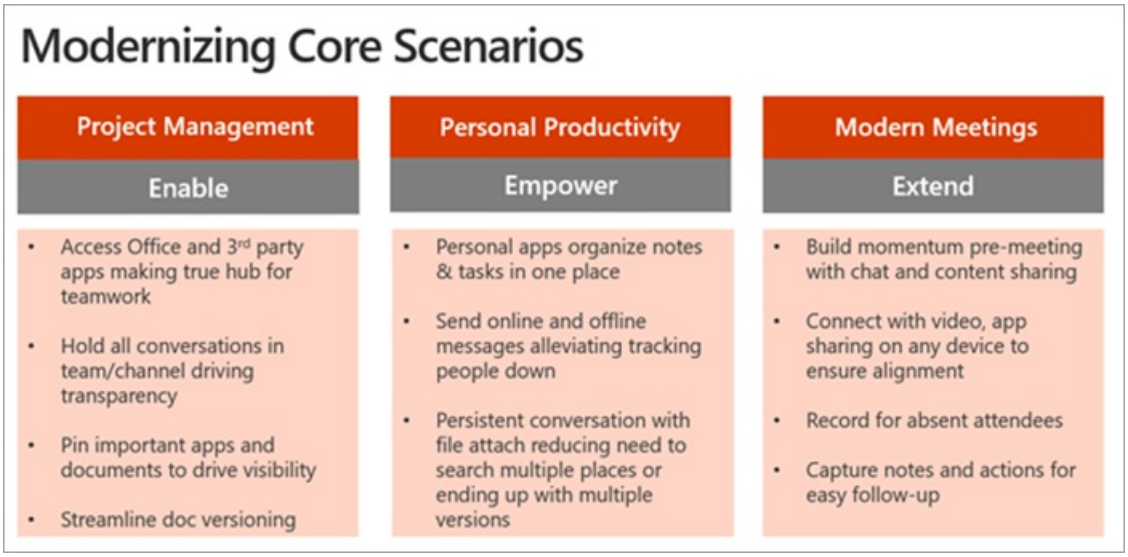
Next: Define usage scenarios

Define usage scenarios for Microsoft Teams

5/1/2020 • 2 minutes to read • Edit Online

Make sure that you understand the business projects (scenarios) that will be in scope for this phase of your implementation. Take a look at this list of example scenarios that are great candidates for an early adopter program. You can get started with easy wins such as:

- Personal productivity
- Modern project management
- Modern meetings



Additional scenarios to consider are:

- Employee engagement and communication
- Bring campaigns to market faster
- Increase sales productivity and grow revenue
- Streamline business reviews



Think of this scenario modernization motion as a cumulative process – get things going with more basic scenarios

to create enthusiasm, familiarity, and credibility with this new way of working. Then move on to more ambitious areas of impact. As more impact with Microsoft Teams is demonstrated to your business colleagues, more of them will get engaged and momentum will build. For many of our customers, once they get this process going they find that business stakeholders approach them after learning how their colleagues got value from Microsoft Teams.

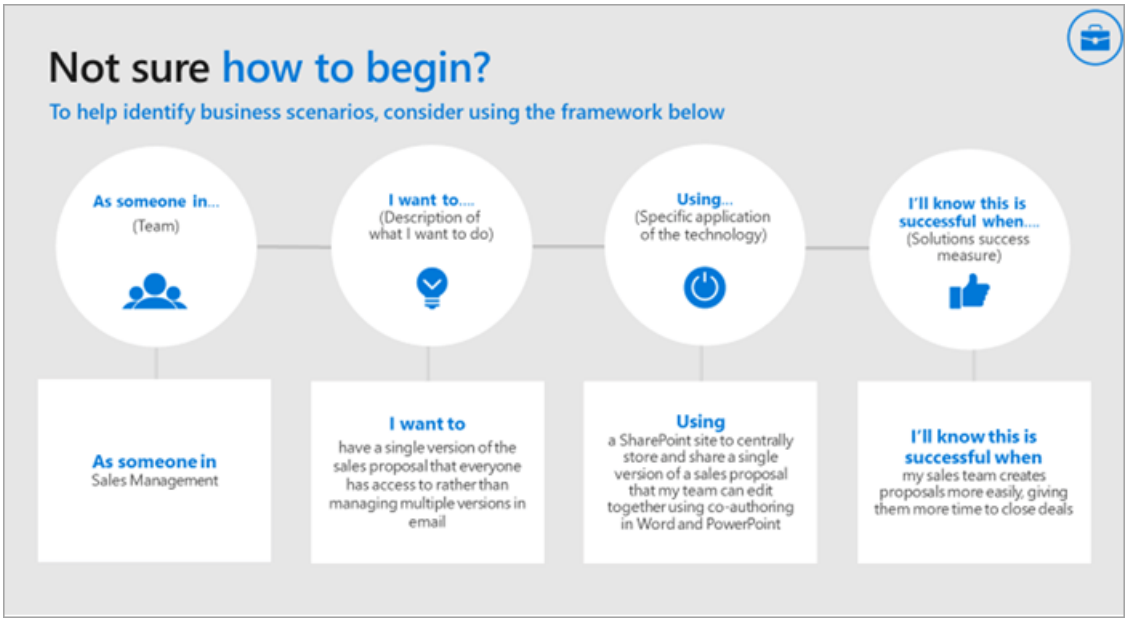
Interview business stakeholders

To confirm the selection of these early projects we recommend meeting directly with the stakeholders you identified earlier in this process. Your goal at this point is to listen and learn additional information about their business. Consider the following questions to drive the conversation:

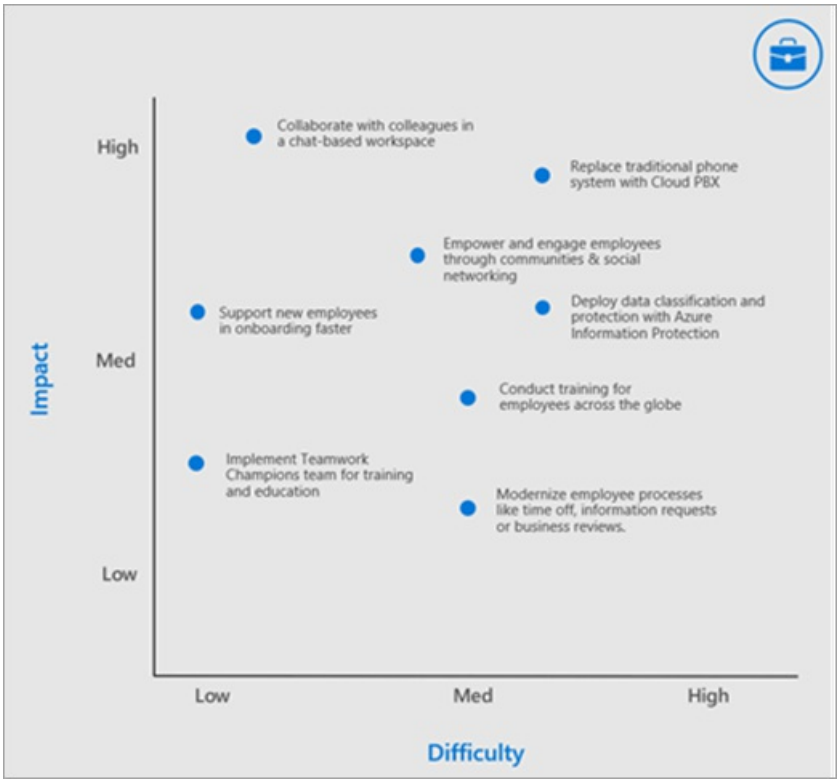
- What are some of the organization's challenges or pain points related to communication and collaboration?
- What are the areas in which your organization would like to improve?
- What are the organization's strategic initiatives or current transformation projects that Teams can support?
- What methods of communication and collaboration are typically better received by your organization than others?
- What is the process for drafting, distributing, and sharing information?

Map and prioritize business scenarios

To be sure that you have the right information about the business scenario, consider using the following format to document the scenario from the perspective of the employee completing the work and the business owner of the process. Both perspectives are required to craft a successful path forward.



After speaking to one or more business stakeholders you can prioritize your scenarios based on impact vs. difficulty. (Your scenarios may be in addition to the scenarios we suggest above.) Appropriate candidates for your experimentation phase should have higher impact and low to medium difficulty. This will ensure your project isn't affected by scope creep or technical difficulties before you are able to show the value of your work. An example chart is shown below.



NOTE

We are always eager to learn about how our customers use Teams in new an innovative ways. Share your #TeamsStories with us in our Driving Adoption discussion forum. Include the hashtag **#TeamsStories** in your post. We are always interested in how you use Teams in your organization.

Next: Onboard early adopters and gather feedback.

Onboard early adopters and gather feedback for Microsoft Teams

5/26/2020 • 2 minutes to read • Edit Online

Return to the list of employees who expressed interest in your early adopter program. Decide which of these individuals should participate in your initial experiments with Teams. It may be all or a portion of the people who are interested. Even if you do not select them for these initial projects, continue communicating with them so they remain interested and will be willing to participate in the future. They will be a part of the onboarding process for the projects you selected based on your discussions with business stakeholders, your technical team, and your prioritization exercise shown above.

Complete the following steps with these early adopters:

1. Send an invitation email to them to invite them into the community,
2. Host a kick-off call to share with them the goals and outcomes of the early adopter program,
3. Ensure access to the feedback channel of your teamwork champions team and any other internal social networking tools you may use.
4. Consider creating periodic surveys for them to complete that will gather targeted information.

Gather feedback

Use the components of Microsoft 365 or Office 365 to gather feedback for your project.

Decision: If your organization already has an investment in a Yammer network, you can use it as a feedback forum for your early adopter program. If not, and your early adopter program has less than 5000 members, create a team in Teams to gather feedback and provide training.

> **NOTE**
>
> Some organizations will combine the channels for early adopter feedback into the teamwork champions program team. This is a good approach because many early adopters may become champions in the future, and it will build a stronger community.

Next: Onboard support.

Onboard support for Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

To ensure that the early adopter and champions teams will have the appropriate support as they start using Teams, meet with your support staff and review the capabilities of Teams. Key members of the support organization may want to join your early adopter program. Encourage their use of Teams in their own scenarios. Take them through the basic onboarding of the product by using our online training resources.

- Foundations - Core Components of Microsoft Teams
- Troubleshooting Teams
- Known issues and troubleshooting
- Microsoft Teams training


Next: Microsoft Teams adoption phase 3: Scale.

Microsoft Teams adoption phase 3 - Scale

4/27/2020 • 2 minutes to read • Edit Online

In this phase, you will use your learnings, talented project team, and relationships with stakeholders, champions, and early adopters to support the broad scale enablement of Teams for your organization. You will complete the following steps as you prepare for continued business engagement regarding your organizations use of Microsoft Teams:

1. Define outcomes and success measures.
2. Select service strategy.
3. Engage stakeholders.
4. Design and launch an awareness campaign.
5. Design and launch a training program.
6. Understand reporting tools.
7. Prepare for ongoing business engagement.
8. Prepare for ongoing service health & adoption reviews.

Next: Define outcomes and success

Define outcomes and success for your Microsoft Teams adoption

5/26/2020 • 8 minutes to read • Edit Online

For every business scenario or service you modernize, it is critical to define what success looks like for your business. You will have gathered that information for your initial scenarios as you mapped them in your prior phase. As you prepare for your scale implementation, you will need to revisit and expand these important success criteria.

What follows is a recommended strategy for mapping these criteria. There are many valid approaches to this step. You can follow our guide or follow the guide of the Microsoft partner you may be working with. Whatever method you choose, make sure that your business outcomes are supported by the technical implementation of your services and overall objectives of your organization.

There are four categories of outcomes that can be prioritized for your business. They are interconnected and form the foundation of the modernization and digital transformation that individual employees will experience.



Example of outcomes in each category are:

- **Organizational**
  - Cultural transformation
  - Employee retention
  - Talent acquisition
  - Social engagement
  - Operational agility
- **Cultural**
  - Employee sentiment
  - Employee recommendations
  - Customer feedback
  - Innovation measures (for example, idea forum contributions, hackathons, product innovation engagements)
- **Tangible**
  - Customer experience impacts (faster service, reduction in service incidents, customer referral/loyalty program participation)
  - Cost savings
  - Revenue generation
  - Data security
  - Process simplification

- Retirement of legacy systems
- **Individual**
  - Use of desired tools
  - Employee morale
  - Employee productivity
  - Employee engagement
  - Idea generation

In general, you should think of these measures aggregating to create a change quotient for your company in this manner:



Select a service enablement strategy

Teams is a transformative technology, so depending on the size of your organization and your existing technologies, you may take different approaches. Consider these strategies:

TEAMS FIRST	TEAMS CORE	TEAMS GO BIG	SKYPE SIDE BY SIDE	MIGRATION
Lead cloud deployment with Teams	Lead collaboration scenario enablement with Teams	All employees on Teams and organization-wide teams	Enable Teams and Skype for Business	Migrate users from Skype for Business to Teams
- Applicable to new or low usage Microsoft 365 or Office 365 customers - Lead with Teams in customer-specific scenario - Highlight integrated user experience and accelerated time to value for Microsoft 365 or Office 365 - Conduct planning workload enablement together to avoid serial implementation	- Enable Teams along with OneDrive and SharePoint Online - Create a company intranet to share news resources and video with Microsoft Stream **Better together**: Teams SharePoint Yammer Planner PowerApps	- For customers with less than 5000 seats (current limitation) - Enable cross organization collaboration with one team for all - Automate common tasks (vacation requests, employee surveys, executive engagement)	- Use Teams Core tactics to accelerate collaboration - Highlight meeting scenario guidance based on size and feature set required - Use Skype for Business for enterprise calling, interoperability, and hybrid scenarios - Use public roadmap for capability planning.	- Plan move to Teams from Skype for Business by creating service strategy roadmap for the customer - Attach to feature release schedule - Recommend including Side by Side and Teams Core to ease transition

The following are our recommendations for most customer organizations. However, there are exceptions. To get guidance for any scenario not covered here, ask your questions in our Driving Adoption community or reach out to the FastTrack team or Microsoft partner network.

- **Choose Teams First or Teams Core**: Most organizations have an existing investment in Microsoft technology. You may be enabling more than one workload at a time, such as Exchange Online, OneDrive for Business, or SharePoint. In these cases, selecting Teams First or Teams Core is a wise choice. It will enable your users to get used to the enhanced collaboration experience of Teams. Your collaboration project team can then plan to roll out additional capabilities and the training and support required for them to be successful.
- **Choose Teams Go Big**: In new Microsoft 365 or Office 365 customer organizations it is often best to take a Teams Go Big approach to minimize the change fatigue caused by learning new technology multiple times.

You'll get the greatest benefit by enabling Teams for both core collaboration and meetings, SharePoint, OneDrive, Planner, and other workloads, and allowing your employees to learn about them in the context of your Teams deployment.

Teams Go Big is also the preferred enablement strategy for organizations under 1,000 employees who want to simplify their employee communication and engagement. Using the organization-wide team can bring people together to review common tasks and initiatives on any device.

- **Choose Side by Side**: For organizations that are using Skype for Business for audio conferencing, support for conference room devices, or cloud voice capabilities, we recommend running Teams and Skype side by side to familiarize your employees with the core collaboration features, while planning your migration off of Skype for Business at a time that is convenient for your company. Note that running both clients side by side can introduce user confusion about which tool to use, so we recommend keeping this phase in your adoption journey short.
- **Choose Migration**: Migrating from Skype for Business to Teams has additional components from a technical perspective, but the user adoption journey has the same components as a Teams Go Big implementation. In addition, you will be educating people about the Teams meeting experience and interface, the new persistent chat behavior, and other elements of the experience that are different from Skype for Business.

For each enablement strategy, it's essential to work closely with your technical readiness team to ensure that your environment will deliver a great employee experience.

Decision: Select an enablement strategy that will best support your business outcomes for Microsoft Teams and that can be enabled by your technical implementation team. This is a joint decision between IT leadership, program management leads, and user adoption specialists. This decision often rests with the executive stakeholder who is the ultimate success owner for Microsoft Teams or collaboration services in your organization.

Best Practice: Enablement strategies can be appropriate for a given phase of your project or divisional implementation schedule. Use key personas and their needs to make selections. Work closely with your technical implementation team to ensure a high-quality experience for your users.

Engage stakeholders

Communication and managing expectations are key elements in a successful change project. It's important to regularly communicate your overall vision and your progress toward that goal to your stakeholders and others in your organization.

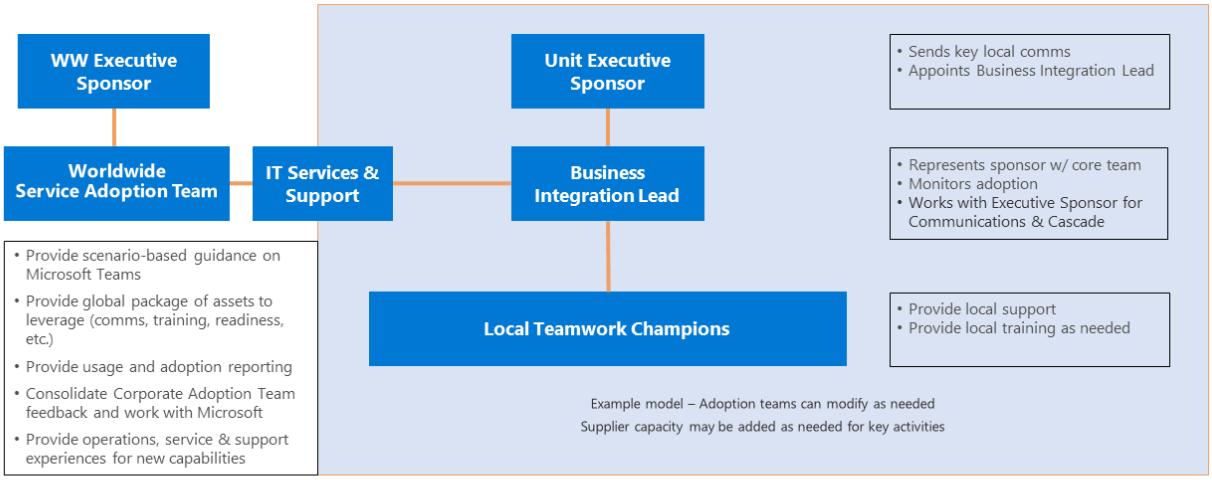
Decision: Decide your rhythm and method for communicating with your stakeholders in alignment with your company culture. Target your communications to the various levels of engagement and interest across your organization.

Option: To create an ongoing knowledge base of information about your project, consider using news pages in your SharePoint communication site. Your news page library (site pages in the SharePoint site associated with your planning team) can be made public so they can be shared with all interested parties.

Expand your implementation team

In a large organization you should try to incorporate many different roles in your broad enablement phase. This may include additional business sponsors, IT support staff, additional members in your champion community, and in some cases formal change management or training personnel. The illustration below shows a large scale adoption team that allows for a separation of duties.

Large Scale Corporate Adoption Team Model



EXAMPLE

In a smaller organization one or more of these roles might be performed by a single individual, but the skills required remain the same. Technical, communication and training skills are important in a successful change project.

Expand your governance and information management policies

Once you've selected your enablement strategy you'll be ready to revisit and scale governance decisions you made in Phase 1. Revisit decisions 1 through 6 from the Governance quick start to expand these policies in alignment with the business users who will be using Teams.

TEAM LEVEL	SCOPE/PURPOSE	STANDARD MEMBERSHIP	DURATION
Level 1	The authoritative team for a division or business unit	Usually restricted to official members of this division/unit	In perpetuity for as long as the division exists (for example, IT department, Human Resources, Marketing)
Level 2	Project, service, or initiative teams with a smaller scope	Normally cross-organizational and may include guests	For as long as that project or service is being worked on
Level 3	Point in time projects	Small tight knit team with individual scope; may include guests	Short lifecycle tied to core deliverable

Example team level provisioning and management best practices:

TEAM LEVEL	WHO CREATES?	LAVELS AND RETENTION	CONSIDERATIONS

TEAM LEVEL	WHO CREATES?	LAVELS AND RETENTION	CONSIDERATIONS
Level 1 - Divisional	IT or champion for that group to name it properly	Confidential with standard retention policy applied and 1 year renewal policy	Think of this like reserving a domain name. You want control of how division teams are named and what's included. Design the team before adding additional users.
Level 2 - Project/service	Project owner or champion	Confidential or highly confidential depending on content. May have a retention policy. 6 month renewal.	Before creating this, think just beyond the boundary of the project or service you are working on. Would it make more sense to combine forces with another team? Make every effort to minimize the number of teams individual users have to visit when working on the same project or service.
Level 3 – Small on-demand project team	Anyone in the organization	General label with standard retention and 6 month renewal. May include naming convention (prefix/suffix)	Self-service on demand teams. Frictionless provisioning. These facilitate smooth collaboration and communications for small project teams looking to get immediate value from company provided services.

Streamline business engagement

An essential part of driving digital transformation and usage in Microsoft Teams is working with your business units to understand what needs, opportunities, and difficulties they have. While similar to the traditional IT to business conversation, your focus should be on what is needed. Listen before moving to technical requirements. In many cases, out of the box features in Teams will meet the needs of your organization.

Best practice: Before you consider developing a custom solution, be sure that your organization is fully using the out-of-the-box capabilities of Microsoft 365 or Office 365. Custom solution development always incurs long term cost for your IT and support departments.

Take the following steps to streamline your work with business units. Recognize that in very large, multi-national corporations this process may continue long after your first large scale deployment of Microsoft Teams:

1. Meet with key influencers within a business unit before engaging the executive to gain insight and alignment.
2. Understand their current solutions for common scenarios (email, SharePoint, Yammer, and other products).
3. Start small by selecting scenarios that map to high impact, low/medium difficulty as you scale,
4. Capture feedback and develop champions with business unit knowledge to support the transition,
5. Set up monthly check points to discuss progress and prioritize the backlog of additional projects.

Next: Optimize feedback and reporting

Optimize feedback and reporting for your Microsoft Teams adoption

6/24/2020 • 2 minutes to read • Edit Online

Ensure that you are getting signals back from your service and your employees by following our best practices for user feedback and service health reporting. In some cases, you may need administrator rights to access certain service usage and health reports. If you are not the Microsoft 365 or Office 365 administrator for your organization, work with that individual to be granted the report reader role in the Microsoft 365 admin center to access some of this data.

Incorporating feedback

Throughout your experiment phase you will be capturing information about how people have used the product and their experience. Use this information now to adjust your awareness and training programs as you plan to expand its use across your business units. Some common example questions might be:

- When do I use this new tool alongside my existing technology?
- Who is approved to use this tool with me?
- Is it safe for highly confidential information?
- Who do I speak with to learn more about Microsoft Teams?
- Something's not working. How do I get help?

Invest in your champions

As you prepare to scale your usage of Microsoft Teams, recruit additional champions in each business unit or group you are expanding to. Enroll these enthusiastic people in your service training program, and standardize how and when you meet with them.

Be clear in your champions program design what your employees will get and what they are expected to give if they become champions. Common program requirements are scheduled office hours, participation in monthly community calls, and participation in internal online communities to support your transition to these new experiences.

Best Practice: Hold a monthly Teams meeting for your internal champions. Split your agenda between teaching new features, addressing feedback, and providing self service tools for your employee community.

Best Practice: Have representatives from your internal support department or IT Helpdesk join your champions community to stay up to date on new information about your Teams usage.

Service reporting

There are three types of reporting you should review as you deploy and adopt Microsoft Teams:

- Service health – from Microsoft 365, Office 365, and your internal IT support department.
- Microsoft 365 Reports in the admin center – from Microsoft 365 or Office 365 view Microsoft 365 Reports in the admin center - Microsoft Teams user activity. You may also use information from other systems within your organization.
- Service satisfaction – Gathered from internal community forums and surveys on specific experiences

Next: Drive awareness and implement training

Drive awareness and implement training for Microsoft Teams

7/31/2020 • 2 minutes to read • Edit Online

Awareness and training are the marketing and communications segment of your overall adoption strategy. This will ensure that your employees are aware of the new capabilities of Microsoft Teams and its underlying Microsoft 365 or Office 365 services and apps.

For both your initial pilots and your eventual company-wide roll out, your internal communications should be a priority. They should include:

- Internal awareness materials such as posters, digital signage and events.
- Self-help and training information in a single location.

For your pilot phases these are the minimum steps for success:

- Have a regular scheduled meeting with your project stakeholders for updates.
- Make self-help documentation available, including product videos.
- Hold a kick-off meeting with the pilot users to get them excited about their participation. The importance of creating a sense of community with enthusiasm can't be overstated.

Once you have worked through the initial pilot, you can expand the efforts above to reach your entire organization. Depending on your size, this may take time and be approached in phases by region, user profile, or organization. During this larger scale roll out, encourage the involvement of the communicators in your organization. We recommend these individuals be involved early and often as you use the available adoption materials or design your own.

If your company has a central intranet portal for news, information, or support, you can use it as a hub for information about this roll out. Providing widely available self-help information, training, and written guidance lets users quickly come onboard. Many users will simply jump in once Teams becomes available and we encourage this. We also know that each individual learns in different ways; a central information portal can support all styles of learning within your organization.

Implement end-user training

Use our resources to deliver end-user training as people begin to use Microsoft Teams and other Microsoft 365 or Office 365 services. Visit our resource pages to learn more:

- Instructor-led end-user training for Teams
- Administrator training for Teams
- Online End-user video training
- Coffee in the Cloud online training for champions & IT pros
- Adoption Tools

Measure and share success

As with any communications and adoption campaign, you will want to identify your success measurements up front. Consider these:

- Active users in the product

- Views of your information webpages
- Questions in your user community
- Views of your training videos
- Attendance at learning events

Share the insights you get from your feedback channels with the hashtag #TeamsStories for easy retrieval. Share a #TeamsStory per month on your intranet to highlight employees who are embracing the change to increase productivity and collaboration in your environment. Also share them with us in our Driving Adoption forum on the Microsoft Technical Community. Sharing these real world examples from within your own company is extremely valuable to realizing sustained change over time with your user community.

Learn more about the Microsoft Teams usage reports in the Microsoft 365 admin center.

Next: Schedule service health reviews

Schedule service health reviews for your Microsoft Teams adoption

4/27/2020 • 2 minutes to read • Edit Online

In collaboration with your technical implementation team, plan to hold monthly service health reviews for Teams. In these reviews you will share insights on the following measures:

- **Service usage** – Active usage data, and may include information about services deprecated or consumption reduced as a result of moving to Teams. Typically led by service manager or product owner for collaboration services.
- **Service health** – Call quality, meeting health and overall service health. Review of any support incidents and helpdesk ticket levels. Security and governance topics. Typically led by information protection and support teams.
- **Capability/project roadmap** – What is the schedule of remaining employee onboarding or further collaboration improvement projects? What additional features is your organization going to enable? Typically led by service manager or product owner for collaboration services in collaboration with key business stakeholders.
- **Awareness campaign and training success measure update** – Includes reach, participation, key feedback themes, and open issues. Include key wins and success stories.

This monthly review can be quite formal in large organizations or virtual in smaller companies. It is important to share and monitor this data to ensure a healthy and every increasingly vibrant implementation of Microsoft Teams.

Get started on your upgrade from Skype for Business to Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

Congratulations on your pending upgrade from Skype for Business to Microsoft Teams. Whether you're just getting started with Teams, already using Teams alongside Skype for Business, or ready to upgrade, we want to ensure you have everything you need to navigate a successful journey to Teams.

Whether you are upgrading from Skype for Business Online to Teams or from a Skype for Business on-premises environment to Teams, the upgrade framework will guide you through the process based on your business scenario.

Why upgrade to Microsoft Teams?

Microsoft Teams extends the capabilities of Skype for Business, bringing together chat, meetings, calling, collaboration, app integration, and file storage into a single interface. This new central hub for teamwork can help streamline the way users get things done, improving user satisfaction and accelerating business outcomes. We're continually expanding Teams' capabilities to enable you to communicate and collaborate in new ways, break down organizational and geographical barriers, and drive efficiency in process and decision making. Learn more about the benefits of upgrading to Teams in the Forrester report: Total Economic Impact of Microsoft Teams.

When should my organization migrate to Teams?

Skype for Business Online will be retired on July 31, 2021, after which it will no longer be accessible or supported. While the Skype for Business Online service will be fully functional through July 31, 2021, Microsoft encourages customers to begin their upgrade journey today, allowing ample time to complete their upgrade prior to the retirement date. Read our retirement announcement to learn more.

Can we continue to use Skype for Business Online as we prepare for and execute our upgrade to Teams?

Yes, Microsoft offers several options for running Skype for Business Online and Teams together. These coexistence modes allow your users to become familiar with Teams today while helping accelerate your upgrade to Teams Only. For more information, see https://aka.ms/SkypeToTeams-Coexist.

Is Phone System available for Teams users?

Yes. Phone System is available to all Teams users after they are moved to TeamsOnly mode. In addition, Microsoft provides options for connecting to the Public Switched Telephone Network (PSTN) so that users can make phone calls anywhere in the world. For more information, see Voice - Phone System and PSTN connectivity.

Can we continue to use our on-premises telephony infrastructure?

Yes. With Phone System Direct Routing, you can use Phone System with virtually any telephony carrier. With Direct Routing, you connect your own Session Border Controller (SBC) directly to Phone System. For more information, see Phone System Direct Routing.

How is Microsoft helping customers with their migration to Teams?

Microsoft is committed to helping make your transition from Skype for Business to Teams a success. Microsoft is providing robust guidance built around a proven, end-to-end upgrade success framework designed to help you plan and execute the upgrade to Teams. Our guidance is designed for every stage of the upgrade journey, whether you are just getting started with planning, already running Teams alongside Skype for Business, or ready to upgrade to Teams.

To help facilitate your upgrade planning and implementation, Microsoft is hosting complimentary live, interactive upgrade planning workshops, designed to familiarize yourself with our upgrade framework, share insights into preparing your users for the upgrade, and identify the right path for your organization on your journey to Teams. Join us for an upgrade planning overview session: https://aka.ms/SkypeToTeamsPlanning.

Why do I need upgrade guidance? Can't I just delete/decommission Skype for Business?

Upgrading from Skype for Business to Teams is more than a technical migration. It represents a transformation in how users communicate and collaborate, and change is not always easy. The ideal upgrade approach should address the technical aspects of your upgrade as well as encourage user acceptance and adoption of Teams, driving a positive user experience and business outcome realization.

Where do I start planning for Teams/my upgrade to Teams?

Start your journey by familiarizing yourself with our upgrade success framework and associated resources. This guidance serves as the cornerstone for navigating your journey from Skype for Business to Teams.

Learn about the Upgrade Framework and join us for a live upgrade planning overview session.

> **IMPORTANT**
>
> Remember that a successful upgrade ensures both technical and user readiness, so be sure to leverage the guidance herein as you navigate your journey to Microsoft Teams.

> **TIP**
>
> Watch the following sessions to learn about the Upgrade from Skype for Business to Microsoft Teams:
>
> - Introduction to Upgrade
> - Plan your upgrade
> - Coexistence and Interoperability
> - Administrator experience

About the upgrade framework

12/5/2020 • 8 minutes to read • Edit Online

To help take the guesswork out of your upgrade journey, we've employed a proven framework for implementing change. As illustrated below, each step in the framework builds on the step prior and, for optimal results, we recommend following the steps in order.

Begin by bringing together the right stakeholders and defining your upgrade plan (e.g. scope, goals and timeline). With a plan in place, confirm your technical environment and your end-users are ready for Teams. Then, implement your upgrade in stages, moving from a pilot to an organization-wide upgrade when ready. Once your organization is on Teams, establish an operational plan that monitors for quality and accelerates user adoption.



Look for this framework graphic on related pages to identify where you are in the upgrade process.

Sample upgrade timeline

Your upgrade journey begins when you start planning for the change. Leveraging the success framework as a guideline, below is a sample timeline that take you from the pre-upgrade phase where you will plan and prepare for your upgrade, through the upgrade and into the post-upgrade operational phase, designed to sustain and amplify your outcomes.

> **NOTE**
> We understand that your journey to Teams might involve leveraging multiplemodesand upgrading groups of users at different times, which will enable you to control the user upgrade experience while maintaining momentum with Teams.

To help demonstrate how your upgrade journey might unfold, we've provided a sample plan below that defines a journey going from Skype for Business Online toIslandsmode to Teams only. In addition, the sample plan outlines an organization that has divided their users into four upgrade groups, orcohorts. Using this as a template, customize the plan to encompass your specific journey to Teams, incorporating the variousmodesyou'll use and the number of upgrade groups you'll segment your users into.

Pre-upgrade

Prepare your organization for Teams. To help ensure a successful upgrade to Teams, it's important to allocate adequate time for preparation. Not only will your organization be able to quickly start realizing the value of Teams, you'll be able to accelerate your upgrade from Skype for Business as soon as Teams is ready for you. If you've already enabled Teams alongside Skype for Business, use these pre-upgrade activities as a checkpoint to validate your organization's readiness before you upgrade users to Teams.

TIP

Download theUpgrade Success Kitfor template user readiness materials, such as communications and user surveys, in addition to a sample upgrade project plan and pilot test plan. Items that are available in the kit are marked with an asterisk (*) in the lists below.

Plan: Create your upgrade plan to help ensure your organization is set up for long-term success

STEP		SUMMARY	RESOURCE
1	**Define your stakeholders**	Assign project team members accountable for driving upgrade success.	Enlist your stakeholders
2	**Define your project vision and scope**	Design your "big picture" vision and current project scope to create a blueprint for your upgrade journey.	Project vision Project scope
3	**Define your project goals**	Set targeted goals that enable you to measure progress as well as project success.	Project goals
4	**Identify risks and mitigation plans**	Establish a mitigation plan to ensure you can quickly get your project back on track should issues arise.	Risks and mitigation
5	**Define your timeline**	Set a timeline and key milestones to help your project stay on time and on budget.	Timeline Upgrade Success Kit
6	**Define the appropriate Skype for Business and Teams upgrade and coexistence strategy**	Map your journey to ensure the best path from Skype for Business to Teams for your organization.	Understand Microsoft Teams and Skype for Business coexistence and interoperability Understand Phone System and PSTN connectivity options Choose your upgrade journey

Prepare: Evaluate your organization's readiness for Teams

STEP		SUMMARY	RESOURCE
1	**Assess your environment and complete Teams technical onboarding**	Ensure your environment is ready for Teams to help optimize the user experience and facilitate your upgrade over time.	Evaluate your environment before upgrading to Teams. Prepare your service for upgrading to Teams

STEP		SUMMARY	RESOURCE
2	**Optimize network for Teams, particularly for real-time media scenarios**	If you're deploying audio, video, or meetings, take these additional steps to optimize your network for that functionality.	Prepare your network for upgrading to Teams
3	**Assess organizational change readiness and define teamwork scenarios**	Understand your user base to prepare the right value messaging and level of education to facilitate and accelerate user adoption.	Organizational change readiness
4	**Prepare a user readiness plan to define how you will communicate, train, and support users**	Personalize your communications, training, and support plan to ensure optimal receptiveness to the new technology.	Prepare a user readiness plan Upgrade Success Kit
5	**Announce the pending launch of Microsoft Teams**	Communicate early to help users feel included, reduce confusion, and generate excitement.	Upgrade Success Kit
6	**Prepare your IT staff for Teams**	Confirm your technical and support staff has everything they need to ready and support your technical environment for Teams.	Prepare your IT staff for Microsoft Teams Upgrade Success Kit

Pilot: Run a pilot to confirm that your organization is ready and inform your optimal journey to Teams

STEP		SUMMARY	RESOURCE
1	**Outline pilot logistics**	Define formal pilot logistics to help validate your organization's readiness to upgrade or coexist.	Outline pilot logistics
2	**Select your pilot participants and test scenarios**	Identify users who can help validate teamwork scenarios and verify Teams readiness.	Select your pilot participants and test scenarios
3	**Design your test plan and feedback survey**	Identify clearly defined tasks for participants to complete and a way for them to share their feedback.	Design your test plan and feedback survey
4	**Create your pilot communications plan**	Educate pilot participants on what's happening, when, and why, and what's expected of them.	Create your communications plan Upgrade Success Kit
5	**Conduct your pilot**	Start your pilot, track progress and iterate as needed to optimize your pilot results.	Conduct your pilot

STEP		SUMMARY	RESOURCE
6	**Assess learnings and evaluate your go-forward plan**	Gather user feedback, network stats, and support tickets for analysis against your goals and determine your go-forward plan.	Assess learnings and evaluate your go-forward plan

Deploy: Run Teams in coexistence with Skype for Business

STEP		SUMMARY	RESOURCE
1	**Announce the official launch of Teams**	Generate excitement and momentum by sending an official launch announcement when Teams is ready.	Upgrade Success Kit
2	**Implement your upgrade**	The steps you take depend on your current deployment of Skype for Business.	Implement your upgrade
3	**Stay informed about the Teams roadmap**	Monitor the Teams roadmap to identify the right time for your organization to move to Teams.	Teams roadmap
4	**Send additional communications and engage Teams champions to drive excitement and adoption of Teams**	Encourage user adoption and maintain excitement for Teams with ongoing communications and champions.	Microsoft 365 Champions Program

Upgrade

Make the official move to Teams. When you upgrade your users, you move them into Teams only mode. Teams becomes their primary app for chat, meetings, calling, and collaboration, and access to the Skype for Business app is disabled. Although the technical aspects of this phase are quite simple, consider the effect the change might have on user experience and allow time for users to officially transition their activities from Skype for Business to Teams. To reduce users having different experiences with different clients, try to limit the end-to-end upgrade window to 45 days or so.

Upgrade: Implement your upgrade from Skype for Business to Teams

STEP		SUMMARY	RESOURCE
1	**Confirm that you've completed the pre-upgrade activities described above**	Help ensure upgrade success by confirming completion of all planning and preparation activities.	All the above
2	**Initiate communications to users in your first upgrade group**	Notify users that upgrades are starting, and keep them informed throughout the process.	Prepare a user readiness plan Upgrade Success Kit

STEP		SUMMARY	RESOURCE
3	**Enable the coexistence mode to Teams Only for users in your first upgrade group**	Follow steps appropriate to your Skype for Business environment to perform the technical user migration.	Upgrade from Skype for Business Online to Teams Upgrade from Skype for Business on-premises to Teams
4	**Repeat the preceding upgrade activities for the remaining upgrade groups on a rolling cycle**	Continue to drive your ongoing communications plan and upgrade user groups based on your plan.	
5	**Send post-upgrade feedback surveys to all users**	Use a feedback survey to capture feedback and insights from users.	Upgrade Success Kit

Post-upgrade

Maximize business value with Teams. After your organization is fully upgraded to Teams, take time to evaluate your success against your goals and implement a plan to continue forward momentum.

Operate: Measure the success of your upgrade

STEP		SUMMARY	RESOURCE
1	**Assess your initial upgrade success**	Evaluate progress against the goals you established in the pre-upgrade phase.	Project goals
2	**Implement a mitigation plan for any goals that aren't on track**	Define mitigation or course-correction strategies for goals that are not being met.	Project goals
3	**Monitor for network health and quality**	Implement a quality check and monitoring plan to help ensure a positive user experience as well as reduce calls to your support desk.	Monitor for network health and quality
4	**Drive user momentum and adoption**	Encourage user adoption and maintain excitement for Teams with an ongoing adoption plan.	Drive user momentum and adoption
5	**Prepare for new functionality**	Realize maximum value by establishing a change cycle for new innovations and product improvements.	Prepare for new functionality

NOTE

Our Upgrade content is continually evolving. Be sure to check back for the latest guidance, and read the Teams blog.

IMPORTANT

Skype for Business Online will be retired on July 31, 2021, after which it will no longer be accessible or supported. To maximize benefit realization and ensure your organization has proper time to implement your upgrade, we encourage you to begin your journey to Microsoft Teams today. Remember that a successful upgrade aligns technical and user readiness, so be sure to leverage the guidance herein as you navigate your journey to Microsoft Teams.

Plan for your upgrade

12/5/2020 • 2 minutes to read • Edit Online



A healthy technical environment, sustained user adoption, and the realization of your business goals all begin with proper planning. A solid plan gives you a framework for your upgrade project and ensures that all stakeholders are working toward the same goals. By taking time to properly define success, you can measure results as you progress through your deployment and verify that you're achieving the outcomes you wanted. Planning your journey includes:

- Enlisting your project stakeholders
- Defining the scope of your project
- Understanding coexistence and interoperability of Skype for Business and Teams
- Choosing your upgrade journey based on your business needs
- Planning a user pilot

After you've planned your journey, you will read topics about preparing your environment and preparing your organization before you implement your upgrade.

> **TIP**
>
> Join us for live, interactive workshops in which we'll share guidance, best practices, and resources designed to kick start upgrade planning and implementation.
>
> Join the Plan your upgrade session first to get started.

Enlist your project stakeholders

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This article is part of the Project Stakeholders stage of your upgrade journey, the first and most essential activity you complete for your project's success.

From implementing project deliverables to driving accountability, your stakeholders hold the key to the success of your project. There are two groups of stakeholders you'll want to assign: (1) a *sponsorship coalition* that includes executive and project sponsors who have a vested interest in and influence on the project's success, and (2) the *project team*, consisting of the people responsible for ensuring technical and user readiness, who will complete the various tasks in the project plan. The common thread between these two groups is the *project manager*, who works to ensure that project tasks get completed on schedule and reports project status back to the coalition.

> **TIP**
> Take time to identify the ideal executive sponsor, someone who can help set the tone of your project, leads by example, and holds others accountable. This should be a senior manager or executive who has authority over the project scope and vision. They should also be the final decision-maker in removing blockers and resolving conflict to help keep the project on time and on budget.

Optionally, you can create a steering committee. Sometimes large or more complex projects end up with "too many cooks in the kitchen," resulting in disconnects among the stakeholder groups. For these projects, you might want to form a steering committee. A steering committee is responsible for driving decisions, providing strategic oversight, supporting the project's initiatives, and—when necessary—removing blockers. You can find more information about implementing a steering committee in the steering committee guide.

Decision points	• Who are the right people to serve as your stakeholder team for this project?
Next steps	• Consider the scope of your project and assign the relevant stakeholders. • Use the following table as a guideline, but note that this list isn't all-inclusive. **Tip** Build a responsible-accountable-consulted-informed (RACI) matrix to further distinguish those who will be held accountable from those who simply need to be kept informed in a particular area of the project.
• Decide whether to create a steering committee, and assign roles as appropriate.	

ROLES	RESPONSIBILITY
Sponsorship coalition	
Executive Sponsor	Drives overall messaging and accountability
Business Sponsor	Facilitates new technology requests for their business unit
Department Managers	Represents the teams most affected by this change
Human Resources Manager	Is accountable for talent management
Project Manager/Lead	Oversees the transition project, ensures completion of all tasks
Project team	
Collaboration Lead/ Architect	Creates and implements the solution architecture
Network Lead	Provides insights into network design and execution
Security Lead	Provides insights into security design, process, and implementation
Synchronous Communications Lead	Owns presence tooling such as chat, meetings, and calling
Asynchronous Collaboration Lead	Owns asynchronous tooling such as SharePoint, OneDrive, and so on
Telephony Lead	Provides insights into telephony design and implementation
Service Owner/ Quality Champion	Owns the operation of Teams all-up, including the quality of the user experience
Desktop and Devices Lead	Provides input into clients, devices, and desktop apps
IT Pro/Tenant Admin	Ensures the network readiness and Microsoft 365 admin center configurations are in place
Support/Help Desk Lead	Manages the readiness of your support desk
Change Management Lead	Oversees the user change management and adoption program
Marketing Lead	Designs and implements communications campaigns
Training Lead	Designs and implements training plans

After you've gathered your stakeholders, proceed to the next step: Define your project scope.

Define your project scope

12/5/2020 • 7 minutes to read • Edit Online



This article is part of the Project Definition stage of your upgrade journey, an activity you complete after you create a sponsorship coalition and project team from the stakeholders you've identified are key to your project's success. Before proceeding, confirm that you've completed the following activities:

- Enlisted project stakeholders

Taking time to define your project vision, scope, goals, and governance will help ensure all project stakeholders are aligned and working toward the same end results. This is especially critical given that the technical readiness team and user readiness team will be working independently to pull their respective pieces together. After you complete this section, refer to it throughout your project to ensure you're on track to achieve the end state you wanted. Use the goals that you identify below to measure against your outcomes, and mitigate as needed.

Decision points	• What do you want to accomplish with this project (in other words, why are you doing it)? • What does success look like? • What are the risks, and what's your plan to mitigate those risks?
Next steps	• Discuss the following sections with your project team and sponsors. • Document your vision, scope, goals, and risks for this project. • Revisit your project team to validate that you've engaged the right team.

Project vision

Your vision is the "big picture" or eventual end-state that answers the question, "Why are we doing this project?" An ideal vision addresses your organization's business drivers and user value-add perspectives, as shown in the following examples:

- **Organization business driver**: Standardizing on Microsoft Teams aligns with our digital workplace transformation and enables us to drive operational efficiencies, eliminate redundant solutions, and save USD5 million.
- **User value-add**: Microsoft Teams (1) saves time by providing a single location for project notes, Office docs, team members, conversations, and meetings; (2) simplifies communication by using a centralized contact list and persistent chat tracking for quick access to your conversations, and (3) alleviates the frustration of trying to find that lost email attachment by storing and accessing files in one place.

Consider the following discussion points to help refine your vision:

- Description of the current business process

- Challenges with the existing business process
- How technology can help overcome these challenges
- The expected and measurable business outcomes if these challenges are overcome

> **TIP**
> Identify use cases and personas to further refine your project vision.

Project scope

Your vision might only be realized over time, through various phases. The project scope defines the focus of your project *at this time* and serves to keep your project team focused on their current tasks, enabling you to realize your long-term vision. For example, your scope might call for you to run a pilot, deploy a specific workload such as voice or meetings, or enable Teams alongside Skype for Business as you plan for your upgrade over time. As part of the project scope, you should assess:

- The various coexistence modes, and which would be optimal for your organization.
- The best way for Skype for Business and Teams to coexist before you move to Teams.
- Whether you should conduct a pilot to validate technical and user readiness in your organization.

Project goals

Your goals define the outcome you want and enable you to measure the success of the project. Goals can be defined as *objectives and key results* (OKRs), and the measures of project success can be defined as *key success indicators* (KSIs). It's essential that you get full participation from project stakeholders in defining OKRs and KSIs, to help ensure they feel a sense of ownership and align these measures of success to defined project tasks. Goals should include a mix of technical and user-focused success.

- **OKRs** contain the objectives you set at the beginning of the project and the key results you measure on a defined cadence (for example, monthly or quarterly). By reviewing your key results, you can ensure your project deliverables are on schedule, or identify and mitigate issues to get your project back on track. OKRs are typically categorized as "achieved" or "not achieved."
- **KSIs** measure quality and success of the key results and complement the binary nature of OKRs by detailing good and/or bad results. When defining KSIs, we recommend that you use "specific, measurable, assignable, realistic, time-related" (SMART) criteria:
  - Specific: target a specific area for improvement
  - Measurable: quantify, or at least suggest an indicator of, progress
  - Assignable: specify who will do it
  - Realistic: state what results can realistically be achieved, given available resources
  - Time-related: specify when the results can be achieved

The following table shows examples of OKRs and KSIs for the initial phases of a Skype for Business to Teams upgrade project.

OBJECTIVE	KEY RESULT	TO DO

OBJECTIVE	KEY RESULT	TO DO
Pilot Teams alongside Skype for Business, in collaboration-only mode	FY19Q2: 500-user pilot conducted and completed	• Identify pilot users • Create a pilot test plan • Enable pilot users on Teams • Implement the pilot • Execute a pilot feedback survey • Measure pilot success
Successfully run collaboration-only mode for all users in the organization alongside Skype for Business	• 60% of Skype for Business users are using Teams within 30 days of rollout • User satisfaction with Teams is ≥80%	• Design and execute a broad communications and training plan • Enable all users for Teams in collaboration-only mode • Track usage monthly • Gather user feedback • Monitor network health/quality • Mitigate as needed

TYPE	KEY SUCCESS INDICATOR	HOW MEASURED	SUCCESS CRITERIA	MEASURED
Network and quality	Percentage of poor audio calls should be minimal	Call Quality Dashboard (CQD)	<3% of poor calls with Teams	Weekly, then monthly
Usage and awareness	The chat, meetings, and calling experience is equal to or better than Skype for Business	Survey	80% agree or strongly agree	Weekly through pilot, post-rollout
Usage and adoption	Users actively use the solution	Microsoft 365 reports or CQD	90% participation from pilot users, better than the current solution	Weekly, then monthly
Usage and training	I had adequate training/help resources to successfully use Teams	Post-pilot survey	80% agree or strongly agree	Post-pilot, post-rollout
User satisfaction	I would recommend Teams to others	Net Promoter Score (NPS) via post-pilot survey	NPS > 0	Post-pilot, post-rollout
Business driver	Cost savings	Accounts Payable	$X million cost expenditure in third-party solutions	Six months, then one year, then five years post-rollout

TIP

To help ensure your project stays on track, consider defining smaller, short-term milestones in addition to bigger, long-term goals. This can include metrics that you'll capture as part of your user pilot. When considering your timeline, use the Microsoft 365 Roadmap if you're waiting for features that aren't yet available in Teams.

Risks and mitigation

With any project, unforeseen events or other factors can arise and throw your project off track. It's important to proactively assess potential risks and define a mitigation plan for overcoming the issues that might arise, so your project can continue toward your goals. A *risk register* is an excellent tool for tracking project risks—along with how likely they are and their potential impact—and capturing your mitigation plan. The following table shows a sample risk register.

RISK	LIKELIHOOD	IMPACT	OVERALL	MITIGATION PLAN
Network quality	Medium	High	High	Execute a network planning exercise.
Low user adoption	High	High	High	Proactively work with users during the pilot and deployment phases; implement a targeted awareness and training campaign to create desire.

Timeline

As you scope your upgrade journey, be sure to set a timeline for key milestones (for example, enabling Teams alongside Skype for Business for all users) in addition to the completion date. A defined timeline helps your project team drive toward a consistent end state and informs the right work-back schedule, helping to ensure that your project stays on track. Consider a timeline that's not too accelerated (where tasks might be overlooked) or too distant (where momentum might be lost). The ideal timeline accounts for:

- **Product readiness for compliance and user scenario requirements**: Refer to the product roadmap to gauge when Teams will be ready for your organization.
- **Upgrade groups**: Determine whether you'll be enabling Teams or upgrading users by upgrade groups, which could affect the timeline of your overall upgrade journey.
- **Organizational factors such as change freeze, fiscal year end, deployment lifecycles**: Discuss and account for any internal processes that might influence your upgrade timeline.
- **Other changes that are occurring at or around the same time**: Consider bundling changes or spacing them out to facilitate a positive user experience and minimize any impact on productivity.
- **Resourcing**: Confirm resource allocation with your project stakeholders to ensure that the project team you've brought together has enough bandwidth to complete all necessary tasks.

As a reference point, a sample timeline is provided for the pre-upgrade, upgrade, and post-upgrade phases of the Upgrade Pro journey, which we encourage you to adjust as needed to align with the specific needs of your organization.

After you've completed the activities described above, you should have a solid foundation for your project. Continue with your technical readiness and organizational readiness planning activities.

Remember: Skype for Business Online will be retired on July 31, 2021. After that time, the Skype for Business Online service will no longer be accessible or supported. To maximize benefit realization and ensure your organization has proper time to complete your upgrade, we encourage you to begin your journey to Microsoft Teams today.

Understand Microsoft Teams and Skype for Business coexistence and interoperability

12/5/2020 • 15 minutes to read • Edit Online



This article is part of the Project Definition stage of your upgrade journey, an activity you complete after you create a sponsorship coalition and project team and define the scope, goals, and vision for your project. Before proceeding, confirm that you've completed the following activities:

- Enlisted your project stakeholders
- Defined your project scope

If your organization uses Skype for Business today and you are starting to use Teams alongside Skype for Business—or you are starting to upgrade to Teams—it's important to understand how the two applications coexist, when and how they interoperate, and how to manage users' migration all the way to their eventual upgrade from Skype for Business to Teams.

> **TIP**
>
> Watch the following session to learn about Coexistence and Interoperability.
>
> Additionally, you can join us for live, interactive workshops in which we'll share guidance, best practices, and resources designed to kick start upgrade planning and implementation.
>
> Join the Plan your upgrade session first to get started.

Coexistence of Teams and Skype for Business

In addition to collaboration capabilities, Teams delivers chat, calling, and meeting capabilities. Depending on how you choose to deploy Teams, these capabilities may overlap with the capabilities delivered by Skype for Business for a given user. The default mode is to run Teams alongside Skype for Business with the capabilities overlap; however, a user can be assigned one of several coexistence modes (also known as upgrade modes) that were designed to ensure that these capabilities don't overlap for that user (in which case interoperability between Teams and Skype for Business is available). For example, if you have significant Skype for Business Server on-premises assets with a complex Enterprise Voice deployment but want your users to enjoy modern meetings as quickly as possible, you might want to evaluate Meetings First as an alternative path.

We recommend that you review the following coexistence modes to help determine which path is right for your organization.

> **IMPORTANT**
>
> Introducing new technology or making changes to your existing, familiar Skype for Business environment, while delivering great new business benefits, can be disruptive for users. Take time to assess user readiness and implement a communication and training plan before you implement any of the changes outlined in this article. In addition, we strongly encourage you to pilot your plan with a selected group of users before implementing it across your organization.

Islands mode

By default, users can run Teams alongside Skype for Business as two separate solutions that deliver similar and overlapping capabilities such as presence, chat, calling, and meetings. Teams users also can take advantage of new collaboration capabilities such as teams and channels, access to files in Microsoft 365 or Office 365, and applications.

In this coexistence mode, called **Islands**, each of the client applications operates as a separate island. Skype for Business talks to Skype for Business, and Teams talks to Teams. Users are expected to run both clients at all times and can communicate natively in the client from which the communication was initiated. As such, there's no need for interoperability in **Islands** mode.

To avoid a confusing or regressed Skype for Business experience, external (federated) communications, PSTN voice services and voice applications, Office integration, HID controls for USB devices, and several other integrations continue to be handled by Skype for Business and are not available in Teams in **Islands** mode. Phone System is not supported in Teams in **Islands** mode; in this mode, the only Enterprise Voice client is Skype for Business.

> **IMPORTANT**
> In **Islands** mode, all messages and calls from federated users (people outside your organization) are delivered to Skype for Business. After upgrading to **Teams Only** mode, all messages and calls from outside your organization are delivered to Teams.

> **TIP**
> Skype for Business Online customers recommended path is to start with the default **Islands** mode, drive Teams adoption saturation in the organization, and then move to **Teams Only** mode rapidly. On premises and hybrid customers, especially complex ones, might benefit from deploying the **Skype for Business with Teams Collaboration** mode as a starting point rather than **Islands** mode, and progress from there to **Skype for Business with Teams Collaboration and Meetings** mode (that is, Meetings First), if appropriate, and to **Teams Only** mode when the organization is ready to adopt Teams.

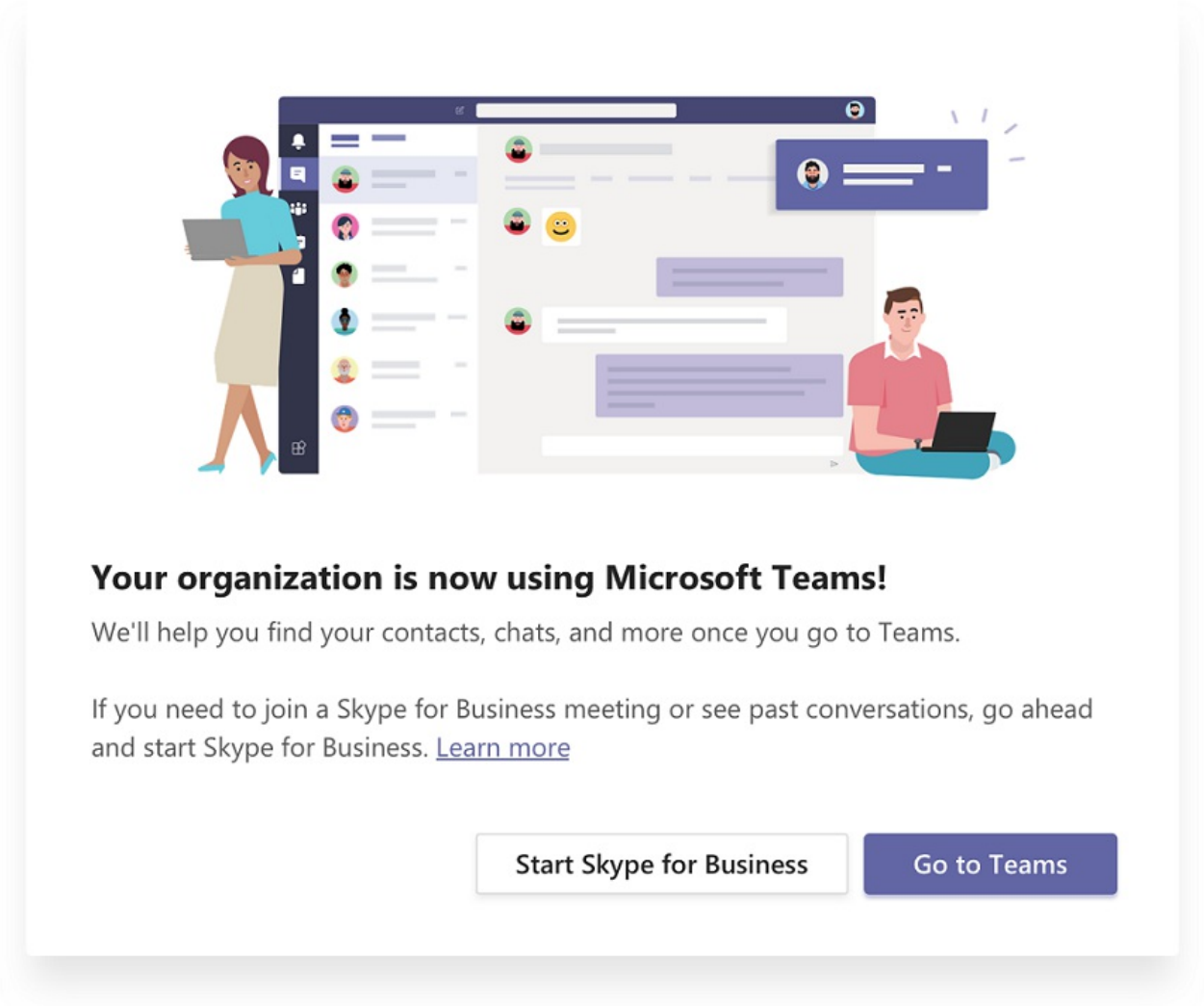
Teams Only

A **Teams Only** user (also called an *upgraded* user) has access to all the capabilities in Teams. They may retain the Skype for Business client to join meetings on Skype for Business that have been organized by non-upgraded users or external parties. An upgraded user can continue to communicate with other users in the organization who are still using Skype for Business by using the interoperability capabilities between Teams and Skype for Business (provided these Skype for Business users are not in **Islands** mode). However, an upgraded user can't initiate a Skype for Business chat, call, or meeting.

As soon as your organization is ready for some or all users to use Teams as their only communications and collaboration tool, you can upgrade those users to **Teams Only** mode. If you are upgrading from **Islands** mode, we advise that you first saturate Teams adoption throughout your organization before beginning the upgrade process. This avoids broken communication scenarios due to **Islands** mode not providing interoperability.

When in **Teams Only** mode, Teams is the default app for the SIP/Tel protocol. This means that links in a user's contact card in Outlook for calling or chat will be handled by Teams.

For additional considerations about moving to **Teams Only** mode, see Teams Only mode considerations.



Skype for Business only

In this coexistence mode, users remain in Skype for Business—not Teams—for chat, meeting, and calling capabilities, and they don't use Teams for teams and channels. This mode is available today; however, in the current implementation, teams and channels are not automatically turned off for the user. This can be achieved by using the App Permissions policy to hide teams and channels.

This mode can be used prior to starting a managed deployment of Teams to prevent users from starting to use Teams ahead of having built readiness, or as a way to enable authenticated participation in Teams meetings for Skype for Business users, provided the users are licensed for Teams.

Skype for Business with Teams Collaboration

Use this mode to introduce Teams in your environment while you continue to leverage your existing investment in Skype for Business. In this mode, you leave Skype for Business unchanged for chat, calling, and meeting capabilities, and you add Teams collaboration capabilities—teams and channels, access to files in Microsoft 365 or Office 365, and applications. Teams communications capabilities—private chat, calling, and scheduling meetings—are off by default in this mode.

Organizations with a starting point of Skype for Business Server on premises or hybrid should consider this mode as an alternative to **Islands** mode if they want to give their users interoperability and predictability for their communications, as well as having a predictable timeline for their upgrade to Teams (as opposed to relying on adoption saturation in **Islands** mode).

Skype for Business with Teams Collaboration and Meetings, also known as Meetings First

Use this coexistence mode to accelerate the availability of Teams meeting capabilities in your organization, in addition to its collaboration capabilities, enabling your users to take advantage of the superior Teams meetings experience-great quality, innovative capabilities such as transcription and translation or background blurring, and

superior user experience across all platforms, including mobile devices and browsers.

Along with using Teams for teams and channels–based conversations in this mode, users will use Teams to schedule and conduct their meetings. Private chat and calling remain on Skype for Business. Teams and Skype for Business benefit from a range of "better together" capabilities, such as presence reconciliation, automatic hold/unhold, and HID device support across both applications. Note that it is possible to hide teams and channels if desired using the App Permissions policy.

This coexistence mode is especially useful for organizations with Skype for Business on-premises deployments with Enterprise Voice, who are likely to take some time to upgrade to Teams and want to benefit from the superior Teams meetings as soon as possible.

> **TIP**
> To help identify the recommended upgrade mode based on the capabilities you want to enable in Teams while Skype for Business is still in use, leverage the Skype to Teams Upgrade Wizard.

For more details about coexistence modes, prerequisites, and management, see Migration and interoperability guidance for organizations using Teams together with Skype for Business and Setting your coexistence and upgrade settings.

	Decision point	• Which coexistence mode(s) best fit your organization's and users' needs?
	Next step	• Choose the best approach for your upgrade journey.

Interoperability of Teams and Skype for Business

Interoperability is the ability for Teams and Skype for Business users in the same organization to communicate across Teams and Skype for Business.

Interoperability is governed by the coexistence mode (also known as upgrade mode) of the receiver. There is no interoperability when the receiver is in **Islands** mode.

> **NOTE**
> When deployed in any coexistence mode except **Islands**, Teams and Skype for Business can interoperate, enabling users to chat with and call one another, and ensuring that communications remain fluid across your organization during your upgrade journey to Teams. Coexistence modes govern interoperability. The coexistence mode of the receiver determines whether interoperability will be available. For example, if the receiver is in a mode in which chat is only available in one client (say, Teams), chat interoperability will generally be available in case the initiator uses the other client (in this case, Skype for Business) to start the chat. On the other hand, if the receiver is in the mode in which chat is available in both clients (Islands mode), interoperability won't be available for the chat. The message will be received by the receiver in the same client in which the initiator started the chat. Therefore, proper communication in **Islands** mode requires Teams adoption saturation; that is, all users actively using and monitoring both clients.

> **NOTE**
>
> To have the latest coexistence experience, the client version must be the latest available client in the user's Office deployment channel.

Native interop and interop escalation

There are two types of interop experiences: native and interop escalation.

- A *native interop* experience occurs in the client that the user is currently using. One user will be in the Skype for Business client, the other in Teams. A native interop experience won't take them to another client to communicate, the users will be able to conduct their conversation in the client they're currently using. The native interop experiences are one-to-one chat and calling.
- An *interop escalation* experience means that as part of helping users perform an advanced action (such as sharing their desktop), the client facilitates the creation of a meeting which users can join to continue the experience in that meeting. The meeting is created on the platform of the initiator of the action. The user or users who aren't on that platform receive a meeting join link. As they click this link, they are joined to the meeting in a compatible client (browser, web app, or full client, depending on configuration). Interop escalation from Skype for Business requires a recent client. Interop escalation from Teams is now available. Both are supported in interoperability experiences in-tenant, and for federated communication cross-tenants.

Native interop experiences

Depending on the coexistence modes assigned to users (as previously described), the following native interop experiences are available:

Skype for Business users can chat one-on-one with Teams users, and vice versa. An interop chat needs to go through an interop gateway that's part of Teams cloud services (and therefore only exists online). Interop chats are plain text: rich text and emoticons aren't supported. Users in Teams and in Skype for Business are notified that the conversation is an interop conversation.

Skype for Business users can make one-on-one voice and video calls to Teams users, and vice versa.

> **IMPORTANT**
>
> Interop experiences with an on-premises deployment of Skype for Business require that the on-premises environment is in hybrid mode with Microsoft 365 or Office 365 Skype for Business. For details, see Migration and interoperability guidance.

These interop experiences are available to and between users who have one of the following coexistence modes assigned: **Skype for Business with Teams Collaboration**, **Skype for Business with Teams Collaboration and meetings**, **Skype for Business Only**, or **Teams Only**. There is no interoperability to users in **Islands** mode.

Native interop experience limitations

Because of the difference in protocols and technology, it is not possible to support all capabilities natively. Specifically, the following capabilities are not available:

- Markdown, rich text, and the full emoticon set aren't supported either from Teams or Skype for Business. Other native features of the compose box in Teams chats aren't supported.
- Screen sharing (desktop or app sharing) between Teams and Skype for Business isn't supported natively. However, it is supported through interop escalation.
- Group chats (multiple-party conversations) in Teams can only include participants who are using Teams.
- Multiple-party IM conversations (group chats) in Skype for Business can only include participants who are using Skype for Business. However, interop escalation to multiple-party is available from Skype for Business.
- Escalating an ongoing peer-to-peer voice or video call to a multiple-party call involving both Teams and Skype

for Business users isn't supported.

- File transfer for two-party chats, or file attachment in group chats, from Teams to Skype for Business—and vice versa—aren't supported.
- There is no interoperability with Skype for Business Persistent Chat.

For all these limitations (except for Persistent Chat), one possible workaround is for one user to start a meeting and invite the other user to join it.

This workaround is the basis for interop escalation. In particular, screen sharing and escalation to multiparty are not achievable natively but they are supported via interop escalation.

Interop escalation experiences

Interop escalation consists in supplementing the native interop capabilities with managed escalations to meetings. Meetings offer rich experiences available to anyone, regardless of which client they have.

When interop escalation is triggered by the Teams user, a Teams meeting is created. When it is triggered by the Skype for Business user, a Skype for Business meeting is created. In both cases, the meeting created is a **Meet now** meeting, which is not reflected on the user's calendar.

The other party receives the meeting join link through interop chat and joins by clicking that link. If the Skype for Business user has a Teams account and is invited by the Teams user, they will join the meeting authenticated. Otherwise, they will join as an anonymous participant. Conversely, Teams users almost always have a Skype for Business account and a Skype for Business client they can use to join a Skype for Business meeting as an authenticated participant, but they might also join as an anonymous participant, for example using the Skype Meeting App.

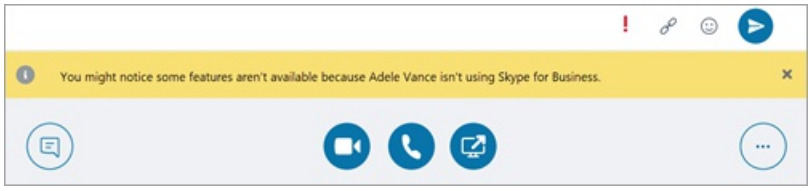
Once the parties have joined the meeting, they can conduct any activity supported in meetings, such as desktop or content sharing, file sharing or transfer, adding other participants, and so on.

Interop escalation from Skype for Business

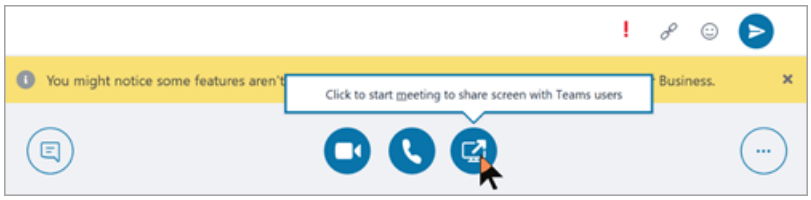
Interop and interop escalation from Skype for Business was updated in the July 2019 build of monthly C2R. Previously, Skype for Business did not have advance awareness that the remote party was using Teams. It only surmised that from the signaling received after a session was established.

When the signaling indicated that the response came from (or through) the interop gateway, it would display the yellow business bar (banner) indicating the other party was not using Skype for Business. With the evolution of our service, this resulted in false positives where Skype for Business users would see the business bar when they were connected to the Cloud Voicemail Service or other cloud voice services, rather than to an actual **Teams Only** user.

To prevent these false positives, the presence service is now informing the Skype for Business client when the other party is a **Teams Only** actual user. This allows Skype for Business to be aware that it needs to create an interop conversation ahead of it having been created, and the conversation window to be specific to interop.



If the Skype for Business user wants to share their desktop for example, they are informed that we will start a meeting and guided through the steps.



Meanwhile, the Teams user receives an incoming chat message with the link to the meeting and are guided to join.

This escalation to a Skype for Business meeting is available for both in-tenant interop and cross-tenant federated calls and chats. It is on by default and there is no setting the admin has to provision.

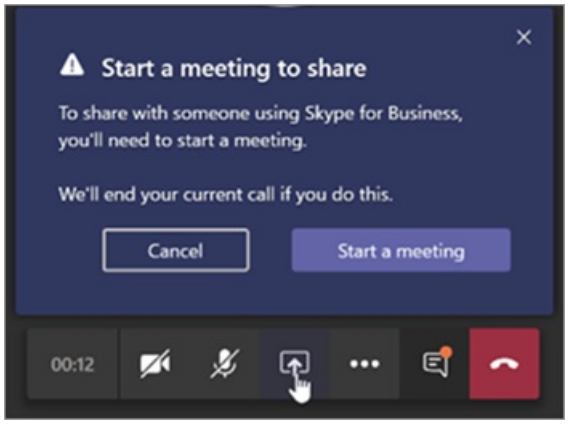
Interop escalation from Teams

Interop escalation from Teams to a Teams meeting is now available when the Teams user selects the desktop sharing button in an in-tenant interop thread with a Skype for Business user or in a cross-tenant interop federation thread. Interop escalation is supported from a 1:1 chat conversation or from a 1:1 call.

The capability is supported in the Teams desktop client for Windows, in the Teams desktop client for Mac, and in the Teams web client on browsers where content sharing is supported, while in communication with any Skype for Business client version.

In interoperability threads, and in federation interoperability threads, the Teams user now has the controls (button) to start content sharing. When the Teams user selects the button, they are presented with an additional menu that informs them that to share content, they will need to start a Teams meeting.

If the users were in a call, the menu also warns them that their current call between Teams and Skype for Business will be terminated as they are put into a Teams meeting. If they so choose, they can warn the Skype for Business user prior to accepting.



Upon acceptance, they are put in the Teams meeting; they must start sharing from the sharing tray in the meeting.

Meanwhile, the Skype for Business user receives an incoming chat message with the link to the meeting and are guided to join.

This escalation to a Teams meeting is available for both in-tenant interop and cross-tenant federated calls and chats. It is on by default and there is no setting the admin has to provision. However, it is turned off for the user if the admin sets `-AllowPrivateMeetNow` in `CsTeamsMeetingPolicy` to `$false`.

After you review this article, see Choose your upgrade journey, Migration and interoperability guidance, Coexistence with Skype for Business, and Setting your coexistence and upgrade settings for implementation details.

Related Links

Video: Manage Coexistence and Interoperability between SfB and Teams

Plan your Teams voice solution

12/5/2020 • 13 minutes to read • Edit Online

This article helps you decide which Microsoft voice solution is right for your organization. After you've decided, the article provides a roadmap to content that will enable you to implement your chosen solution.

You might want the simplest solution—Phone System with Calling Plan. This is Microsoft's all-in-the-cloud solution that provides Private Branch Exchange (PBX) functionality and calls to the Public Switched Telephone Network (PSTN), as shown in the following diagram. With this solution, Microsoft is your PSTN carrier.



If you answer yes to the following, then Phone System with Calling Plan is the right solution for you:

- Calling Plan is available in your region.
- You do not need to retain your current PSTN carrier.
- You want to use Microsoft-managed access to the PSTN.

However, your situation might be more complex. For example, you might have offices in locations where Calling Plan isn't available. Or you might need a combination solution that supports a complex, multi-national deployment, with different requirements for different geographic locations. Microsoft supports a combination of solutions:

- Phone System with Calling Plan
- Phone System with your own PSTN carrier with Direct Routing
- A combination solution that uses both Phone System with Calling Plan and Phone System with Direct Routing

What do you need to read?

Required for all. Some of the sections in this article pertain to all organizations. For example, everyone should read about Phone System and understand the options for connecting to the Public Switched Telephone Network (PSTN).

REQUIRED FOR ALL	DESCRIPTION
Phone System	Microsoft's technology for enabling call control and Private Branch Exchange (PBX) capabilities in the Microsoft 365 cloud with Microsoft Teams.
Public Switched Telephone Network (PSTN) connectivity options	A choice between using Microsoft as your telephony carrier or connecting your own telephony carrier to Microsoft Teams by using Direct Routing. Combined with Phone System, PSTN connectivity options enable your users to make phone calls all over the world.

Depending on your requirements. Some of the sections in this article are pertinent depending on your existing deployment and requirements. For example, Location-Based Routing is only required for Direct Routing customers in geographic locations that do not allow toll bypass.

DEPENDING ON YOUR REQUIREMENTS	DESCRIPTION
Phone numbers from Microsoft	How to get and manage phone numbers from Microsoft, and how to transfer existing numbers to Microsoft. Read this if you need to obtain phone numbers for Microsoft Calling Plan, transfer existing numbers, obtain service numbers, and so on.
Dial plans and call routing	How to configure and manage dial plans that translate dialed phone numbers into an alternate format (typically E.164 format) for call authorization and call routing. Read this if you need to understand what dial plans are and whether you need to specify dial plans for your organization.
Emergency calling	How to manage and configure emergency calling—depending on your PSTN connectivity option. Read this section if you are using Microsoft Calling Plan or Direct Routing and need to understand how to manage emergency calling for your organization.
Location-Based Routing for Direct Routing	How to use Location-Based Routing (LBR) to restrict toll bypass for Microsoft Teams users based on their geographic location. Read this section if your organization is using Direct Routing at a location that does not allow toll bypass.
Network topology for cloud voice features	If your organization is deploying Location-Based Routing (LBR) for Direct Routing or dynamic emergency calling, you must configure network settings for use with these features in Microsoft Teams. Read this section if you are implementing LBR for Direct Routing, or if you are implementing dynamic emergency calling with Calling Plan or Direct Routing.
Migrate your existing voice solution	What you need to think about when migrating your voice solution to Teams. Read this section if you are migrating from an existing voice solution to Teams.

IMPORTANT

This article focuses on voice solutions with Microsoft Teams. While solutions with Skype for Business Online are still available (as described in Microsoft telephony solutions), it's important to understand that Skype for Business Online will be retired on July 31, 2021. After that date, the Skype for Business Online service will no longer be accessible. In addition, PSTN connectivity between your on-premises environment—whether through Skype for Business Server or Cloud Connector Edition—and Skype for Business Online will no longer be supported. This article introduces Teams voice solutions and how you can connect your on-premises telephony network, if necessary, to Teams by using Direct Routing.

Phone System

Phone System is Microsoft's technology for enabling call control and Private Branch Exchange (PBX) capabilities in the Microsoft 365 or Office 365 cloud with Microsoft Teams.

Phone System works with Teams or Skype for Business clients and certified devices. Phone System allows you to replace your existing PBX system with a set of features directly delivered from Microsoft 365 or Office 365.

Calls between users in your organization are handled internally within Phone System, and never go to the Public Switched Telephone Network (PSTN). This applies to calls between users in your organization located in different geographical areas, removing long-distance costs on these internal calls.

This article introduces the following Phone System key features and functionality, and the deployment decisions you'll need to consider:

- Auto attendants and call queues
- Cloud Voicemail
- Calling identity

For information about all Phone System features, and how to set up Phone System, see the following articles:

- Here's what you get with Phone System
- Set up Phone System in your organization
  Describes how to buy and assign Phone System licenses, manage phone numbers, and set up communication credits for toll-free numbers.

For information about managing supported devices, see Manage your devices in Microsoft Teams and Teams Marketplace.

Auto attendants and Call queues

Auto attendants allow you to set up menu options to route calls based on caller input. Call queues are waiting areas for callers. Used together, auto attendants and call queues can easily route callers to the appropriate person or department in your organization.

For information about auto attendants and call queues, see the following articles:

- Plan for Teams auto attendants and call queues
- Set up an auto attendant
- Create a call queue
- Contoso case study: Auto attendants and call queues
  Describes how a fictional multi-national corporation, Contoso, implemented auto attendants and call queues for their voice solution.

Cloud Voicemail

Cloud Voicemail, powered by Azure Voicemail services, supports voicemail deposits to Exchange mailboxes only. It doesn't support third-party email systems.

Cloud Voicemail includes voicemail transcription, which is enabled for all users in your organization by default. Your business needs might require that you disable voicemail transcription for specific users or everyone throughout the organization.

For online only users, Cloud Voicemail is automatically set up and provisioned for users after they are assigned a Phone System license. For Phone System users with an Exchange mailbox, you will need to perform extra configuration steps.

For more information about Cloud Voicemail and its configuration, see the following articles:

- Set up Cloud Voicemail
- Set voicemail policies in your organization

Calling identity

By default, all outbound calls use the assigned phone number as calling identity (caller ID). The recipient of the call can quickly identify the caller and decide whether to accept or reject the call. For information about configuring caller ID or to change or block the caller ID, see Set the caller ID for a user.

Public Switched Telephone Network connectivity options

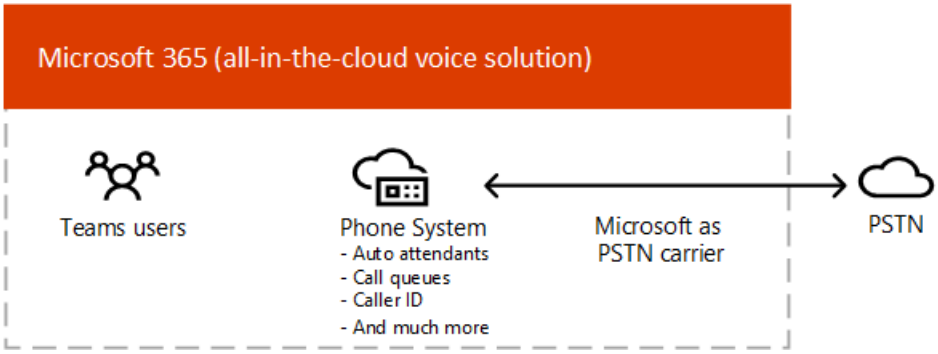
Phone System provides complete PBX capabilities for your organization. However, to enable users to make calls outside your organization, you need to connect Phone System to the Public Switched Telephone Network (PSTN). To connect Phone System to the PSTN, you can choose one of the following options:

- **Phone System with Calling Plan**. An all-in-the-cloud solution with Microsoft as your PSTN carrier.
- **Phone System with your own PSTN carrier** by using Direct Routing to connect your on-premises environment to Teams.

You can also choose a combination of options, which enables you to design a solution for a complex environment, or manage a multi-step migration (more about migration later).

Phone System with Calling Plan

As described earlier in this article, Phone System with Calling Plan is Microsoft's all-in-the-cloud voice solution for Teams users. This is the simplest option that connects Microsoft Phone System to the Public Switched Telephone Network (PSTN) to enable calls to landlines and mobile phones around the world. With this option, Microsoft provides Private Branch Exchange (PBX) functionality for your organization and acts as your PSTN carrier, as shown in the following diagram:



If you answer yes to the following, then Phone System with Calling Plan is the right solution for you:

- Calling Plan is available in your region.
- You do not need to retain your current PSTN carrier.
- You want to use Microsoft-managed access to the PSTN.

With this option:

- You get Microsoft Phone System with added Domestic or International Calling Plans that enable calling to phones around the world (depending on the level of service being licensed).
- You do not require deployment or maintenance of an on-premises deployment—because Calling Plan operates out of Microsoft 365 or Office 365.
- Note: If necessary, you can choose to connect a supported Session Border Controller (SBC) through Direct Routing for interoperability with third-party PBXs, analog devices, and other third-party telephony equipment supported by the SBC.

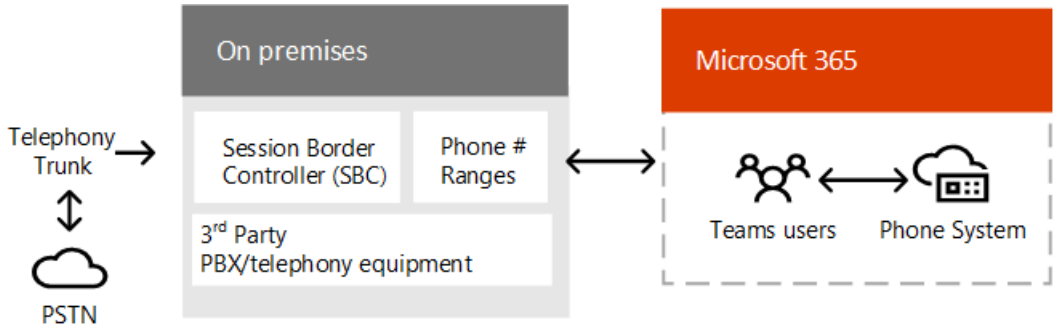
This option requires uninterrupted connection to Microsoft 365 or Office 365.

For more information about Calling Plan, see the following articles:

- Which Calling Plan is right for you?
- How to buy a Calling Plan
- Country and region availability for Calling Plan
- Set up Calling Plan

Phone System with own PSTN carrier with Direct Routing

This option connects Microsoft Phone System to your telephony network by using Direct Routing, as shown in the following diagram:



If you answer yes to the following questions, then Phone System with Direct Routing is the right solution for you:

- You want to use Teams with Phone System.
- You need to retain your current PSTN carrier.
- You want to mix routing, with some calls going through Calling Plan, some through your carrier.
- You need to interoperate with third-party PBXs and/or equipment such us overhead pagers, analog devices, and so on.

With this option:

- You connect your own supported SBC to Microsoft Phone System without the need for additional on-premises software.
- You can use virtually any telephony carrier with Microsoft Phone System.
- You can choose to configure and manage this option, or it can be configured and managed by your carrier or partner (ask if your carrier or partner provides this option).
- You can configure interoperability between your telephony equipment—such as a third-party PBX and analog devices—and Microsoft Phone System.

This option requires the following:

- Uninterrupted connection to Microsoft 365 or Office 365.
- Deploying and maintaining a supported SBC.
- A contract with a third-party carrier. (Unless deployed as an option to provide connection to third-party PBX, analog devices, or other telephony equipment for users who are on Phone System with Calling Plan.)

For more information about Direct Routing, see the following articles:

- Phone System Direct Routing
- Plan Direct Routing
- Configure Direct Routing
- Manage voice routing policies for use with Direct Routing
- Plan Location-Based Routing for Direct Routing
- List of Session Border Controllers certified for Direct Routing

Phone numbers from Microsoft

Microsoft has two types of telephone numbers available: *subscriber* (user) numbers, which can be assigned to users in your organization, and *service* numbers, available as toll and toll-free service numbers. Service numbers have higher concurrent call capacity than subscriber numbers and can be assigned to services such as Audio Conferencing, Auto Attendants, or Call Queues.

You will need to decide:

- Which user locations need new phone numbers from Microsoft?
- Which type of telephone number (subscriber or service) do I need?
- How do I port existing phone numbers to Teams?

For more information about managing phone numbers in your organization, including getting new numbers or transferring exiting numbers, see the following articles:

- Manage phone numbers for your organization
- Different kinds of phone numbers used for Calling Plan
- Getting phone numbers for your users
- Transfer phone numbers to Microsoft Teams

Dial plans and call routing

A dial plan is a set of normalization rules that translate dialed phone numbers into an alternate format (typically E.164 format) for call authorization and call routing.

You will need to decide the following:

- Does my organization need a customized dial plan?
- Which users require a customized dial plan?
- Which tenant dial plan should be assigned to each user?

For more information, see the following articles:

- What are dial plans?
- Plan for tenant dial plans
- Create and manage dial plans

Emergency calling

How you configure emergency calling differs depending on your PSTN connectivity option: Microsoft Calling Plan or Direct Routing. Dynamic emergency calling for Microsoft Calling Plan and Phone System Direct Routing provides the capability to configure and route emergency calls and notify security personnel based on the current location of the Teams client. For more information about emergency calling concepts and terminology, and how to configure dynamic emergency calling, see the following articles:

- Manage emergency calling
- Plan and configure dynamic emergency calling
- Contoso case study: Emergency calling
  Describes how a fictional multi-national corporation, Contoso, implemented emergency calling for their organization.

Location-Based Routing for Direct Routing

In some countries and regions, it's illegal to bypass the Public Switched Telephone Network (PSTN) provider to decrease long-distance calling costs. Location-Based Routing for Direct Routing enables you to restrict toll bypass for Microsoft Teams users based on their geographic location. For more information about how to plan

and configure Location-Based Routing (LBR), see the following articles:

- Plan Location-Based Routing for Direct Routing
- Configure network settings for Location-Based Routing
- Enable Location-Based Routing for Direct Routing
- Contoso case study: Location-Based Routing
  Describes how a fictional multi-national corporation, Contoso, implemented Location-Based Routing for their organization.

Network topology for voice features

If you are deploying dynamic emergency calling or Location-Based Routing for Direct Routing, you must configure network settings for use with these features in Microsoft Teams. To learn how to configure network settings for network regions, network sites, network subnets, and trusted IP addresses, see the following articles:

- Network settings for cloud voice features in Microsoft Teams - Concepts and terminology
- Manage your network topology for cloud voice features in Microsoft Teams

Migrate your existing voice solution to Teams

For an organization that is upgrading to Teams, the ultimate goal is to move all users to TeamsOnly mode. Using Phone System with Teams is only supported when the user is in TeamsOnly mode. If you need basic information about upgrading to Teams, start here:

- Getting started with your Microsoft Teams upgrade
- About the upgrade framework
- Upgrade from Skype for Business to Teams — for IT administrators

When migrating your voice solution, there are four possible calling scenarios when moving to TeamsOnly mode:

- **A user in Skype for Business Online, with a Microsoft Calling Plan**. Upon upgrade, this user will continue to have a Microsoft Calling Plan.
- **A user in Skype for Business Online, with on-premises voice functionality through Skype for Business on-premises or Cloud Connector Edition**. The user's upgrade to Teams needs to be coordinated with migration of the user to Direct Routing to ensure the TeamsOnly user has PSTN functionality.
- **A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and keeping on-premises PSTN connectivity**. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with migration of the user to Direct Routing.
- **A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and using a Microsoft Calling plan**. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with either A) the port of that user's phone number to a Microsoft Calling Plan or B) assigning a new subscriber number from available regions.

For more information about how to implement your voice migration for each of these scenarios—including information about when you need to set up hybrid connectivity and how to migrate users with on-premises voice functionality to Direct Routing—see the following articles:

- PSTN considerations when upgrading to Teams — for IT administrators

- Contoso voice migration case study
  The case study describes how a fictional multi-national corporation, Contoso, implemented a Teams voice solution for their organization. It contains the following articles:
  - Teams upgrade plan
  - Phone System and PSTN connectivity options
  - Location-Based Routing implementation
  - Emergency calling
  - Auto attendants and call queues
  - Audio Conferencing

Choose your upgrade journey from Skype for Business to Teams

12/5/2020 • 16 minutes to read • Edit Online



This article is part of the Project Definition stage of your upgrade journey. Before proceeding, confirm that you've completed the following activities:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams

As an existing Skype for Business customer, your complete transition to Teams might take some time. However, you can begin realizing the value of Teams today, by enabling your users to use Teams alongside Skype for Business. Given that there's some overlapping functionality between the two apps, we recommend that you review the available coexistence and upgrade modes to help determine which path is right for your organization. For example, you might opt to enable all workloads on both solutions without interoperability. Or, you might decide to manage the user experience, either by gradually introducing Teams capabilities or by targeting groups of users for select capabilities, until your organization is ready to upgrade everyone to Teams. Use the outcome of your pilot to help assess the right upgrade journey for your organization.

> **IMPORTANT**
> Skype for Business Online will be retired on July 31, 2021, after which it will no longer be accessible or supported. To maximize benefit realization and ensure your organization has proper time to implement your upgrade, we encourage you to begin your journey to Microsoft Teams today.

This article outlines the various modes that enable you to manage which modalities in Skype for Business and Teams are available to your users. As with any deployment, we strongly encourage you to pilot your intended plan with a selected group of users before upgrading your organization to Teams. Remember, introducing new technology can be disruptive for users. Take time to assess user readiness and implement a communication and training plan prior to implementing any of the modes outlined herein.

> **TIP**
> Join us for live, interactive workshops in which we'll share guidance, best practices, and resources designed to kick start upgrade planning and implementation.
>
> Join the Plan your upgrade session first to get started.

Upgrade journey building blocks

To formally prepare your organization for its journey to Teams, you need to start planning for the upgrade scenarios that will eventually let your organization fully embrace Teams as your sole communications and collaboration solution.

To help guide your decision-making process, familiarize yourself with the various modes, concepts, and terminology relevant to upgrading from Skype for Business to Teams. For more information, see Microsoft Teams and Skype for Business coexistence and interoperability.

> **NOTE**
>
> You will also need to consider your voice migration scenarios. Phone System is Microsoft's technology for enabling call control and Private Branch Exchange (PBX) capabilities in the Microsoft 365 or Office 365 cloud. To connect Phone System to the Public Switched Telephone Network (PSTN) so that users can make phone calls around the world, you have options based on your business need. For more information on Phone System and PSTN connectivity options, see Voice - Phone System and PSTN connectivity.

A user that has been migrated to Teams no longer uses a Skype for Business client except to join a meeting hosted in Skype for Business. All incoming chats and calls land in the user's Teams client, regardless of whether the sender uses Teams or Skype for Business. Any new meetings organized by the upgraded user will be scheduled as Teams meetings. If the user attempts to use the Skype for Business client, initiation of chats and calls is blocked[1]. However, the user can (and must) still use the Skype for Business client to join meetings they are invited to.

Administrators manage their transition to Teams using the concept of mode, which is a property of TeamsUpgradePolicy. A user that has been migrated to Teams as described above is in "TeamsOnly" mode. For an organization that is migrating to Teams, the ultimate goal is to move all users to TeamsOnly mode.

There are two methods for migrating an existing organization with Skype for Business (whether online or on-premises) to Teams:

- **Overlapping capabilities method** (using Islands mode): Users in an existing Skype for Business organization are introduced to Teams so that they can use both clients side by side during a transitional phase. During this period, most--but not all--functionality of Teams is available to them. The mode for this configuration is referred to as Islands, and this is the default mode for any existing organization with Skype for Business. Once the organization is ready, the administrator moves the users to TeamsOnly mode.
- **Select capabilities method** (using one or more of the Skype for Business modes): The administrator manages the transition (from Skype for Business to Teams) of chat, calling, and meeting scheduling functionality for users in their organization. Each of these functions is available either in Skype for Business or Teams, but not both. Administrators use TeamsUpgradePolicy to control when to shift this functionality to Teams for their users. Users who are not yet in TeamsOnly mode continue to use Skype for Business for chat and calling, and the two sets of users can communicate via interop functionality. Administrators manage the transition by progressively migrating more users into TeamsOnly mode.

[1] Older Skype for Business clients that shipped before 2017 do not honor TeamsUpgradePolicy. Make sure you are using the latest Skype for Business client available in your Office channel.

Below are the key factors to help decide the appropriate path for your organization.

Overlapping capabilities method (using Islands mode)

With the overlapping capabilities method, users can use both Teams and Skype for Business clients for chat, VoIP calling, and meetings. In this method, chat and VOIP calling in Teams is intra-organization focused, while Skype for Business enables chat and VOIP/PSTN calling with external organizations (if configured). Meetings can be scheduled and attended in both products.

When using the overlapping capabilities method, the communication traffic for Skype for Business and Teams remains separate (even for the same user) and the two different clients never communicate with each other (for

users within the same organization). User experiences are based on the recipient's configuration. For example, assume recipient User A is using this upgrade method:

- Communication initiated from another user's Skype for Business client will always land in User A's Skype for Business client.
- Communication initiated from the Teams client from a *user in the same organization* will always land in User A's Teams client.
- Communication initiated from Teams client from a *user in an external organization* will always land in User A's Skype for Business client.

If you have assigned a Microsoft 365 or Office 365 license to your users, this will be the default upgrade experience for your organization. When you assign a Microsoft 365 or Office 365 license, both Teams and Skype for Business Online licenses are assigned by default.[2]

For this method to work effectively, all users must run both clients simultaneously. Incoming chats and calls from within the organization to a user in Islands mode can land in either the Skype for Business or Teams client--and this is not under the control of the recipient. It depends on what client the sender uses to initiate the communication. If the sender and recipient are in different organizations, incoming calls and chats to a user in Islands mode always land in the Skype for Business client.

For example, if an Islands mode recipient is signed in to Skype for Business but not Teams, and someone messages them from Teams, the Islands mode recipient will not see the message (but they will eventually get an email saying they missed a message in Teams). Likewise, if a user is running Teams but not Skype for Business, and someone messages that user from Skype for Business, the user will not see that chat. The behavior in each of these cases is similar for calling. If users do not run both clients, it can easily lead to frustration.

Presence also functions independently between Teams and Skype for Business using this upgrade method. This means other users may see different presence states for User A, depending on which client they use. For more details, see Presence.

- Other users, when using Teams, will see presence based on User A's activity in Teams.
- Other users, when using Skype for Business, will see presence based on User A's activity in Skype for Business.

Once you are ready to upgrade users to TeamsOnly mode, you can upgrade users individually or you can upgrade the entire tenant at once using the tenant-wide policy[3]. Once a user is upgraded to TeamsOnly mode, they receive all incoming chats and calls in Teams.

However, non-upgraded recipients in Islands mode may continue to receive chats and calls from a TeamsOnly user in either their Skype for Business or Teams clients. For existing conversations the TeamsOnly user will reply to the client the sender initiated the chat or call from.

For new conversations from the TeamsOnly user's point of view, the chat or call will always go to the Islands mode users Teams client. This is because the Teams client maintains separate conversation threads for Teams-to-Teams and Teams-to-Skype for Business communication, even for the same user. To learn more, see Teams Conversations - Interop versus native threads.

The following table summarizes the Teams experience for both Islands mode and TeamsOnly mode:

TEAMS EXPERIENCE	IN ISLANDS MODE	IN TEAMSONLY MODE
Incoming chats and calls received in:	Teams or Skype for Business	Teams

TEAMS EXPERIENCE	IN ISLANDS MODE	IN TEAMSONLY MODE
PSTN calls received in:	Skype for Business (Using PSTN functionality in Teams is not supported in Islands mode.)	Teams
Presence	Presence in Skype for Business and Teams is independent. Users may see different states for the same Islands user, depending on which client they use.	Presence is based solely on the user's activity in Teams. All other users, regardless of which client they use, see that presence.
Meeting scheduling	Users can schedule meetings in either Teams or Skype for Business. By default, they will see both add-ins in Outlook. You can set a Teams meeting policy to control whether users can only use the Teams Meeting add-in or both the Teams Meeting and Skype for Business Meeting add-ins. To learn more, see set the meeting provider for users in Islands mode.	Users only schedule meetings in Teams. Only the Teams add-in is available in Outlook.

The following table summarizes the pros and cons of using the overlapping capabilities method to migrate your organization to Teams.

PROS	CONS
Allows for rapid adoption within an organization.	Potential for end user confusion because there are two clients with similar functionality, but different user interfaces. Also, they have no control over which client the incoming chats/calls land in.
Allows users to learn and get familiar with Teams while still having full access to Skype for Business.	Potential for end user dissatisfaction due to missed messages if the user is not running both clients.
Minimal administration effort to get started in Teams.	Can be challenging to "get out of Islands" mode and move to TeamsOnly mode if users and those they regularly communicate with are not actively using Teams.
Enables users to leverage capabilities to enhance teamwork that are not available in Skype for Business.	A user who is using Skype for Business on premises and Teams will not be able to communicate from Teams with another user who is using Skype for Business on premises but does not have Teams.

[2] This is true even if the user is homed on-premises in Skype for Business Server. Whether the user is homed on-premises or online, leave the Skype for Business Online license enabled, because it is currently needed for full Teams functionality.

[3] Note that migration of Skype for Business meetings to Teams meetings is only triggered when applying TeamsUpgradePolicy to individual users, not on a per tenant basis. See Meeting migration for details.

Select capabilities method (using Skype for Business modes)

Some organizations may prefer to provide their end users a more predictable experience as their organization transitions from Skype for Business to Teams. In this model, IT administrators use one of the Skype for Business modes in TeamsUpgradePolicy to explicitly designate which capabilities remain in Skype for Business prior to migrating to TeamsOnly mode. As they are ready to shift selected capabilities to TeamsOnly mode, the

administrator updates the mode for those users to TeamsOnly. During this transition:

- Administrators have options to enable certain Teams capabilities for users while keeping chat and calling capabilities in Skype for Business before users move to TeamsOnly experience. Administration can enable Teams collaboration capabilities or Teams meetings + collaboration capabilities.
- Users still on Skype for Business receive all incoming chats and calls in their Skype for Business client, regardless of whether the communication originated from the other user's Teams or Skype for Business client. In addition, for these Skype for Business users, calling and chat functionality in the Teams client are disabled to help prevent end user confusion and to ensure proper routing and presence.
- Users in TeamsOnly mode receive all incoming chats and calls in their Teams client and presence is provided by Teams, regardless of where the communication originated from: Teams, Skype for Business, or any kind of federated user.

Unlike the overlapping capabilities method, in the select capabilities method, users using Skype for Business can communicate with users who are in TeamsOnly. Communication between a Skype for Business user and Teams user is known as interoperability or "interop". Interop communication is possible on a one-to-one basis for chats and calls between a user in Skype for Business and another user in Teams. In addition, invited users can always join either a Skype for Business or Teams meeting, however, they must use a client that corresponds to the type of meeting. For more information, see Meetings.

For users in a select capabilities method, presence for a user is consistent regardless of which client is used by the other user. If the user is in one of the Skype for Business modes, all other users see presence based on that user's activity in Skype for Business. Similarly, if a user is in TeamsOnly mode, all other users see presence based on that user's activity in Teams. For details, see Presence.

For an organization that has chosen to follow the select capabilities method, the administrator should change the tenant-wide mode from Islands to the appropriate Skype for Business coexistence mode (SfbWithTeamsCollab or SfBWithTeamsCollabAndMeetings).

Guests user experiences will adhere to the coexistence mode assigned to the tenant. If you set a Skype for Business mode at the tenant level, guests can't chat, call, or show their presence. To learn more, read Guest access in Teams.

When the mode changes from Islands to SfbWithTeamsCollab, a user that has never used Teams will see no difference in how they use Skype for Business. However, should that user start to use Teams, they would only be exposed to functionality such as Teams & Channel and Files. Chat, calling and meeting scheduling would not be available in Teams, since the administrator has (for now) designated Skype for Business as the desired client for those functions.

> **NOTE**
>
> When User A changes from Islands to one of the Skype for Business modes, the Teams client of any other user that communicates with User A needs to know that User A's mode changed so it can route the communication to the appropriate client for User A. For any users who have already established native Teams-to-Teams chats with User A, it can take time for these other users' Teams clients to be aware of the mode change from Islands to any Skype for Business mode. When administrators are ready, they can shift chat, calling, and meeting scheduling for a given user to Teams all at once by updating the user's mode to TeamsOnly.

Alternatively, the administrator can first shift only meeting scheduling to Teams, while leaving chat and calling functions in Skype for Business using the SfBWithTeamsCollabAndMeetings mode. This mode allows organizations to transition to Teams for meetings—if users are not yet ready to move to TeamsOnly mode (for example, you are not yet ready to migrate existing PSTN functionality). This transitional scenario is referred to as Meetings First.

TEAMS EXPERIENCE	IN SFBWITHTEAMSCOLLAB MODE	IN SFBWITHTEAMSCOLLABANDMEETINGS MODE	IN TEAMSONLY MODE
Incoming chats and VOIP calls from users in your organization received in:	Skype for Business	Skype for Business	Teams
PSTN calls received in:	Skype for Business	Skype for Business	Teams
Presence	Skype for Business	Skype for Business	Teams
Meeting Scheduling	Skype for Business	Teams	Teams

The following table summarizes the pros and cons of using Skype for Business modes as a transitional step toward TeamsOnly mode.

PROS	CONS
Predictable routing for the end user. All calls and chats either land in Skype for Business or Teams (but not both), based on administrator selection.	Interop conversations lack support for rich text, file sharing, and screen sharing. This can be worked around leveraging Meet Now functionality to initiate a meeting.
May reduce end user confusion because a given functionality is only available in one client.	Users do not have access to Teams for common activities performed in Skype for Business such as chat and calling ahead of upgrading to TeamsOnly.
Administrator has increased control over the set of capabilities available to users while transitioning from Skype for Business to Teams.	
Allows an organization to use Teams for meetings, even if it is not yet ready to move entirely to TeamsOnly mode.	
Presence of a given user as viewed by others is the same, regardless of which client they use.	

Summary of upgrade methods

The following table summarizes the upgrade methods:

OVERLAPPING CAPABILITIES (USING ISLANDS MODE)	SELECTED CAPABILITIES (USING SKYPE FOR BUSINESS MODES)
Prior to being upgraded to TeamsOnly, users must run both clients simultaneously since incoming chats and calls may land in either client.	Chats and calls only land in one client, based on the recipient's mode. Non-upgraded users may run both clients, but there is no functional overlap (calling and chat are not available in Teams).
Allows administrators to introduce overlapping functionality (chat, meetings, VOIP calling) in both Skype for Business and Teams to end users as well as new capabilities (Teams and Channels) in Teams.	Allows administrators to introduce select functionality of Teams to end users (Teams and Channels), without providing same functionality that also exists in Skype for Business.
Interop between Skype for Business and Teams does not exist while both users are in Islands mode.	Interop is required for communication between Skype for Business and Teams users.

NOTE

If you are unable to follow supported methods for migrating your Skype for Business Server users to Teams, it would be possible to transition your users to Teams by removing Skype for Business Server and all related user attributes in Active Directory. Once the users Azure Active Directory attributes have been cleared of the Skype for Business Server attributes and DNS records have been re-pointed to Microsoft 365 or Office 365, it would then be possible to license the users in Microsoft 365 or Office 365 and upgrade them to Teams.

IMPORTANT

With the cutover migration, contact data and meetings data will not be migrated from on premises environment to Microsoft Teams.

 Decision point	Which upgrade journey is suitable to your organization's business requirements?
 Next step	Identifying your current deployment model, use case scenarios, and key considerations for your organization will inform the journey to Teams that's best suited to your organization.
 Decision point	Which upgrade scenario is applicable to your organization?
 Next steps	Decide the timeline of your organization's upgrade journey based on messaging, meetings, and calling business requirements. Decide the required additional work to complete your upgrade journey.

After you've chosen the best upgrade journey for your organization, perform your upgrade to Teams.

Conduct a user pilot

12/5/2020 • 6 minutes to read • Edit Online



This article is part of Deployment and Implementation stage of your upgrade journey, and shares insights for running an effective pilot. Before proceeding, confirm that you've completed the following activities:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey
- Prepared your environment
- Prepared your organization

By deploying new technologies, your organization can realize business value such as cost savings, security compliance, employee satisfaction, and operational efficiencies, but it can also affect your users' productivity and organizational infrastructure (your network). Before enabling new technology across your organization, conduct a formal user pilot. Just like you'd paint a small patch of color on a wall before painting the whole room, you'd test a broad rollout on a smaller scale by conducting a pilot to validate technical and user readiness, identify and mitigate issues, and help ensure a successful organization-wide implementation.

To achieve the most realistic results, the pilot should involve actual users, mimic how they communicate and collaborate, and verify both technical and user experiences. Whether your organization is considering running Skype for Business and Teams side by side, upgrading to Teams in the future, or deploying new functionality such a calling or conferencing, a pilot can help identify the right path forward for your organization. Sometimes considered Phase 1 of a rollout, the ideal pilot leverages the preparation you've already started and implements your defined plan with a targeted group of users.

Decision point	• How will you use a pilot to inform project direction?
Next step	• Use the guidance below to design and execute your formal pilot.

TIP

Use the sample pilot resources to help design your communications, test plan, and feedback survey.

1. Outline pilot logistics

A successful pilot has defined start and end dates, and clearly defined goals for measuring success. These goals should align with the scope of your broader project, as you documented when you defined your project scope, and will be used to inform your path forward after your pilot is over. You should also ensure that you've included the

right stakeholders for the duration of the project. You'll want to be sure to allow enough time to run the pilot and assess its impact: we recommend a minimum of 30 days.

Start small, and add to your pilot as appropriate—whether by adding workloads or features, or additional users—making time to assess results and adjust your pilot as you iterate. You might even opt to run subsequent pilots as new Teams features are released per the roadmap.

2. Select your pilot participants and test scenarios

One of the most important tasks of pilot planning is thoughtful participant selection. Remember that Teams is optimized for teamwork, so be sure to select pilot participants not solely based on roles or personas but also based on their project and cross-team work. A great place to start is asking your stakeholders and department managers for real projects that you can validate in Teams. An example of a role-based project might be to use Teams with your sales organization to ensure that field reps can easily access the resources they need and share insights with other field members. An example of project-based work might be coordinating a product launch event with the marketing, training, public relations, and event planning teams. Whichever scenarios you select, the pilot should extend to key people in IT, training, and your helpdesk, so you can thoroughly validate the solution while fully optimizing project management resources.

> **TIP**
> When selecting your Teams pilot group participants, be sure to include top users of Skype for Business. Check with those users to understand how they use Skype for Business today, then build out a test plan to verify that Teams can meet their current needs.

3. Design your test plan and feedback survey

For a successful pilot experience, give your participants clearly defined tasks to complete along with a way for them to share their feedback. Group tasks together to offer real-world scenarios to your users, demonstrating relevancy to their daily activities. Let the use cases you defined in Assess organizational change readiness guide your test plan.

Your organization might choose to pilot all functionality at once, or use a gradual approach—for example, pilot collaboration first, then meetings, then chat and calling. Ensure that you have an open feedback channel to track progress and measure outcomes. Use a predefined survey as an easy way to capture and assess pilot results; the survey design should be based on the scenarios and features in your test plan.

4. Create your communications plan

It's crucial to the success of your pilot that you educate pilot participants on what's happening, when, and why, and what's expected of them. To drive excitement and maximum participation, be sure to include user value messaging in addition to links to training and support where users can get additional information as they progress through the pilot. Here are a few sample resources to get you started with your pilot communications plan:

- Pilot resources, including email templates and sample feedback survey questions
- Switch to Teams from Skype for Business, a quick-start guide designed to help Skype for Business users get started with Teams

5. Conduct your pilot

With all the logistics in place, you're now ready to begin your pilot. Conducting your pilot includes communicating with your users, monitoring your network and usage to ensure your network performance and call quality remain healthy, gathering feedback from participants, and reviewing helpdesk tickets for questions related to Teams.

Tips for pilot success

The following tips can help ensure the success of your pilot:

- Before beginning your pilot, confirm that all pilot participants are enabled for the appropriate [coexistence mode]
- (https://aka.ms/SkypeToTeams-SetCoexistence) you want to validate.
- Weekly, throughout your pilot, meet with your project stakeholders to review user feedback, usage data, network data, and helpdesk tickets to ensure your pilot is running smoothly. Make any adjustments as needed.

Suggested timeline

Here's a suggested timeline for a 30-day pilot:

- One week before the pilot kickoff: Send initial communication to pilot users.
- Day 1: Send kickoff communication to pilot users.
- Day 7: Hold the first weekly project team checkpoint meeting.
- Day 14: Send mid-point communication to your pilot users, hold a weekly project team checkpoint meeting.
- Day 21: Hold a weekly project team checkpoint meeting.
- Day 30: Send final communication to your pilot users.
- Days 31–45: Assess pilot results, and plan for next steps.

6. Assess learnings and evaluate your go-forward plan

After your pilot is complete, it's time to gather all feedback surveys, final network stats, and support tickets for analysis against your goals and determine whether you'll implement your go-forward plan. You might find that your organization is ready for a broad deployment, or you want to extend your pilot to more users, or you want to revisit the pilot at a later date after any concerns you've identified have been mitigated. Remember that your pilot is a great way to predict technical and user outcomes in a *controlled* environment; be thoughtful about jumping ahead too quickly.

If your results indicate:

- **Your pilot goals (for example, user satisfaction and network quality) have been achieved**, you should be ready to proceed with the next phase of your rollout. Depending on the goals of your project, this could be one of the following:
  - Extending the pilot to additional participants
  - Enabling Teams alongside Skype for Business (**Islands** mode) for some or all of your organization
  - Upgrading users from Skype for Business to Teams (**Teams only** mode) for some or all of your organization
- **Your pilot didn't achieve the outcomes you wanted (for example, user satisfaction and network quality)**, take time to make the appropriate adjustments to your plan and revisit your pilot.

> **TIP**
> Enlist your pilot participants as peer champions to help evangelize and onboard new users to Teams. Peer champions can easily relate to other users, sharing their own experiences and learnings, and offering support and guidance to their colleagues. Learn more about champions and how you might use them within your own rollout.

Prepare your environment for upgrading to Teams

12/5/2020 • 2 minutes to read • Edit Online



This article is part of the Technical Readiness stage of your upgrade journey, an activity you complete in parallel with the User Readiness stage. Before proceeding, confirm that you've completed these activities from previous stages:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

To drive a successful Teams upgrade in your organization, it's important that you validate your current Skype for Business environment and your network readiness. Preparing your current environment will help ensure a high-quality user experience now, in addition to improving the quality of the user experience in Teams. Taking time to plan individual steps can help accelerate your deployment and ensure that you haven't skipped any important action items.

Complete these activities in parallel with your user readiness preparation:

- Prepare your IT staff to help ensure they have what they need for a successful upgrade journey.
- Verify that your environment meets all prerequisites, and understand dependencies among Microsoft 365 or Office 365 services and Teams.
- Evaluate your environment by performing environmental discovery by using a sample questionnaire to confirm your organization's readiness to undertake a successful upgrade journey to Teams.
- Prepare your network through planning, preparation, and taking any necessary remediation steps for your network to support Teams workloads.
- Prepare your service for rollout by using onboarding checklists to ensure that your Teams configuration is ready to support migrating your users from Skype for Business to Teams.

Prepare your IT staff for Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online



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- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

Your Microsoft 365 or Office 365 organization admins, technical leads, and support desk are accountable for driving a high-quality user experience. This includes ensuring that your network is ready to support Teams, configuring Teams for your users, and being able to effectively troubleshoot and resolve issues that might arise.

Share the following resources with your IT staff members, and confirm that they're ready to support users before you begin your upgrade to Teams:

- Admin training for Microsoft Teams
- Contact support for business products - Admin Help
- Troubleshoot connectivity issues with the Microsoft Teams client
- Use log files in troubleshooting Microsoft Teams

Decision points	• Have you involved all support staff who are likely to be involved in deploying and supporting Teams? • Have you developed a training plan for onboarding additional staff as your upgrade progresses?
Next steps	• Verify that IT staff has the information they need. • Revisit your training and preparation plans as new features are released.

After you've prepared your IT staff for Teams, verify that your environment meets all prerequisites.

Prerequisites and environmental dependencies for Teams

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- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

Teams combines multiple Microsoft 365 and Office 365 services, and is therefore dependent on the correct implementation and operation of these services. These services include—but aren't limited to—SharePoint Online, Exchange Online, and OneDrive for Business.

Although not all services are required, we highly recommend that you implement all of them. If you choose not to implement certain services, it will affect the functionality that Teams can offer your organization. For example, though you don't have to implement SharePoint Online, Teams does rely on SharePoint Online for certain functionality such as file sharing in group conversations, so not implementing this service will reduce the functionality offered through the client.

See the following articles to learn about prerequisites and how Teams interacts with other technologies:

- If your organization hasn't deployed any Microsoft 365 or Office 365 workloads, see Get started.
- If your organization hasn't added or configured a verified domain for Microsoft 365 or Office 365, see Domains FAQ.
- If your organization hasn't synchronized identities to Azure Active Directory, see Identity models and authentication in Microsoft Teams.
- If your organization doesn't have Exchange Online, see Understand how Exchange and Microsoft Teams interact.
- If your organization doesn't have SharePoint Online, see Understand how SharePoint Online and OneDrive for Business interact with Microsoft Teams.
- To learn how Microsoft 365 groups and Microsoft Teams interact.
- If your organization is an educational institution and you use a Student Information System, see Welcome to Microsoft School Data Sync before deploying Microsoft Teams.
- If your organization is considering Public Switched Telephone Network (PSTN) calling options, see Voice - Phone System and PSTN connectivity, Which Calling Plan is right for you, and Phone System Direct Routing.
- To ensure all network requirements have been met before rolling out Teams, see Prepare your

organization's network for Microsoft Teams.

After you've verified that your environment meets all applicable prerequisites, evaluate your current environment for Teams.

Evaluate your environment before upgrading to Teams

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- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

This article gives an overview of the requirements for properly evaluating your current environment for operating Teams. By evaluating your environment, you identify risks and requirements that will influence your overall deployment. By identifying these items beforehand, you can adjust your planning to drive success.

Introduction to the Discovery Questionnaire

To achieve your objective key results (OKRs), you previously made key service decisions. The next step is to perform environmental discovery to evaluate all aspects relating to your IT infrastructure, networking, and operations to confirm that your organization is ready to implement the solution. Discovery is one of the very first, key steps that you take when planning for your journey to Teams. Environmental discovery must include a network readiness assessment to ensure your network can support upgrading to Teams. You perform a detailed discovery of your environment to better understand its current state and to reveal any difficulties or—even more important—possible blockers to the execution of your Teams rollout.

You identify technical risks as part of an environmental assessment and adoption readiness evaluation, and develop a mitigation plan for each identified risk. You should incorporate this information in the risk register.

All matters related to your existing collaboration infrastructure and Microsoft 365 or Office 365 organization, networking, endpoints, operations, and adoption and readiness are included as part of the environmental discovery questionnaire. Work with your project team to provide the requested information with as much detail as possible to facilitate your planning activities.

The questionnaire is divided into the following sections to confirm your organization's readiness for your Teams deployment in several major areas:

- Microsoft 365 or Office 365 organization details
- Existing collaboration platform summary
- Collaboration platform deployment details
- Networking and access to Microsoft 365 or Office 365 services
- Endpoints
- Operations
- Adoption and readiness

> **TIP**
>
> You can start by copying the questionnaire into a Microsoft Word document. Try to answer all questions and capture all details as you move through.

 Decision point	• Who will be responsible for completing an environment assessment?
 Next step	• Document the results of the environment assessment.

Project team

Ensure that you've engaged the right people for your project team. Verify the steps you completed in Enlist your project stakeholders.

After you evaluate your environment, proceed to the next step: Prepare your service.

Prepare your service for upgrading to Teams

12/5/2020 • 2 minutes to read • Edit Online



This article is part of the Technical Readiness stage of your upgrade journey, an activity you complete in parallel with the User Readiness stage. Before proceeding, confirm that you've completed these activities from previous stages:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

This article gives an overview of the requirements for preparing your organization for collaboration and cloud voice services with Teams. By preparing properly, you can be sure you're ready to provide these capabilities to your organization.

Onboarding checklists and landing pages for Microsoft Teams rollout

The following checklists and landing pages walk you through the steps for deploying Microsoft Teams in your organization:

- Prepare Microsoft 365 or Office 365 for Teams
- Configure Teams core capabilities
- Prepare your network
- Chat, teams, channels, and apps
- Meetings and audio conferencing
- Phone System and PSTN connectivity options

The tasks and activities in these checklists are the core "to-do" items that apply to every deployment of collaboration and voice capabilities with Teams. You can customize the checklists to include the activities and tasks that are specific to your own Teams journey.

Use the provided checklists to track the status of each individual activity and task, and to be sure you haven't skipped any critical steps. Each activity includes a detailed description of required actions and references to additional information that you can use to complete that activity.

Although we recommend that you follow the checklists in order, the exact sequence will depend on the scope of your deployment and the configuration and complexity of your environment. They're organized to support either a "greenfield" Teams deployment (one with no previous Skype for Business Online presence) or upgrading from Skype for Business Online to Teams. If you're upgrading from Skype for Business Online, you might have already completed some of these activities and can ignore them now.

When you're onboarding users on a per-site basis, we highly recommended that you use the Site Enablement Playbook for Voice (Playbook) as a supplementary guide to these checklists.

NOTE

Most of the configuration settings are common between Teams and Skype for Business Online. You use the Microsoft Teams admin center to configure those settings.

 Decision point	• Who will be responsible for overseeing the completion of the onboarding checklists?
 Next steps	• Download the onboarding checklists. • Work through the onboarding checklist items step-by-step in accordance with your organization's deployment plan.

Continue onboarding

After you complete this checklist, proceed to the next step: Conduct a user pilot

Prepare your organization

12/5/2020 • 2 minutes to read • Edit Online



This article is part of the User Readiness stage of your upgrade journey, an activity you complete in parallel with the Technical Readiness stage. Before proceeding, confirm that you've completed these activities from previous stages:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

To realize maximum value from Teams, users must actually use it, but getting users to change the way they work isn't always easy. Taking time to understand your users and design the right readiness plan can help facilitate change and accelerate adoption of Teams. These activities should be completed in parallel with your technical readiness preparation:

- Assessing organizational change readiness: This includes understanding who your users are, how they'll use the new technology, and how readily they adapt to change. This is also an opportunity to identify specific user profiles who would benefit from focused onboarding.
- Preparing a user readiness plan: Consisting of awareness, training, and support activities, your readiness plan should address both your broad user base and targeted profiles, as identified in the assessing change readiness article.

TIP

Download the Upgrade Success Kit for template user readiness materials, such as communications and user surveys, in addition to a sample upgrade project plan and pilot test plan.

Assess organizational change readiness

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This article is part of the User Readiness stage of your upgrade journey, an activity you complete in parallel with the Technical Readiness stage. Before proceeding, confirm that you've completed these activities from previous stages:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

After you've secured your project team and defined your vision, scope, and goals, the next step on your upgrade journey is to ensure that your organization and users are ready for Teams—an activity that you complete in parallel with ensuring your technical readiness. To realize value from Teams, users must actually use it. Simply enabling Teams doesn't guarantee that you achieve your goal. Users have different use cases and varying learning styles, and they adapt to new technology at different speeds. The good news is that managing change isn't all that complicated, but it does take a focused effort. The guided discussions below are designed to help you understand your user base so that you can prepare the right level of education to facilitate and accelerate user adoption. There are two ways you should look at your user base:

- **Organizational change readiness**: Understanding how quickly (or not) users typically react to change. This information will help inform the amount of awareness, training, and value-selling you might need to do to drive user adoption.
- **Teamwork scenarios**: Understanding how users work will enable you to map Teams to their work activities, accelerating adoption and facilitating the shift away from Skype for Business.

> **NOTE**
> You can adapt the assessment activities given below to any change initiative in your organization. Simply address the questions based on the scope of your project. In the following discussions, "new solution" can apply to audio calling, audio conferencing, or your upgrade from Skype for Business to Teams.

Decision points	• What is the culture of your organization when it comes to change? • How can the new technology optimize the way users work? • Which users are likely to require special attention to get them to change the way they work?
Next steps	• Use the following guidance and associated activities to capture your organization's user readiness profile.

Organizational change readiness

By assessing your organization's readiness, you can determine how receptive (or not) your users are likely to be to changing the way they work and adopting new technology. Understanding how users react to change empowers your organization to proactively address concerns, adjust your rollout plan to get optimal buy-in, and identify users who can actually help you facilitate the change with their peers.

Activity

Use the following conversation starters to conduct an organizational readiness assessment and document the culture of your organization when it comes to change. This information can help inform how much awareness and training you might need to implement for your project. Don't worry about exact numbers. This exercise represents a general understanding of your organizational culture. If you need help getting started, simply evaluate a past rollout; this can help you anticipate how users might react to change and help you proactively address the reactions you expect.

What percentage of users fall into each bucket?

EARLY ADOPTERS	INFORMED USERS	LAGGARDS
These users request the solution before it's available.	These users accept the solution as soon as its value is demonstrated.	These users reject the solution, even when pushed into change.

> **TIP**
> Enlist your early adopters for your pilot testing in addition to serving as peer champions. Champions help evangelize new technology and lead by example to show their peers how to realize value. To learn more about creating a formal champions program, see the Office adoption guide. Your laggards might need more convincing before they adopt a new technology. If more than 20 percent of your organization falls into this bucket, spend more time communicating the value messaging and delivering tailored training. In addition, support them through the change by opening a feedback loop to better understand and address their hesitations.

What percentage of users fall into each competency?

SELF-MOTIVATED	TEAM PLAYERS	HAND-HOLDING SEEKERS
These learners seek out resources, learn by doing.	These users enjoy group and interactive training; they'll go along with coworkers.	These users expect "white glove" or one-on-one assistance.

> **TIP**
> Not everyone learns the same way. For those who are self-motivated, point to Microsoft's online videos and training articles. If 20 percent or more are team players, enlist your training team or a partner to deliver live, interactive training (in person or online). Typically, you'll find executives or targeted roles in the hand-holding category. This is a critical group who would benefit from personalized, short training sessions. Enlist your champions to help deliver training to these users, for an optimal experience.

Assessing teamwork scenarios

Microsoft Teams expands the capabilities of Skype for Business, offering a comprehensive communication and collaboration solution. As you design your plan for upgrading users from Skype for Business to Teams, consider how you can use the power of teamwork collaboration to both excite users and facilitate their transition from Skype for Business to Teams.

At its core, teamwork is how people work together to get things done. It's about aligning the right people with the

relevant tools in a way that works for them. Teams brings people, conversations, files, and projects together into one workspace, creating a true hub for teamwork in your organization.

Understanding how user work and how they come together can help users visualize how they can use Teams, facilitating the shift away from Skype for Business. There are two core ways to think about teamwork scenarios: people-centric and project-centric.

- **Project-centric teamwork** centers on a specific project or initiative (for example, planning a product launch event). From scope planning to budget management to marketing efforts, project-centric teamwork helps align project workstreams, keeping everyone informed.
- **People-centric teamwork** revolves around people with similar responsibilities or attributes who might work on the same team (for example, the sales team, road warriors) or across teams (for example, peer champions). From chatting with a colleague to get an answer to a question to participating in a team meeting, people-centric activities include information sharing and rapport building.

To get the most out of Teams, build a teamwork strategy that includes both scenarios, helping users understand how Teams can work for them.

 Decision point	• What relatable teamwork scenarios will you employ to help accelerate user adoption of Teams and facilitate your upgrade from Skype for Business?
 Next steps	• Use the samples below to help craft your own teamwork scenarios. Document them in the Upgrade Workbook. • For additional scenarios and examples, go to the Productivity Library

Examples

Project-centric teamwork: Product launch event (for example: your organization is getting ready to launch a new product to the market and is planning a broad promotional event to drive awareness, generate leads, and encourage sales).

CONSIDERATION	NOTES
Core attributes	• Cross-team stakeholders with various project workstreams • Frequent targeted meetings • Lots of pieces/people coming together (budget, schedules, presentations, registration, and so on)
Teamwork challenges today	• Workstreams are working in silos with limited visibility into overall project status or cross-team efforts: ◦ Disconnected conversations and lack of "who's doing what" ◦ Information tracked in various places with no cross-team visibility • Lost productivity time when bringing a new member on board or catching up from missing a meeting

CONSIDERATION	NOTES
Teamwork requirements	• Quick access to project schedule and task assignment • Open conversation channel to keep everyone in-the-know • Central location for current presentation files and other resources • Ability to bring new project team members up-to-speed quickly • Way to encourage and support one another to keep momentum
Teamwork in Teams	• Team/channels to organize project content and threaded conversations • SharePoint for hosting PPT files[1] • Planner/Trello for assigning individual project tasks and due dates[1] • Teams for online meetings • Teams mobile app for connecting on the go

[1] Supporting app integration or alignment in Teams.

People-centric teamwork: Sales team (for example: your regionally-dispersed sales team needs to stay connected from the road, remain aligned on the pipeline, and understand key offers and initiatives that can help drive toward annual quota targets)

CONSIDERATION	NOTES
Core attributes	• Work remotely (on the road, hotels, customer sites) • Relationship-focused – core external
Teamwork challenges today	• Repeated conversations with multiple field reps (chat, calls, meetings, etc) – can't get everyone together at once • Missed opportunities to learn from sales "wins" – word of mouth sharing only • Continually shuffling between applications: ◦ Sales Pipeline in Excel ◦ Trending in Power BI ◦ Sales collateral in email ◦ Customer demo resources on SharePoint ◦ 1:1 chats and point-in-time meetings ◦ Sales community outreach in Yammer
Teamwork requirements	• Quick access to sales collateral • Reach an expert quickly • Fast turn-around for questions and approvals • Sales meetings, pipeline reviews • Sales training resources • Customer database management

CONSIDERATION	NOTES
Teamwork in Teams	• Teams/channels by region or customer designed to focus content and conversations • SharePoint for collateral/resources[1] • XLS/Power BI for pipeline and databases[1] • Teams for online meetings • Teams mobile app for connecting on the go • Teams app integration with CRM system[1] • Yammer for broad-reach SME insights and information sharing*[1]

[1] Supporting app integration or alignment in Teams.

Tips for identifying a "good fit" for your teamwork strategy

It could be easy to get carried away forming a teamwork strategy for every user, every team, and every project. Not every project or team requires a fully defined teamwork strategy. Here are some best practices for getting started:

- Consider cross-team projects that are just starting out or are upcoming.
    - Event planning – coordination from multiple teams (budget, logistics, presentations, and so on)
    - Pilot new product - share information, gather feedback in a controlled environment
- Identify user personas and core work groups, connecting the various ways they interact with one another into Teams
    - Sales teams/regions – road warriors, easy access resources, quick turn-around responses
    - HR – standardized processes across all divisions, consistent approach for hiring
    - Firstline workers – connection to their peers/management, access to procedures, NEO
- Keep these considerations in mind:
    - Start small. Save bigger, more complex projects for after you've vetted the teamwork model.
    - Focus on new projects. Avoid changing an existing project that's well underway as this may disrupt workflow.
    - Consider timing. Rolling out a new teamwork strategy to sales at the end of your fiscal year may not be ideal.
    - Iterate. No need to reinvent the wheel. When you find a teamwork structure that works, repeat it with other workgroups and projects. Define a template team and set guidelines to help users quickly assimilate into Teams and provide consistency.

Use the information you've gathered above to inform your user readiness plan.

Prepare a user readiness plan

12/5/2020 • 2 minutes to read • Edit Online



This article is part of the User Readiness stage of your upgrade journey, an activity you complete in parallel with the Technical Readiness stage. Before proceeding, confirm that you've completed these activities from previous stages:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey

An optimal user readiness plan incorporates how you'll communicate with, train, and support your users as you pilot, onboard, and upgrade to Teams. As you discovered in Assess organizational change readiness, readiness is not one-size-fits-all. To ensure optimal receptiveness to the new technology, use a combination of broad-reach messaging (incorporating the vision/value messaging and universal use cases) and messaging, training, and support tailored to the personas and cohorts you've defined and also to your laggards, as appropriate. This personalized plan will help facilitate user adoption by enabling users to more quickly relate to Teams, while demonstrating that you understand their needs.

TIP

Download the Upgrade Success Kit for template user readiness materials, such as communications and user surveys, in addition to a sample upgrade project plan and pilot test plan.

Decision points	• How can you create a readiness plan to facilitate and accelerate user adoption of the new solution? • Do you have the right awareness, training, and support resources that align with your users' ability to deal with change and the user personas you've defined?
Next step	• Use the list below to generate ideas for your readiness plan. Select the most relevant activities—or add your own—to design a readiness plan optimized for your organization. Remember to use a combination of broad-reach (for your whole organization) and targeted (for laggards or specific personas) campaigns for maximum results.

WHAT COMMUNICATION CHANNELS WILL YOU LEVERAGE?	WHAT TRAINING CHANNELS WILL YOU LEVERAGE?	WHAT SUPPORT CHANNELS WILL YOU USE?

• Email **Tip:** Use our sample pilot, coexistence, and upgrade emails to customize your email campaign. • Posters and digital signage • Launch events • Department managers • Champions • Teams/channels • Gamification	• Microsoft instructor-led training • Microsoft-published online articles and videos • Resources: ◦ Switch to Teams from Skype for Business ◦ Teams Video Training • In-product assistance (Help) • In-house training team • Partner training team	• In-house helpdesk • Outsourced support desk • Self-service (intranet site) • Online help and how-to • Floor-walkers and champions • Feedback loop (surveys, ratings)

After you've created your user readiness plan and associated resources, and your technical readiness is in place, proceed to pilot Teams in your organization.

Overview of implementing your upgrade

12/5/2020 • 2 minutes to read • Edit Online



This article is part of the Deployment and Implementation stage of your upgrade journey.

Prerequisite planning activities

> **IMPORTANT**
> Before proceeding with your upgrade implementation, confirm that you've read the planning content starting with Plan your upgrade to ensure you've completed all prerequisite planning activites.

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey
- Planned a user pilot
- Prepared your environment
- Prepared your organization

Choose your upgrade starting point

The steps you take to perform your upgrade to Teams depends on your current deployment of Skype for Business:

Based on your current environment, choose your starting point:

- **If you are upgrading from Skype for Business Online to Teams**, follow the steps in Upgrade from Skype for Business Online to Teams.
- **If you are upgrading from a Skype for Business on-premises environment**, you'll need to perform some extra steps to set up connectivity between your on-premises and online environments before you move your users to Teams. For more information, see Upgrade Skype for Business on-premises to Teams.

> **IMPORTANT**
> Having the option to upgrade doesn't necessarily mean your organization is ready for this change. For the best user experience, confirm that Teams meets your collaboration and communication requirements, make sure that your network is ready to support Teams, and implement your user readiness plan before upgrading users to Teams.

Upgrade from Skype for Business Online to Teams

12/5/2020 • 4 minutes to read • Edit Online



This article is part of Deployment and Implementation stage of your upgrade journey. Before proceeding, confirm that you've completed the following activities:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey
- Prepared your environment
- Prepared your organization
- Conducted a pilot

Follow the guidance in this article if you have wholly deployed Skype for Business Online and want to upgrade your users from Skype for Business to Teams. You can upgrade users selectively or all-in, based on the upgrade journey that your organization has chosen, by assigning the appropriate coexistence and upgrade mode to your users.

> **IMPORTANT**
> Skype for Business Online will be retired on July 31, 2021, after which it will no longer be accessible or supported. To maximize benefit realization and ensure your organization has proper time to implement your upgrade, we encourage you to begin your journey to Microsoft Teams today. Remember that a successful upgrade aligns technical and user readiness, so be sure to leverage the guidance herein as you navigate your journey to Microsoft Teams.

Assign the coexistence and upgrade mode

You can upgrade your users to TeamsOnly mode by assigning the UpgradeToTeams instance of TeamsUpgradePolicy, which can be performed by using the Microsoft Teams admin center or a Skype for Business remote Windows PowerShell session. You can do this either on a per user basis, or on a tenant-wide basis if you want to upgrade the entire tenant in one step.

For more information, see Setting your coexistence and upgrade settings and TeamsUpgradePolicy: managing migration and coexistence.

Upgrade all users to Teams at one time

Follow these steps to upgrade all of your users to Teams at one time.

Step 1: Notify the users of the change (optional)

1. In the Microsoft Teams admin center, select **Org-wide settings** > **Teams upgrade**.
2. Under **Coexistence mode**, change the **Notify Skype for Business users that an upgrade to Teams is available** switch to **On**.

Step 2: Set the coexistence mode to TeamsOnly for the organization

1. In the Microsoft Teams admin center, select **Org-wide settings**.
2. Select **Teams Only** mode from the **Coexistence mode** drop-down list.

Upgrade users in stages

Follow these steps if you want to gradually upgrade your users to TeamsOnly.

Step 1: Identify groups of users for upgrade

Often organizations may choose to upgrade their organizations in success waves of users. You'll want to identify these users first so you can easily search for them in the Microsoft Teams admin center. Alternatively, you may want to use PowerShell to more efficiently do this. Once you have identified the set of users for a given upgrade wave, continue with the remaining steps.

Step 2: Set notification for the users in the current upgrade wave (optional)

If using the Microsoft Teams admin center, you can configure TeamsUpgradePolicy for up to 20 user at once:

1. In the Microsoft Teams admin center, select **Users**, and find and multi-select the checkbox for up to 20 users who should be upgraded.
2. Select **Edit settings** in the upper left corner of the listview.
3. In the **Edit settings** pane on the right, under **Teams upgrade**, change **Notify the Skype for Business user** switch to **On**. Note: If the value of coexistence mode is "Use Org-wide settings", you won't see this switch, so you'll need to first explicitly set the Coexistence mode for these users to whatever the default value is for the org.

Alternatively, you may find it easier to enable notifications for groups of users at once using PowerShell.

Step 3: Set the coexistence mode for users to Teams Only

When you are ready to upgrade the users in the current wave to use Teams as their only application, set the Coexistence mode for the users to Teams Only.

If using the Microsoft Teams admin center, you can configure TeamsUpgradePolicy for up to 20 user at once:

1. In the Microsoft Teams admin center, select **Users**, and then select the checkbox for up to 20 users.
2. Select **Edit settings** in the upper left corner of the listview.
3. In the **Edit settings** pane on the right, under **Teams upgrade** section, set the coexistence mode to **Teams Only** in the drop-down list.

Alternatively, you may find it easier to upgrade groups of users at once using PowerShell.

Step 4: Repeat steps 1-3 for successive waves of users

As you validate your upgrade to Teams Only mode and are ready to expand, repeat the previous steps to apply TeamsOnly to more users.

Phone System and PSTN connectivity options

Phone System with Teams is supported after the user is in TeamsOnly mode. (If the user is in Islands mode, Phone System is only supported with Skype for Business.)

PSTN connectivity options

When considering Public Switched Telephone Network (PSTN) connectivity options, there are two possible scenarios when moving from Skype for Business Online to TeamsOnly mode:

- A user in Skype for Business Online, with a Microsoft Calling Plan. Upon upgrade, this user will continue to have a Microsoft Calling plan. This is the simplest scenario requiring only a couple of steps. For more

information, see From Skype for Business Online with Microsoft Calling Plans.

- A user in Skype for Business Online, with on-premises voice functionality through Skype for Business on-premises or Cloud Connector Edition. The user's upgrade to Teams needs to be coordinated with migration of the user to Direct Routing to ensure the TeamsOnly user has PSTN functionality. For more information see, From Skype for Business Online with on-premises voice.

Upgrade from Skype for Business on-premises to Teams

12/5/2020 • 4 minutes to read • Edit Online



This article is part of Deployment and Implementation stage of your upgrade journey. Before proceeding, confirm that you've completed the following activities:

- Enlisted your project stakeholders
- Defined your project scope
- Understood coexistence and interoperability of Skype for Business and Teams
- Chosen your upgrade journey
- Prepared your environment
- Prepared your organization
- Conducted a pilot

If you've deployed Skype for Business Server or Microsoft Lync on-premises and your organization wants to upgrade to Teams, follow the guidance in this article. You need to set up hybrid connectivity with your Microsoft 365 or Office 365 organization, and determine coexistence requirements if you are moving your users to Teams in phases.

> **IMPORTANT**
> Skype for Business Online will be retired on July 31, 2021, after which it will no longer be accessible or supported. To maximize benefit realization and ensure your organization has proper time to implement your upgrade, we encourage you to begin your journey to Microsoft Teams today. Remember that a successful upgrade aligns technical and user readiness, so be sure to leverage the guidance herein as you navigate your journey to Microsoft Teams.

Step 1: Configure hybrid connectivity

The key prerequisite for upgrading your on-premises users to Teams is to configure hybrid connectivity for your Skype for Business Server on-premises deployment.

Start by readingPlan hybrid connectivity and then follow the tasks outlined in Configure hybrid connectivity.

Step 2: Set transitional coexistence mode (optional)

Coexistence and interoperability between Skype for Business and Teams clients and users are defined by Teams Upgrade modes. By default, organizations are in Islands mode, which allows users to use both Teams and Skype for Business clients side by side.

For an organization moving to Teams, TeamsOnly mode is the final destination for each user--though not all users need to be assigned TeamsOnly (or any other mode) at the same time.

Prior to users reaching TeamsOnly mode, organizations can optionally use any of the Skype for Business coexistence modes to ensure predictable communication between users who are in TeamsOnly mode and users

who aren't yet. The purpose of the Skype for Business coexistence modes (SfBOnly, SfBWithTeamsCollab, SfBWithTeamsCollabAndMeetings) is to provide a simple, predictable experience for end users as organizations transition from Skype for Business to Teams.

When a user is in any of the Skype for Business modes, all incoming chats and calls are routed to the user's Skype for Business client. To avoid end-user confusion and ensure proper routing, calling and chat functionality in the Teams client is disabled when a user is in any of the Skype for Business modes. Similarly, meeting scheduling in Teams is explicitly disabled when users are in the SfBOnly or SfBWithTeamsCollab modes, and explicitly enabled when a user is in the SfBWithTeamsCollabAndMeetings mode.

Depending on your requirements, you can assign the appropriate coexistence mode based on the upgrade path that your organization has chosen. For more information, see Migration and interoperability guidance for organizations using Teams together with Skype for Business and Setting your coexistence and upgrade settings.

Step 3: Move users from Skype for Business on-premises to Teams Only

Ultimately, you'll want to move your users to TeamsOnly mode. This might involve one or two steps depending on your on-premises environment.

For more information, seeMove users between on-premises and the cloud and Move users from on-premises to Teams.

Step 4: Disable hybrid to complete your migration to the cloud

After you have moved all users from on-premises to the cloud, you can decommission the on-premises Skype for Business deployment. For more information, see Disable hybrid to complete migration to the cloud.

Phone System and PSTN connectivity options

Phone System with Teams is supported after the user is in TeamsOnly mode. (If the user is in Islands mode, Phone System is only supported with Skype for Business.)

PSTN connectivity options

When considering Public Switched Telephone Network (PSTN) connectivity options, there are two possible scenarios when moving from Skype for Business on premises to TeamsOnly mode:

- A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and using a Microsoft Calling plan. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with either A) the port of that user's phone number to a Microsoft Calling Plan or B) assigning a new subscriber number from available regions. For more information, see From Skype for Business Server on-premises, with Enterprise Voice, to Microsoft Calling Plan.
- A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and keeping on-premises PSTN connectivity. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with migration of the user to Direct Routing. For more information, see From Skype for Business Server on-premises, with Enterprise Voice, to Direct Routing.

How to use Microsoft Teams effectively

12/5/2020 • 2 minutes to read • Edit Online



This article is part of the Operational Excellence stage of your upgrade journey, which begins as soon as you've completed your upgrade from Skype for Business to Teams.

Technology is innovating at an unprecedented pace. Staying current and enabling a modern workplace environment has become a standard in how organizations operate. As Microsoft Teams, Microsoft 365, and Microsoft's intelligent communication vision continue to unfold, having an operational plan in place will help ensure your organization is set up for long-term success. An optimal operational plan includes monitoring your environment for health and quality, continuing user momentum to optimize adoption, and planning for new functionality that will continue to come online over time.

Monitor for network health and quality

The status of your network affects the user experience. When a user has a poor experience (for example, call drops or lag time when joining meetings), they correlate this to the technology itself, leaving them with the impression that the technology doesn't work and opening the door for unsupported apps. Implementing a plan to monitor and mitigate network health will help ensure a positive user experience in addition to reducing calls to your support desk. For more information, see:

- Operate your service
- Monitor and improve call quality
- Enhance your service

Drive user momentum and adoption

To realize maximum benefit and business outcomes with Teams, users must actually use it. However, initial excitement tends to wane and users easily revert to old ways of working. Encourage user adoption and maintain excitement for Teams with an ongoing adoption plan, which can include:

- Enlisting peer champions to help evangelize and encourage fellow users.
- Checking the Microsoft 365 Adoption Guide for tips on boosting engagement and driving adoption.
- Leveraging the Teams Customer Success Kit to enhance awareness and share best practices.
- Implementing a formal adoption and change management strategy to help sustain adoption growth.

Prepare for new functionality

The lifecycle of any given technology has shifted to a dynamic growth cycle. This means that the Teams and Microsoft 365 roadmaps will continue to unfold, with new functionality lighting up on a regular cadence. Establishing a change cycle within your organization will ensure you're ready to manage continual collaboration improvements and realize maximum value. This can include:

- Monitor the Teams roadmap.
- Implement a change planning form (as illustrated below) to prepare and implement new functionality. Be sure to include both technical and user readiness activities.

	Release		Notes	Next Step	Owner
General	Expected release date	1/2/2018			
	Functionality	**Recording**			Project Team
	Business Requirement for SFB to Teams?	Yes for select business units	Blocker for training team		Project Team
	Legal review?	Approved	Legal has signed off for training team only		Project Team
Technical CM	Technical impact /IT changes req'd?	Med	Admin needs to enable recording for identied users only		Project Team
	Technical Readiness	Yes	John is on point		Project Team
User CM	User Impact	High	Training team needs to know recording is available, get trained and transition from SFB recordings		Project Team
	User readiness required?	Yes	Departmental leads accountable for communicating to users.		Project Team
	Communication ready	No	Need to create email temp		Project Team
	Training ready	Yes	Will leverage video from Microsoft		Project Team
Status	Release Status	In progress			
	Release Sign off	<exce sponsor>			
	Release Date				

Skype for Business Online retirement

12/5/2020 • 7 minutes to read • Edit Online

In July 2019, we announced **Skype for Business Online will be retired on July 31, 2021,** giving our customers two years to plan their transitions to Microsoft Teams, the hub for teamwork in Microsoft 365. With less than a year remaining, we want to ensure customers have the information and resources they need to plan and execute a successful upgrade to Teams.

Why is Skype for Business Online retiring?

Since its introduction, Skype for Business Online has been a valuable tool for millions of people around the world. By combining instant messaging, calling, and video into one application, Skype for Business Online established new possibilities for business communications. Microsoft Teams is the next chapter in that vision.

The capabilities of Microsoft Teams go beyond those of Skype for Business Online. By combining chat, video, calling, document collaboration, and application integration into a single experience, Teams enables entirely news way of working. And ongoing platform innovation and development means Teams users benefit from richer performance, functionality, flexibility, and security.

Teams isn't just an upgrade for Skype for Business Online, it's a powerful tool that enables companies, schools, and organizations to become more agile and improve the efficiency of key workflows. Learn more about the potential benefits of Teams for your organization in the Forrester white paper, The Total Economic Impact™ of Microsoft Teams.

What does this mean for Skype for Business customers?

After Skype for Business Online retires on July 31, 2021, the service will no longer be accessible. Until then, current Skype for Business Online customers will experience no change in service and will be able to add new users as needed. As of September 1, 2019, all new Microsoft 365 customers have been onboarded directly to Teams for chat, meetings, and calling.

The time needed to fully transition to Teams will vary based upon the unique characteristics of the organization, including number of users, technical complexity, and internal adaptability to change. As such, we recommend planning your upgrade to Teams today, not only to ensure adequate time to execute a successful transition from Skype for Business, but to more quickly realize the benefits of Teams.

Teams is available in most Microsoft 365 Business and Enterprise plans, and your existing licensing investments carry forward to Teams. Capabilities that are premium workloads in Skype for Business Online today will continue to be premium workloads in Teams. For example, if you have purchased Audio Conferencing standalone or as part of E5 with Skype for Business, Audio Conferencing will be enabled in Teams.

The Skype consumer service and Skype for Business Server are not affected by the retirement of Skype for Business Online.

Read FAQs on the process of upgrading to Teams and the Teams capabilities roadmap.

What is Microsoft doing to help customers transition to Teams?

Take advantage of the broad range of resources available to help plan your Teams deployment and upgrade from Skype for Business:

- Teams deployment and upgrade documentation – Free technical guidance for IT administrators.

- FastTrack for Microsoft 365 – Teams deployment assistance available for qualifying plans.
- Teams live training – Free online training classes designed to get you and your end users up and running with Teams.
- Teams Chalk Talks – Free online workshops for IT pros and decision makers sharing best practices for some of the most popular and compelling scenarios in Teams.
- Teams upgrade planning workshops – Free interactive upgrade planning workshops, where you'll receive guidance, best practices and resources designed to help you plan and implement your upgrade to Teams.
- Microsoft Partners – Microsoft solution providers can help you take full advantage of Teams.
- Microsoft Teams blog – Get the latest Teams news covering new features, adoption and usage resources, Teams devices, and integration with other business productivity applications.

If you're a current Skype for Business Online customer, start planning your migration to Teams today. We're excited for you to experience its powerful communication and collaboration capabilities, and we're committed to helping along the way.

Skype for Business Online retirement FAQs

Will current Skype for Business Online customers be able to add new seats to their tenant?
Yes. Current Skype for Business Online customers may add new seats to their tenant with the understanding they will eventually need to transition these users to Microsoft Teams.

What is the future of Skype for Business Server?
We recognize customers are using Skype for Business Server and many need to continue to use Skype for Business Server for some users or geographies due to their requirements. In these instances, we encourage organizations to adopt Teams along with Skype for Business Server to drive teamwork and collaboration. The latest version of Skype for Business Server 2019 was released in October 2018 with Mainstream Support planned through January 9, 2024.

What does this mean for the Skype consumer service?
The retirement of Skype for Business Online will not impact the Skype consumer service.

What does this mean for existing Microsoft 365 customers?
We've brought the key set of Skype for Business Online capabilities into Teams along with new voice, video, and meetings innovation. We encourage all Microsoft 365 customers to start using Teams today within their organization, independently or side by side with Skype for Business Online and/or Skype for Business Server.

Will you continue to invest in improving Skype for Business Online?
We plan to support Skype for Business Online through the July 31, 2021 retirement date. However, with Microsoft Teams replacing Skype for Business Online as the core communications solution for Microsoft 365, it will continue to be where ongoing development and innovation is focused. Customers seeking the latest functionality and performance are encouraged to upgrade to Microsoft Teams.

What do you recommend for customers who are currently in the process of deploying — or planning to deploy — Skype for Business in Microsoft 365?
Customers currently deploying Skype for Business Online may continue to do so. We encourage all new Microsoft 365 customers to start using Teams, independently of or in parallel with Skype for Business and determine the path (coexistence or Teams Only) and timing that meets their business needs. Regardless of tenure with Skype for Business Online, customers will need to move to Teams before the Skype for Business Online retirement date.

What does this mean from a licensing perspective? How will customers pay for Intelligent Communications services in Teams?
Teams is available in many of the Microsoft 365 suites. Capabilities that are premium workloads in Skype for

Business Online today will continue to be premium workloads in Teams. Existing licensing investments made by customers carry forward to Teams. For example, if a customer has purchased Audio Conferencing standalone or as part of E5 with Skype for Business, Audio Conferencing will be enabled in Teams as it's available today.

Is Microsoft planning scheduled upgrades?

Currently, we have no plans to schedule upgrades for enterprise customers. Customers can choose to move to Teams as it makes sense for their organizations before the July 31, 2021 retirement date for Skype for Business Online. We'll empower administrators and users with tools and guidance to help with the transition to Teams.

To support smaller customers that may not have dedicated IT resources, Microsoft is assisting with automated upgrades from Skype for Business Online to Teams. Eligible customers are notified of the upgrade through emails and Message Center notifications. More details are provided in the communications. For more information, see Automated Upgrades from Skype for Business Online to Microsoft Teams.

How does the Skype for Business Online retirement announcement affect organizations with hybrid configurations (Skype for Business Online and Skype for Business Server)?

Hybrid customers with online and on-prem configurations will be required to transition users from Skype for Business Online to Microsoft Teams by the July 31, 2021 retirement date. Upgrade paths for hybrid configurations built around principles of coexistence and interoperability will remain after the retirement of Skype for Business Online. For more information, see Coexistence with Skype for Business and Understand Microsoft Teams and Skype for Business coexistence and interoperability.

How will the retirement of Skype for Business Online affect organizations with hybrid Skype for Business configurations for on-premises Public Switched Telephone Network (PSTN) connectivity and online Phone System capabilities?

Some organizations have split users between homed on-premises for PSTN connectivity and homed online for Phone System capabilities. Once access to Skype for Business Online ends, organizations will need to transition online users to Microsoft Teams and connect their on-premises telephony network to Teams through Direct Routing.

Customers with eligible subscriptions are encouraged to engage with FastTrack for Teams onboarding assistance.

FAQ — Upgrading from Skype for Business to Microsoft Teams

12/5/2020 • 10 minutes to read • Edit Online

General questions

Is there a firm deadline by which customers need to move from Skype for Business Online to Teams?
Yes. Skype for Business Online will be retired on July 31, 2021, at which point it will no longer be accessible or supported. We encourage Skype for Business Online customers to start using Teams and begin planning their upgrades now to allow ample time to complete upgrade prior to the retirement date.

How long will it take to upgrade my organization to Teams?
Your organization's journey from Skype for Business to Teams can be defined by you. To assist in your planning and execution, we've developed comprehensive upgrade guidance based upon a proven framework designed to help you navigate the technical and organizational elements of change. Start your journey by familiarizing yourself with our upgrade success framework and associated resources that serve as the cornerstone for navigating your journey from Skype for Business to Teams.

Is there a recommended upgrade path for Skype for Business?
We encourage you to plan the journey from Skype for Business to Teams leveraging the guidance and resources at aka.ms/SkypetoTeams and attend a free upgrade planning workshop to identify and implement the upgrade path that best meets the needs of your organization.

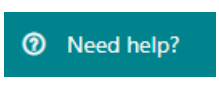
Where can I learn more about coexistence modes in the Microsoft Teams admin center?
Within the Microsoft Teams admin center, you'll notice options for coexistence modes, enabling your organization to manage the Skype for Business to Teams journey that's right for your organization. Learn more about coexistence and upgrade modes.

What should I do to prepare for my upgrade?
A successful upgrade will include validating technical readiness in addition to user acceptance readiness. Even if you determine your organization isn't quite ready to upgrade to Teams, you can begin the planning process today. Further, you can start realizing the value of Teams by enabling Teams alongside Skype for Business. Get started on your [Skype to Teams journey[(https://aka.ms/skypetoteams-home) today.

Microsoft also offers live, interactive workshops in which we'll share guidance, best practices, and resources designed to kick start upgrade planning and implementation. Learn about upgrade planning workshops.

My organization is already running Teams alongside Skype for Business. Can I just disable Skype for Business?
No, you'll want to switch users to Teams Only mode to complete the upgrade to Teams. If your organization is ready to upgrade to Teams, take time to communicate to users to let them know what's happening and allow them to acclimate to Teams. This will help ensure they have a positive upgrade experience and help alleviate calls to your helpdesk. For sample communication templates, download our Upgrade Success Kit.

Who can I contact if I have questions about the upgrade process?
For questions related to your upgrade, reach out to your current points of contact, which might include your assigned Microsoft account team, partner, or FastTrack. Alternatively, you can open a help ticket from within your Microsoft Teams admin center by clicking the **Need help** button.



Do I upgrade all users on my tenant together, or can I opt to upgrade select users at a time?

You have the flexibility to upgrade users to Teams as it makes sense for you, whether it's individuals, groups of users, or your entire organization. To help understand the optimal approach for your organization, review the various coexistence and upgrade modes you can enable.

What happens after my users are upgraded?

After your users are upgraded to Teams (**Teams Only** mode):

- Their Skype for Business client will be disabled for use as all chat and calls will go to Teams. This client will continue to be used for previously scheduled Skype for Business meetings. If this desktop client is uninstalled, users will be redirected to access previously scheduled Skype for Business meetings via the Skype for Business web app.
- Any Skype for Business meetings scheduled before the upgrade will work as designed, but all new meetings will be scheduled in Teams. If users attempt to sign-in to Skype for Business, they'll get a notification from their client that they've been upgraded to Teams. Users will need to manually uninstall the Skype for Business client on their mobile device.

Will users still be able to use Skype for Business after I activate the upgrade notification in their client?

Yes, the upgrade notification will simply alert users that Skype for Business will be upgrading to Teams and invite them to get started with Teams if they haven't already. We recommend complementing this notification with an awareness campaign (emails, FAQs, helpdesk readiness, posters/signage) to communicate further details specific to your organization, such as timing for the upgrade, calls-to-action for the user, access to training, and so on. For communication templates, download our Upgrade Success Kit.

What does this mean from a licensing perspective? How will customers pay for Intelligent Communications services in Teams?

Teams is available in Microsoft 365 and Office 365 suites. Capabilities that are premium workloads in Skype for Business Online today will continue to be premium workloads in Teams. Existing licensing investments made by customers carry forward to Teams. For example, if a customer has purchased Audio Conferencing standalone or as part of E5 with Skype for Business, Audio Conferencing will be enabled in Teams as it's available today.

Is Microsoft planning scheduled upgrades?

Currently, we have no plans to schedule upgrades for enterprise customers. Customers can choose to move to Teams as it makes sense for their organizations before the July 31, 2021 retirement date for Skype for Business Online. We'll empower administrators and users with tools and guidance to help with the transition to Teams.

In effort to support smaller customers that may not have dedicated IT resources, Microsoft is assisting with automated upgrades from Skype for Business Online to Teams. Eligible customers are notified of the upgrade through emails and Message Center notifications. More details are provided in the communications. For more information, see Automated Upgrades from Skype for Business Online to Microsoft Teams.

Microsoft Teams capabilities and roadmap

What are the benefits of Teams' back-end infrastructure?

Teams is built for the cloud on a highly scalable microservices architecture that's efficient in bandwidth consumption, provides more robust telemetry, and enables maintenance and upgrades with minimal disruption. As a result, users see faster meeting join times and a better browser experience without needing to download plug-ins. This modern infrastructure makes it easy to tap into Microsoft Cognitive Services—which include transcription, translation, speech recognition, and machine learning capabilities—and have the power to make communication and collaboration easier and more effective.

How can customers learn when Skype for Business capabilities will be available in Teams?

See the Microsoft 365 Roadmap.

Which APIs and SDKs will be made available for Teams?

Visit the Microsoft Teams developer platform for information about available APIs and SDKs.

Will you support third-party development opportunities in Teams?

Yes, app integration is one of the key benefits of adopting Teams. We currently support third-party bots, connectors, and extensions in Teams. In addition, we have a large ecosystem of add-ins available in the Microsoft Teams app store.

Is Teams available in Microsoft 365 Education?

Teams is available in all Microsoft 365 Education suite licensing (Microsoft A1, A3 and A5).

Is Teams available in the government community cloud (GCC)?

Yes, Teams is available for the US Government Cloud Community (GCC). To learn more, see plan for Microsoft 365 GCC deployments.

Calling capabilities

What is the plan for Microsoft's online voice capabilities?

The core of our voice solution is Phone System which is available today. Customers can additionally add a Microsoft Calling Plan which provides complete support for calling including number acquisition and assignment directly in Microsoft 365. Customers who want to keep their telecom telephone trunks can use Direct Routing – which is included as part of Phone System. Mix and match both together as you see fit for your organization's needs to have a complete voice solution.

What is the guidance for customers already deployed on Phone System (Cloud PBX) in Skype for Business Online?

Calling in Microsoft Teams is ready for all your communication needs. We encourage all Microsoft 365 customers to start using Teams, independently of or in parallel with Skype for Business.

What is the guidance for customers using Enterprise Voice today who want to move to Teams and use calling capabilities?

Customers interested in bringing their own telephone service to Teams can now do so with the general availability of Direct Routing. Direct Routing and Calling Plans are the two choices for dial tone in Microsoft Teams.

Meeting capabilities

Is Audio Conferencing coverage in Teams different in Skype for Business?

There will be no change in the coverage for Audio Conferencing as a result of its availability in Teams. The coverage of 90+ countries and 400+ cities we have today will continue to persist in both products. For the current list, see Country and region availability for Audio Conferencing and Calling Plans.

Are third-party audio conferencing providers (ACP) supported in Teams?

There are no plans to support third-party audio conferencing providers (ACP) in Teams. We believe the best audio conferencing experience for customers using Teams and Skype for Business will be to use our Audio Conferencing services. Customers who need to leverage ACP support in Skype for Business meetings can continue to use their Skype for Business client to join Skype for Business meetings. Meetings scheduled in Teams will need to utilize the Audio Conferencing services of Microsoft 365.

Support for the integration of third-party party audio conferencing providers (ACP)in Skype for Business Online has been extended to July 31, 2021, with limited support for remaining active tenants to allow additional time for transition. This is an update in the ACP timeline announced in April 2018.

What's the plan for video interoperability support for Teams meetings?

Meeting room devices are critical to our vision for the modern workplace. Cloud video interoperability services to support Teams meetings with existing VTC systems are available through our partners Pexip, Polycom, and Blue Jeans.

Will the latest generation of Skype Room Systems v2 support meetings in Teams?

We rebranded Skype Room Systems to Microsoft Teams Rooms which fully supports Microsoft Teams meetings and offer an easy migration path from Skype for Business to Teams by just enabling Teams on the device.

In addition to the ability for users to identify nearby Microsoft Teams Rooms with proximity detection, Teams meetings can be joined with a single-click, dual screen support, Microsoft Whiteboard and we continue to bring innovative features like content camera with intelligent capture.

Will Skype Room Systems v1 be updated to support Teams meetings?

Lync Room System (LRS) devices with Skype Room System Version 1 (SRS v1) software has reached end of support on October 9, 2018. This means Skype Room Systems v1 software will no longer get any product updates or fixes anymore. Customers with Lync Room System devices using Skype Room System v1 software are advised to upgrade their devices to Microsoft Teams Rooms. To learn more, see Migrate Lync Room System (LRS) devices to Microsoft Teams Rooms.

Is Skype Meeting Broadcast going to retire at the same time as Skype for Business Online?

Yes. Teams live events is the successor solution to Skype Meeting Broadcast.

Management capabilities

What are the management experiences for Teams?

Like the Skype for Business Admin Console, the Microsoft Teams admin within the Microsoft 365 admin center is the single place to administer new Teams experiences. With this portal, administrators can create custom presence, chat, app, meeting, and voice policies and assign those policies to Teams users.

Device compatibility

Can I use Teams on Surface Hub?

Teams meetings is now available on Surface Hub with Calling and Meetings experiences. For more information, see Deploy Microsoft Teams for Surface Hub.

Will current third-party IP (3PIP) phones continue to work with Microsoft Teams? What about third-party SIP phones?

Being able to use existing hardware can provide important cost savings when moving to a new phone system. Microsoft has extended support for Skype for Business (3PIP) phones beyond 2023 so you can continue to use your existing Skype for Business phones as you move to Teams. Additionally, starting in the first half of 2021, Teams will support core calling features on SIP phones from Cisco, Yealink, Polycom, and others.

Will certified Skype for Business online phones work with Teams?

For questions related to phone compatibility, read Certified Skype for Business Online Phones and what this means for Teams.

Upgrade from Skype for Business to Teams — for IT administrators

12/5/2020 • 2 minutes to read • Edit Online

Overview

When upgrading from Skype for Business to Teams, some organizations require a progressive rollout that is planned and managed by their IT departments. The articles in this section apply primarily to IT administrators in large organizations. These organizations are typically on-premises, but they might also be large Skype for Business Online organizations. Before reading these articles, be sure to read Getting started with your Teams Upgrade and About the Upgrade framework.

The following articles will guide you through the upgrade process for your organization:

- Upgrade methods
- Tools for managing your upgrade
- Additional considerations for organizations with Skype for Business on-premises
- Implement your upgrade
- Public Switched Telephone Network (PSTN) considerations

In addition, the following articles describe important upgrade concepts and coexistence behaviors:

- Coexistence of Teams and Skype for Business
- Coexistence modes - Reference
- Teams client experience and conformance to coexistence modes

> **NOTE**
> These articles use the terms Skype for Business Online, Skype for Business Server on-premises, and Skype for Business. The latter term refers to both online and on-premises versions.

Before you get started, be aware that a user who has been migrated to Teams no longer uses a Skype for Business client except to join a meeting hosted in Skype for Business. All incoming chats and calls land in the user's Teams client, regardless of whether the sender uses Teams or Skype for Business. Any new meetings organized by the migrated user will be scheduled as Teams meetings. If the user attempts to use the Skype for Business client, initiation of chats and calls is blocked. However, the user can (and must) still use the Skype for Business client to join Skype for Business meetings they are invited to. (Older Skype for Business clients that shipped before 2017 do not honor TeamsUpgradePolicy. Make sure you are using the latest Skype for Business client.)

You manage your user's transition to Teams using the concept of mode, which is a property of TeamsUpgradePolicy. A user who has been migrated to Teams as described above is in "TeamsOnly" mode. For an organization that is migrating to Teams, the ultimate goal is to move all users to TeamsOnly mode.

> **NOTE**
>
> Users who have a Skype for Business on-premises account cannot be TeamsOnly. Although these users can use Teams in Islands mode, this does not provide the full set of Teams functionality that is available in TeamsOnly mode. To make these users TeamsOnly, they must be moved to the cloud using `Move-CsUser` in the on-premises Skype for Business Server tools.

OK. Let's get started. The first step is understanding the upgrade methods available to you.

Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Configure hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365

Move users between on-premises and cloud

Setting your coexistence and upgrade settings

Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

Upgrade methods — for IT administrators

11/2/2020 • 13 minutes to read • Edit Online

This article describes upgrade methods for migrating to Teams. This article is the second of several that describe upgrade concepts and implementation for IT administrators.

- Overview
- **Upgrade methods** (This article)
- Tools for managing your upgrade
- Additional considerations for organizations with Skype for Business on-premises
- Implementing your upgrade
- Public Switched Telephone Network (PSTN) considerations

In addition, the following articles describe important upgrade concepts and coexistence behaviors:

- Coexistence of Teams and Skype for Business
- Coexistence modes - Reference
- Teams client experience and conformance to coexistence modes

Upgrade methods

There are two methods for upgrading an existing organization with Skype for Business (whether online or on-premises) to Teams: Overlapping capabilities method, and the Select capabilities method. This article helps you choose the right method for your organization by describing both methods and presenting the pros and cons of each.

- Overlapping capabilities method (using Islands mode)

  Users in an existing Skype for Business organization are introduced to Teams so that they can use both clients during a transitional phase. During this period, most--but not all--functionality of Teams is available to them. The mode for this configuration is referred to as Islands, and this is the default mode for any existing organization with Skype for Business. Once the organization is ready, the administrator moves users to TeamsOnly mode.

- Select capabilities method (using one or more of the Skype for Business modes)

  The administrator manages the transition (from Skype for Business to Teams) of chat, calling, and meeting scheduling functionality for users in their organization. Each of these functions is available either in Skype for Business or Teams, but not both. Administrators use TeamsUpgradePolicy to control when to shift this functionality to Teams for their users. Users who are not yet in TeamsOnly mode continue to use Skype for Business for chat and calling, and the two sets of users can communicate via interop functionality. Administrators manage the transition by progressively migrating more users into TeamsOnly mode.

After you understand and choose your upgrade method, you can learn about the tools for managing your organization's upgrade to Teams.

Overlapping capabilities method (using Islands mode)

With the overlapping capabilities method, users can use both Teams and Skype for Business clients for chat, VoIP calling, and meetings. This state is referred to as “Islands” mode because the communication traffic for Skype for Business and Teams remains separate (even for the same user) and the two different clients never communicate

with each other (for users within the same organization). For example, assume recipient User A is in Islands mode:

- Communication initiated from another user's Skype for Business client will always land in User A's Skype for Business client.
- Communication initiated from another user's Teams client will always land in User A's Teams client, *if the other user is in the same organization*.
- Communication initiated from another user's Teams client will always land in User A's Skype for Business client, *if the other user is in a federated organization*.

Islands mode is the default mode of TeamsUpgradePolicy for any existing organization that has not yet upgraded to TeamsOnly. When you assign a Microsoft 365 or Office 365 license, both Teams and Skype for Business Online licenses are assigned by default. (This is true even if the user is homed on-premises in Skype for Business Server. Whether the user is homed on-premises or online, leave the Skype for Business Online license enabled, because it is currently needed for full Teams functionality.) In fact, if you have not taken any steps to change the default configuration, you may already have significant usage of Teams in your organization. This is one of the benefits of the overlapping capabilities approach. It allows for rapid, end-user driven adoption within an organization.

For this method to work effectively, it requires all users to run both clients simultaneously. Incoming chats and calls from within the organization to a user in Islands mode can land in either the Skype for Business or Teams client--and this is not under the control of the recipient. If the sender and recipient are in the same organization, it depends on what client the sender uses to initiate the communication. If the sender and recipient are in different organizations, incoming calls and chats to a user in Islands mode always land in the Skype for Business client.

For example, if an Islands mode recipient is running Skype for Business but not Teams, and someone in the same organization messages them from Teams, the Islands mode recipient will not see the message (but they will eventually get an email saying they missed a message in Teams). Likewise, if a user is running Teams but not Skype for Business, and someone messages that user from Skype for Business, the user will not see that chat. They will get an email saying there was a missed message. The behavior in each of these cases is similar for calling. If users do not run both clients, it can easily lead to frustration.

When User A is in Islands mode, User A's presence as seen by other users in Teams and in Skype for Business is independent:

- Other users, when using Teams, will see presence based on User A's activity in Teams.
- Other users, when using Skype for Business, will see presence based on User A's activity in Skype for Business.

This means other users may see different presence states for User A, depending on which client they use. For more information, see Presence.

Once you're ready to upgrade users to TeamsOnly mode, you can upgrade users individually or you can upgrade the entire tenant at once using the tenant-wide policy. Once a user is upgraded to TeamsOnly mode, they receive all incoming chats and calls in Teams. (Note that migration of Skype for Business meetings to Teams meetings is only triggered when applying TeamsUpgradePolicy to individual users, not on a per tenant basis. See Meeting Migration for details.)

However, non-upgraded recipients in Islands mode may continue to receive chats and calls from a TeamsOnly user in either their Skype for Business or Teams clients. This is because the Teams client maintains separate conversation threads for Teams-to-Teams and Teams-to-Skype for Business communication, even for the same user. (See Teams Conversations - Interop versus native threads.) For example, assume Islands User A uses Teams to message TeamsOnly User B. When User B replies to that chat, the communication will land in User A's Teams client. Now assume User A uses the Skype for Business client to message TeamsOnly User B. User B will receive the chat in Teams, but this will be a separate conversation in User B's Teams client compared to the other conversation. If User B replies to this conversation with User A, it will land in User A's Skype for Business client.

The following table summarizes the Teams experience for both Islands mode and TeamsOnly mode:

TEAMS EXPERIENCE	IN ISLANDS MODE	IN TEAMSONLY MODE
Incoming chats and calls received in:	Teams or Skype for Business	Teams
PSTN calls received in:	Skype for Business (Using PSTN functionality in Teams is not supported in Islands mode.)	Teams
Presence	Presence in Skype for Business and Teams is independent. Users may see different states for the same Islands user, depending on which client they use.	Presence is based solely on the user's activity in Teams. All other users, regardless of which client they use, see that presence.
Meeting Scheduling	By default, users can schedule meetings in either Teams or Skype for Business. They will see both add-ins in Outlook.	Users only schedule meetings in Teams. Only the Teams add-in is available in Outlook.

The following table summarizes the pros and cons of using the overlapping capabilities method to migrate your organization to Teams.

PROS	CONS
Allows for rapid adoption within an organization.	Potential for end-user confusion because there are two clients with similar functionality, but different user interfaces. Also, they have no control over which client the incoming chats/calls land in.
Allows users to learn and get familiar with Teams while still having full access to Skype for Business.	Potential for end-user dissatisfaction due to missed messages if the user is not running both clients. Users may complain that they are not receiving messages.
Minimal administration effort to get started in Teams.	Can be challenging to "get out of Islands" mode and move to TeamsOnly mode if not everyone in the organization is using Teams, especially if not all users are active in Teams. For example, once a subset of users is upgraded to TeamsOnly mode, those users will only send in Teams. For the rest of the population in Islands mode, those messages will always land in Teams. But if some of that population is not running Teams, they will perceive these messages as missed.
	When using Teams, users who have an on-premises account in Skype for Business Server do not have interop or federation support. This can potentially create confusion if you have a mix of Islands users--some who are homed in Skype for Business Online and some in Skype for Business on-premises.

Select capabilities method (using Skype for Business modes)

Some organizations may prefer to provide their end users a simpler, more predictable experience as their organization transitions from Skype for Business to Teams. In this model, IT administrators use one of the Skype for Business modes in TeamsUpgradePolicy to explicitly designate which users remain in Skype for Business prior to migrating to TeamsOnly mode. As they are ready to shift selected users to TeamsOnly mode, the administrator updates the mode for those users to TeamsOnly. As the deployment progresses, more and more users are transitioned from Skype for Business to TeamsOnly mode. During this transition:

- Users still on Skype for Business receive all incoming chats and calls in their Skype for Business client, regardless of whether the communication originated from the other user's Teams or Skype for Business client. In addition, for these Skype for Business users, calling and chat functionality in the Teams client are disabled to help prevent end-user confusion and to ensure proper routing.
- Users in TeamsOnly mode receive all incoming chats and calls in their Teams client, regardless of where the communication originated from: Teams, Skype for Business, or any kind of federated user.

Unlike the Islands method, in the select capabilities method, Skype for Business users and TeamsOnly users can communicate with each other. Communication between a Skype for Business user and Teams user is known as interoperability or "interop". Interop communication is possible on a one-to-one basis for chats and calls between a user in Skype for Business and another user in Teams; however, some advanced functionality may not be available. (See Interoperability.) In addition, invited users can always join either a Skype for Business or Teams meeting, however, they must use a client that corresponds to the type of meeting. For more information, see Meetings.

Because users in a select capabilities transition are typically not in Islands mode, presence for a user is consistent regardless of which client is used by the other user. If the user is in one of the Skype for Business modes, all other users see presence based on that user's activity in Skype for Business. Similarly, if a user is in TeamsOnly mode, all other users see presence based on that user's activity in Teams. For details, see Presence.

For an organization that has not yet started using Teams, the administrator should change the tenant-wide mode from Islands to SfbWithTeamsCollab. (For organizations that already have some Teams usage, the administrator should "grandfather" users already active in Teams to ensure this change does not apply to them. For details, see A select capabilities method for an organization that is already using Teams in Islands mode.)

When mode changes from Islands to SfbWithTeamsCollab, a user that has never used Teams will see no difference in how they use Skype for Business. However, should that user start to use Teams, they would only be exposed to functionality such as Teams & Channel and Files. Chat, calling and meeting scheduling would not be available in Teams, since the administrator has (for now) designated Skype for Business as the desired client for those functions.

Note: When User A changes from Islands to one of the Skype for Business modes, the Teams client of any other user that communicates with User A needs to know that User A's mode changed so it can route the communication to the appropriate client for User A. For any users who have already established native Teams-to-Teams chats with User A, it can take up to 36 hours for these other users' Teams clients to be aware of the mode change from Islands to any Skype for Business mode. In contrast, changes for an existing user to TeamsOnly mode are discovered by other clients within 2 hours.

When administrators are ready, they can shift chat, calling, and meeting scheduling for a given user to Teams all at once by updating the user's mode to TeamsOnly.

Alternatively, the administrator can first shift only meeting scheduling to Teams, while leaving chat and calling functions in Skype for Business using the SfBWithTeamsCollabAndMeetings mode. This mode allows organizations to transition to Teams for meetings--if users are not yet ready to move to TeamsOnly mode (typically because more time may be needed to migrate existing PSTN functionality). This transitional scenario is referred to as Meetings First.

The following table summarizes the pros and cons of using Skype for Business modes as a transitional step toward TeamsOnly mode.

PROS	CONS	
Predictable routing for the end user. All calls and chats either land in Skype for Business or Teams (but not both), based on administrator selection.	Interop conversations lack support for rich text, file sharing, and screen sharing. This can be worked around with on-demand meetings but this is not as seamless.	
Eliminate end-user confusion because a given functionality is only available in one client.	Users can't try both clients side by side for the same set of functionality. This may especially be a factor if the users perceive the shift from Skype for Business to Teams as a major paradigm shift.	
Allows for incremental introduction of Teams.		
Administrator is in full control of the transition from Skype for Business to Teams.		
Allows an organization to use Teams for meetings, even if it is not yet ready to move entirely to TeamsOnly mode.		
Presence of a given user as viewed by others is the same, regardless of which client they use.		

Summary of upgrade methods

The following table summarizes the upgrade methods:

OVERLAPPING CAPABILITIES (USING ISLANDS MODE)	SELECT CAPABILITIES (USING SKYPE FOR BUSINESS MODES)
Prior to being upgraded to TeamsOnly, users must run both clients simultaneously since incoming chats and calls may land in either client.	Chats and calls only land in one client, based on the recipient's mode. Non-upgraded users may run both clients, but there is no functional overlap (calling and chat are not available in Teams). Administrators can also control whether users schedule meetings in Teams or Skype for Business.
Users can use Skype for Business and Teams side by side for same functionality.	Allows administrators to introduce net new functionality of Teams to end users (Teams and Channels), without providing same functionality that also exists in Skype for Business.
Interop between Skype for Business and Teams does not exist while both users are in Islands mode. Once some users are upgraded to TeamsOnly, interop conversation may occur between those users and other users still in Islands mode. However, the Islands user could choose to use Teams and avoid the interop conversation.	Interop is required for communication between Skype for Business and Teams users.

Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Configure hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365

Move users between on-premises and cloud

Setting your coexistence and upgrade settings

Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

Tools for upgrading to Teams — for IT administrators

11/2/2020 • 5 minutes to read • Edit Online

This article describes tools for upgrading to Teams. This article is the third of several that describe upgrade concepts and implementation for IT administrators.

- Overview
- Upgrade methods
- **Tools for managing your upgrade** (This article)
- Additional considerations for organizations with Skype for Business on-premises
- Implement your upgrade
- Public Switched Telephone Network (PSTN) considerations

In addition, the following articles describe important upgrade concepts and coexistence behaviors:

- Coexistence of Teams and Skype for Business
- Coexistence modes - Reference
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Tools for managing the upgrade

Whichever upgrade method you choose, for users that already have Skype for Business Online, you manage the transition to TeamsOnly using TeamsUpgradePolicy, which controls a user's coexistence mode. For users with an on-premises account in Skype for Business Server, you also use `Move-CsUser` to move them to the cloud. For more information on each of the modes, see Coexistence modes.

Whether you perform a select capabilities transition using Skype for Business modes or simply upgrade to TeamsOnly mode from the default Islands configuration, TeamsUpgradePolicy is the primary tool for users who already have Skype for Business Online. Like any other policy in Teams, you can assign TeamsUpgradePolicy directly to a user. You can also set the policy as the tenant-wide default. Any assignment to a user takes precedence over the tenant default setting. You can manage the policy in the Teams Admin Console and in PowerShell.

You can also assign any mode of TeamsUpgradePolicy, except for TeamsOnly mode, to users homed in Skype for Business on-premises. **TeamsOnly mode can only be assigned to a user who is already homed in Skype for Business Online**. This is because interop with Skype for Business users and federation as well as Microsoft 365 Phone System functionality are only possible if the user is homed in Skype for Business Online. In addition, **you cannot assign TeamsOnly mode as the tenant-wide default if you have a Skype for Business on-premises deployment** (which is detected by presence of a lyncdiscover DNS record that points to location other than Office 365.

Users with Skype for Business accounts homed on-premises must be moved online (either to Skype for Business Online or direct to Teams) using Move-CsUser in the Skype for Business on-premises toolset. These users can be moved to TeamsOnly in either 1 or 2 steps:

- 1 step: Specify the -MoveToTeams switch in Move-CsUser. This requires Skype for Business Server 2019 or Skype for Business Server 2015 with CU8 or later.
- 2 steps: After running Move-CsUser, grant TeamsOnly mode to the user using TeamsUpgradePolicy.

Unlike other policies, it is not possible to create new instances of TeamsUpgradePolicy in Microsoft 365 or Office 365. All the existing instances are built into the service. (Note that mode is a property within TeamsUpgradePolicy,

rather than the name of a policy instance.) In some--but not all--cases, the name of the policy instance is the same as mode. In particular, to assign TeamsOnly mode to a user, you will grant the "UpgradeToTeams" instance of TeamsUpgradePolicy to that user. To see a list of all instances, you can run the following command:

```
Get-CsTeamsUpgradePolicy|ft Identity, Mode, NotifySfbUsers
```

To upgrade an online user to TeamsOnly mode, assign the "UpgradeToTeams" instance:

```
Grant-CsTeamsUpgradePolicy -PolicyName UpgradeToTeams -Identity $user
```

To upgrade an on-premise Skype for Business user to TeamsOnly mode, use Move-CsUser in the on-premises toolset:

```
Move-CsUser -identity $user -Target sipfed.online.lync.com -MoveToTeams -credential $cred
```

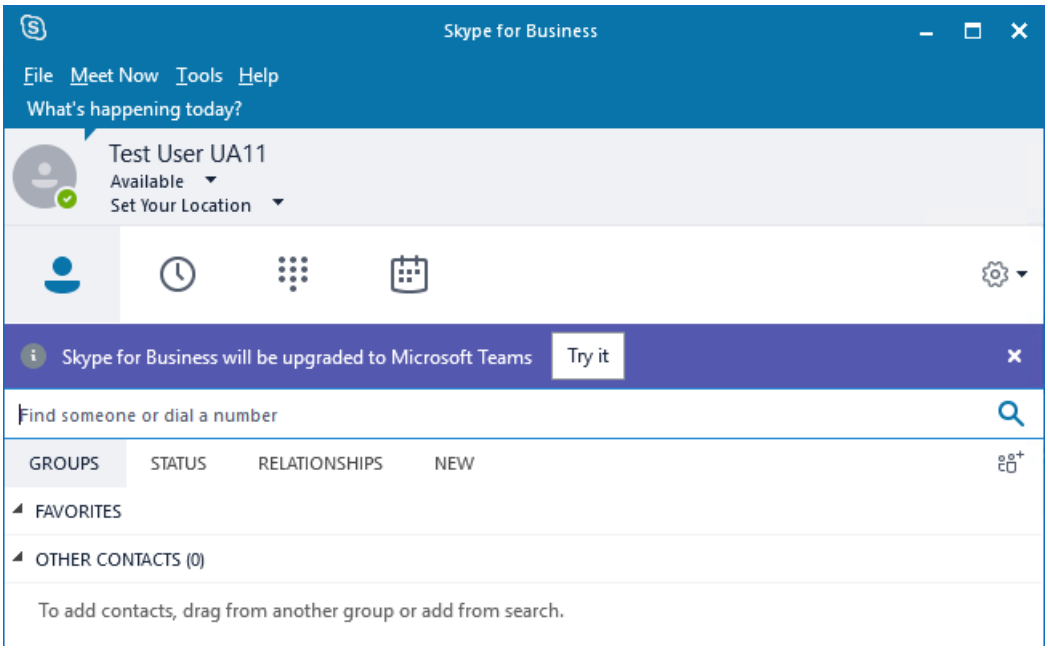
To change the mode for all users in the tenant, except those who have an explicit per-user grant (which takes precedence), run the following command:

```
Grant-CsTeamsUpgradePolicy -PolicyName SfbWithTeamsCollab -Global
```

> **NOTE**
> If you have any users with Skype for Business accounts on-premises, you cannot assign TeamsOnly mode at the tenant level. You must move these users individually to the cloud using Move-CsUser.

Using notifications in Skype for Business clients

Administrators have the option to provide end user notifications in the Skype for Business client to inform users that they will soon be upgraded to Teams, as shown in the following diagram. For example, a week before the administrator plans to upgrade a group of users to TeamsOnly mode, the administrator might want to turn on these notifications for that group of users. These notifications are enabled using an instance of TeamsUpgradePolicy with NotifySfbUsers=true. For all modes other than TeamsOnly, there are actually two instances per mode, corresponding to the two values of NotifySfbUsers. For all modes other than TeamsOnly, there are actually two instances per mode, corresponding to the two values of NotifySfbUsers.



If your users are homed in Skype for Business Online, simply assign the policy instance that has the same mode as the user, but with NotifySfbUsers=true.

If your users are homed in Skype for Business Server on-premises, you'll need to use the on-premises toolset and you'll need Skype for Business Server 2019 or CU8 for Skype for Business Server 2015. For users homed in Skype for Business Server on-premises, the mode property from the online instance of TeamsUpgradePolicy is honored, but the NotifySfbUsers property is not. If notifications are desired, you must create an on-premises instance of TeamsUpgradePolicy to control the client behavior.

In the on-premises PowerShell window, create a new instance of TeamsUpgradePolicy with NotifySfbUsers=true:

```
New-CsTeamsUpgradePolicy -Identity EnableNotification -NotifySfbUsers $true
```

Then, using the same on-premises PowerShell window, assign that new policy to the desired users:

```
Grant-CsTeamsUpgradePolicy -Identity $user -PolicyName EnableNotification
```

Meeting migration

When a user is migrated to TeamsOnly mode, by default their existing Skype for Business meetings that they organized will be converted to Teams. You can optionally disable the default behavior when assigning TeamsOnly mode to a user. When moving users from on-premises, meetings must be migrated to the cloud to function with the online user account, but if you do not specify -MoveToTeams, the meetings will be migrated as Skype for Business meetings, rather than converted to Teams.

When assigning TeamsOnly mode at the tenant level, meeting migration is not triggered for any users. If you wish to assign TeamsOnly mode at the tenant level and migrate meetings, you can use PowerShell to get a list of users in the tenant (for example, using Get-CsOnlineUser with whatever filters are needed) and then loop through each of these users to trigger meeting migration using Start-CsExMeetingMigration. For details, see Using the Meeting Migration Service (MMS).

Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Configure hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365

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Setting your coexistence and upgrade settings

Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

Upgrade considerations for organizations with Skype for Business Server on-premises — for IT administrators

11/2/2020 • 3 minutes to read • Edit Online

This article describes additional considerations for organizations with Skype for Business Server on-premises. This article is the fourth of several that describe upgrade concepts and implementation for IT administrators.

- Overview
- Upgrade methods
- Tools for managing your upgrade
- **Additional considerations for organizations with Skype for Business on-premises** (this article)
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In addition, the following articles describe important upgrade concepts and coexistence behaviors:

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Considerations for organizations with Skype for Business Server on-premises

- Setting up Skype for Business hybrid is a prerequisite to migrate to TeamsOnly mode. While it is possible to use Teams in Islands mode without hybrid, the transition to TeamsOnly mode cannot be made until the user is moved from Skype for Business on-premises to Skype for Business Online (using Move-CsUser). For more information, see Configure hybrid connectivity.

- If your organization has Skype for Business Server and you have not configured hybrid connectivity, but you still want to use Teams, to administer Teams functionality, you must use an administrative account that has an .onmicrosoft.com domain.

- Teams users who have a Skype for Business account on-premises (that is, they have not yet been moved to the cloud by using Move-CsUser) cannot interoperate with any Skype for Business users, nor can they federate with external users. This functionality is only available once the users are moved to the cloud (either in Islands mode, or as TeamsOnly users).

- If you have any users with Skype for Business accounts on-premises, you cannot assign TeamsOnly mode at the tenant level. You must first move all users with on-premises Skype for Business accounts to the cloud using `Move-CsUser` and then disable hybrid to complete migration to the cloud. `Grant-CsTeamsUpgradePolicy -PolicyName UpgradeToTeams` will not work at the tenant level if a lyncdiscover DNS record is detected that points to a location other than Office 365.

- You must ensure your users are properly synchronized into Azure AD with the correct Skype for Business attributes. These attributes are all prefixes with "msRTCSIP-". If users are not synchronized properly to Azure AD, the management tools in Teams will not be able to manage these users. (For example, you won't be able to assign Teams policies to on-premises users unless you are properly syncing these attributes.) For more information, see Configure Azure AD Connect for Teams and Skype for Business.

- To create a new TeamsOnly or Skype for Business Online user in a hybrid organization, *you must first enable the user in Skype for Business Server on-premises*, and then move the user from on-premises to the cloud using Move-CsUser. Creating the user in on-premises first ensures that any other remaining on-premises Skype for Business users will be able route to the newly created user. Once all users have been moved online, it is no longer necessary to first enable users in on-premises.
- When a user is moved from on-premises to the cloud, meetings organized by that user are migrated to either Skype for Business Online or Teams--depending on whether or not the -MoveToTeams switch is specified.
- If you would like display notifications in the Skype for Business client for on-premises users, you must use TeamsUpgradePolicy in the on-premises toolset. Only the NotifySfbUsers parameter is relevant for on-premises users. On-premises users receive their mode from the online instances of TeamsUpgradePolicy. See the notes in Grant-CsTeamsUpgradePolicy.

> **NOTE**
> Any new tenants created after Sept 3, 2019 are created as TeamsOnly tenants unless the organization already has an on-premises deployment of Skype for Business Server. Microsoft uses DNS records to identify on-premises Skype for Business Server organizations. If your organization has on-premises Skype for Business Server with no public DNS entries, you will need to call Microsoft Support to have your new tenant downgraded.

Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Configure hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365

Move users between on-premises and cloud

Setting your coexistence and upgrade settings

Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

Implement your upgrade from Skype for Business to Teams — for IT administrators

11/2/2020 • 5 minutes to read • Edit Online

This article describes how to implement your upgrade. This article is the fifth of several that describe upgrade concepts and implementation for IT administrators.

- Overview
- Upgrade methods
- Tools for managing your upgrade
- Additional considerations for organizations with Skype for Business on-premises
- **Implement your upgrade** (this article)
- Public Switched Telephone Network (PSTN) considerations

In addition, the following articles describe important upgrade concepts and coexistence behaviors:

- Coexistence of Teams and Skype for Business
- Coexistence modes - Reference
- Teams client experience and conformance to coexistence modes

Upgrade options

This section describes how to implement your upgrade by using one of the following upgrade options:

- Overlapping capabilities upgrade (using Islands mode)
- A select capabilities upgrade for an organization that has not yet started using Teams
- A select capabilities upgrade for an organization that is already using Teams in Islands mode

If you need more information about the options, make sure you have already read Upgrade methods.

Overlapping capabilities upgrade (using Islands mode)

For the overlapping capabilities upgrade option:

- Consider this option if you can do a fast upgrade for your overall organization. Since there is potential risk of confusion for end users with running both clients, it's best if you can minimize the time period during which users must run both clients. You should ensure your users know to run both clients.
- This option is the out-of-the box model, and doesn't require administrator action to get started with Teams except to assign the Microsoft 365 or Office 365 license. If your users already have Skype for Business Online, you may already be in this model.
- It can be challenging getting out of overlapping capabilities mode and moving to TeamsOnly. Because upgraded users only communicate via Teams, any other user in the organization communicating with that user must be using Teams. If you have users that have not started using Teams, they will be exposed to missing messages. Furthermore, they won't see the TeamsOnly users online in Skype for Business. Some organizations choose to do a tenant-wide upgrade using the Tenant global policy to avoid this, however that requires upfront planning as well as waiting until all users are ready to be upgraded.

A select capabilities upgrade for an organization that has not yet

started using Teams

If your organization does not yet have any active users in Teams, the first step is to set the default tenant-wide policy for TeamsUpgradePolicy to one of the Skype for Business modes, for example, SfbWithTeamsCollab. Users who have not yet started using Teams won't notice any difference in behavior. However, setting this policy at the tenant level makes it possible to start upgrading users to TeamsOnly mode, and ensures that the upgraded users can still communicate with non-upgraded users. Once you have identified your pilot users you can upgrade them to TeamsOnly. If they are on-premises, use Move-CsUser. If they are online, simply assign them TeamsOnly mode by using Grant-CsTeamsUpgradePolicy. By default, any Skype for Business meetings scheduled by these users will be migrated to Teams.

Following are the key commands:

1. Set the tenant-wide default to mode SfbWithTeamsCollab as follows:

   ```
   Grant-CsTeamsUpgradePolicy -PolicyName SfbWithTeamsCollab -Global
   ```

2. Upgrade the pilot users to TeamsOnly as follows:

   - For a user who is online:

     ```
     Grant-CsTeamsUpgradePolicy -PolicyName UpgradeToTeams -Identity $username
     ```

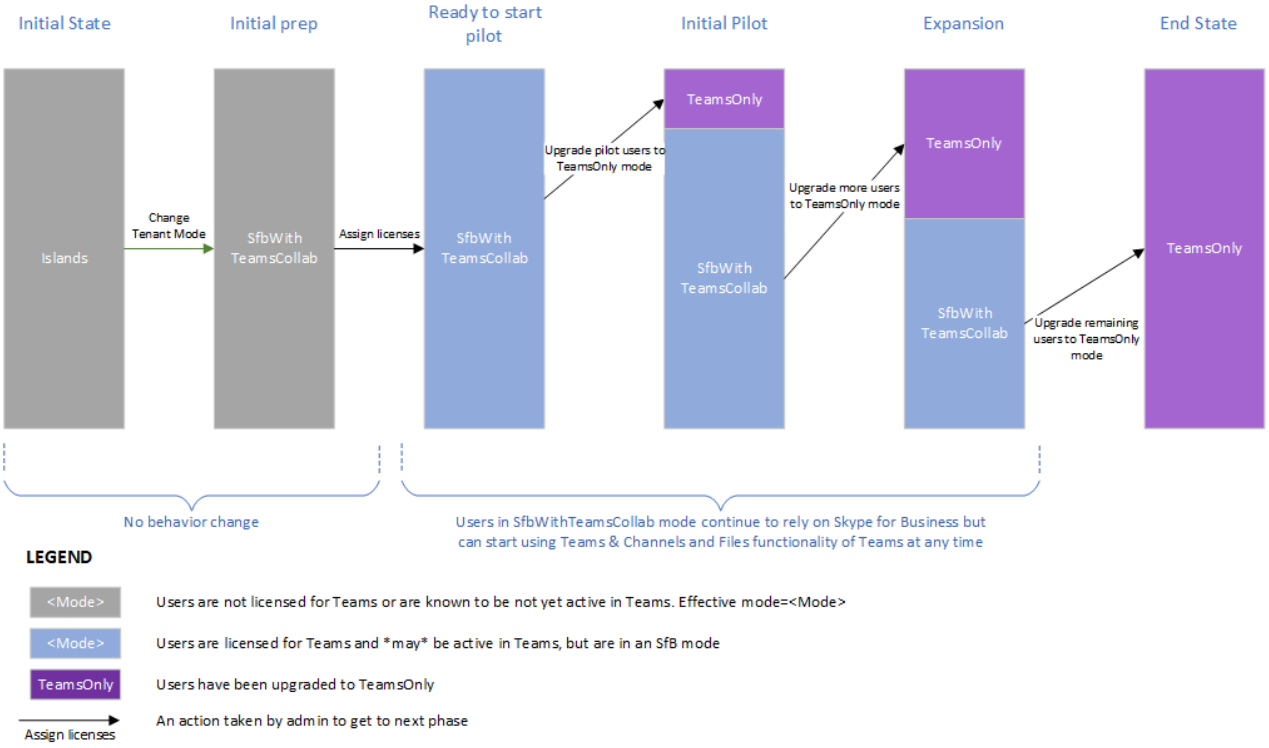
   - For a user who is on-premises:

     ```
     Move-CsUser -identity $user -Target sipfed.online.lync.com -MoveToTeams -credential $cred
     ```

Notes

- Instead of setting the tenant-wide policy to SfbWithTeamsCollab, you could set it to SfbWithTeamsCollabAndMeetings. This causes all users to schedule all new meetings in Teams.
- `Move-CsUser` is a cmdlet in the on-premises tools. The `MoveToTeams` switch requires Skype for Business Server 2019 or Skype for Business Server 2015 with CU8 or later. If you are using a prior version, you can first move the user to Skype for Business Online, and then grant TeamsOnly mode to that user.
- By default, Skype for Business meetings are migrated to Teams when upgrading to TeamsOnly mode or when assigning SfbWithTeamsCollabAndMeetings mode.

The diagram below shows the conceptual phases of select capabilities upgrade for an organization with no prior usage of Teams. The height of the bars represents number of users. During any phase of the upgrade, all users can communicate with each other. Skype for Business users communicate with TeamsOnly users using Interop, and vice versa. Users in Islands mode must be sure to run both clients.



A select capabilities upgrade for an organization that is already using Teams in Islands mode

If some users in your organization are actively using Teams in Islands mode, you probably do not want to remove functionality from existing users. Therefore, an extra step is required before changing the tenant-wide policy. The solution is to "grandfather" these existing active Teams users into Islands mode, before setting the tenant-wide policy to SfbWithTeamsCollab. Once you've done that, you can proceed with deployment as above, however, you'll have two groups of users who are moving to TeamsOnly: the users who were active in Teams will be in Islands mode, and the remaining users will be in SfbWithTeamsCollab mode. You can progressively move these users to TeamsOnly mode.

1. Find users who are active in Teams as follows:
    a. From the Microsoft 365 admin center, in the left-hand navigation, go to Reports, and then Usage.
    b. In the "Select a report" dropdown, choose Microsoft Teams, and then User Activity. This will provide an exportable table of users who have been active in Teams.
    c. Click Export, open Excel, and filter to show only the users who are active in Teams.
2. For each active Teams user found in step 1, assign them Islands mode in remote PowerShell. This allows you to go to the next step, and ensures you don't change the user experience.

```
$users=get-content "C:\MyPath\users.txt"
 foreach ($user in $users){
 Grant-CsTeamsUpgradePolicy -identity $user -PolicyName Islands}
```

3. Set the tenant-wide policy to SfbWithTeamsCollab:

```
Grant-CsTeamsUpgradePolicy -Global -PolicyName SfbWithTeamsCollab
```

4. Upgrade selected users to TeamsOnly mode. You can choose to upgrade either users in Islands mode or SfbWithTeamsCollab mode, although you might want to prioritize upgrading the users in Islands mode first to minimize the potential for confusion that can arise when users are in Islands mode.

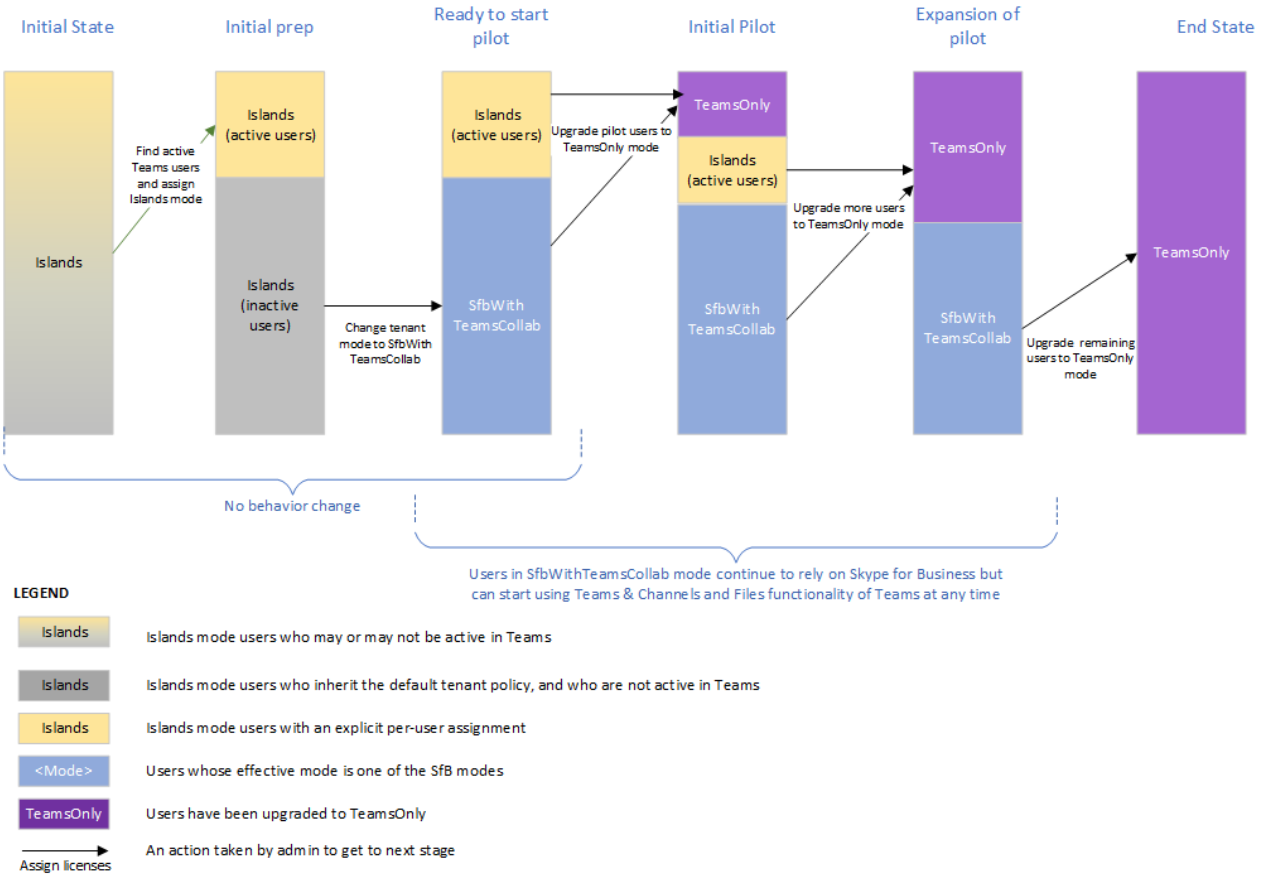
For users homed in Skype for Business Online:

```
Grant-CsTeamsUpgradePolicy -Identity $user -PolicyName UpgradeToTeams
```

For users homed in Skype for Business Server on-premises:

```
Move-CsUser -Identity $user -Target sipfed.online.lync.com -MoveToTeams -credential $cred
```

The diagram below shows the conceptual phases of a select capabilities transition in which there are active Islands users at the start. The height of the bars represents the number of users. During any phase of the upgrade, all users can communicate with each other. Skype for Business users communicate with TeamsOnly users using interop, and vice versa.



Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Configure hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365

Move users between on-premises and cloud

Setting your coexistence and upgrade settings

Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

Coexistence with Teams and Skype for Business

11/2/2020 • 7 minutes to read • Edit Online

This article summarizes behavior that may be experienced when running both Teams and Skype for Business clients in the same organization, regardless of what mode and what upgrade method is used:

- Meetings
- Interoperability
- Teams conversations-Interop versus native threads
- Presence
- Federation
- Contacts

Meetings

Regardless of their mode, users can always join any type of meeting they are invited to, whether it is Skype for Business or Teams. However, users must join the meeting with a corresponding client that matches the meeting type:

- If the meeting is a Teams meeting, all participants (whether they are TeamsOnly, Islands, or Skype for Business users) use the Teams client to join the meeting. If Teams is not installed, the user will be directed to the web, upon attempting to join a meeting.
- If the meeting is a Skype for Business meeting, all participants (whether they are TeamsOnly, Islands, or Skype for Business users) use the Skype for Business client to join the meeting. If the Skype for Business client is not installed, the user will be directed to the web to join via the Skype Meeting App.

When organizing meetings, the meeting type that gets scheduled is based on the mode of the organizer, as shown in the following table:

MODE OF ORGANIZER	BEHAVIOR
TeamsOnly, SfbWithTeamsCollabAndMeetings	All meetings scheduled in Teams. Skype for Business add-in is not available in Outlook.
SfbWithTeamsCollab, SfbOnly	All meetings scheduled in Skype for Business. Teams add-in is not available in Outlook.
Islands	By default, meetings can be scheduled in either Skype for Business or Teams. Both add-ins are available in Outlook. However, you can optionally require that users in Islands always schedule meetings in Teams by assigning them an instance of TeamsMeetingPolicy with the PreferredMeetingProviderForIslandsMode=Teams.

Interoperability

Teams supports interoperability ("interop") with Skype for Business in certain scenarios. Interop communication refers to a chat or call between a Skype for Business user and a Teams user. Interop communication is only possible between two users; multi-party chat/calling or adding additional users is not supported.

An interop chat or call between two users is created when each of the following are true:

- One user is using Teams and the other is using Skype for Business.
- The mode of the recipient of the initial communication is NOT Islands (otherwise the communication would land in the same client) if both users are in the same organization. In federated scenarios, the sending user is using Teams, and the recipient is not in TeamsOnly mode.
- The Teams user does NOT also have a Skype for Business account homed on-premises.

Within the interop communication, chat is plain-text only. In addition, file sharing and screen sharing are not possible *in the interop chat itself*. However, users in an interop conversation can easily achieve file and/or screen sharing by creating an on-demand meeting, from within the interop chat, as described below:

- If the Teams user attempts to share their screen, an on-demand Teams meeting is automatically created and an invite link to that meeting is sent to the Skype for Business user's client. Upon clicking the link, the Skype for Business user will open Teams and join the meeting. Both users are now in a Teams meeting and can share as needed.
- If the Skype for Business user is using a client from 2018 or later and attempts to share any content, an on-demand Skype for Business meeting is automatically created and an invite link to that meeting is sent to the Teams user's client. Upon clicking the link, the Teams user will attempt to join the Skype for Business meeting. If the Teams user has the Skype for Business client installed, it will open and the user is prompted to sign in (if not already signed in). If the Teams user does not have the Skype for Business client installed, the user will be prompted to use the web version. Once both users are signed in, they are in a Skype for Business meeting and can share as needed.

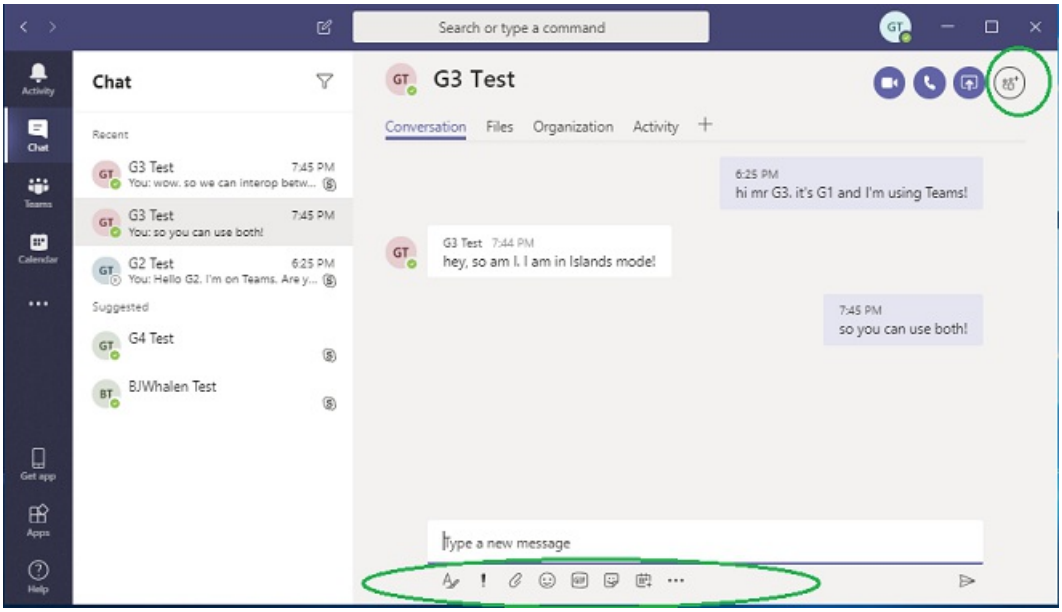
Teams conversations - Interop versus native threads

Because interop communications do not support all the features of native Teams conversation, the Teams client maintains separate conversation threads for Teams-to-Teams and Teams-to-Skype for Business communication. These conversations are rendered differently in the user interface: Interop threads can be differentiated from a regular native Teams thread by:

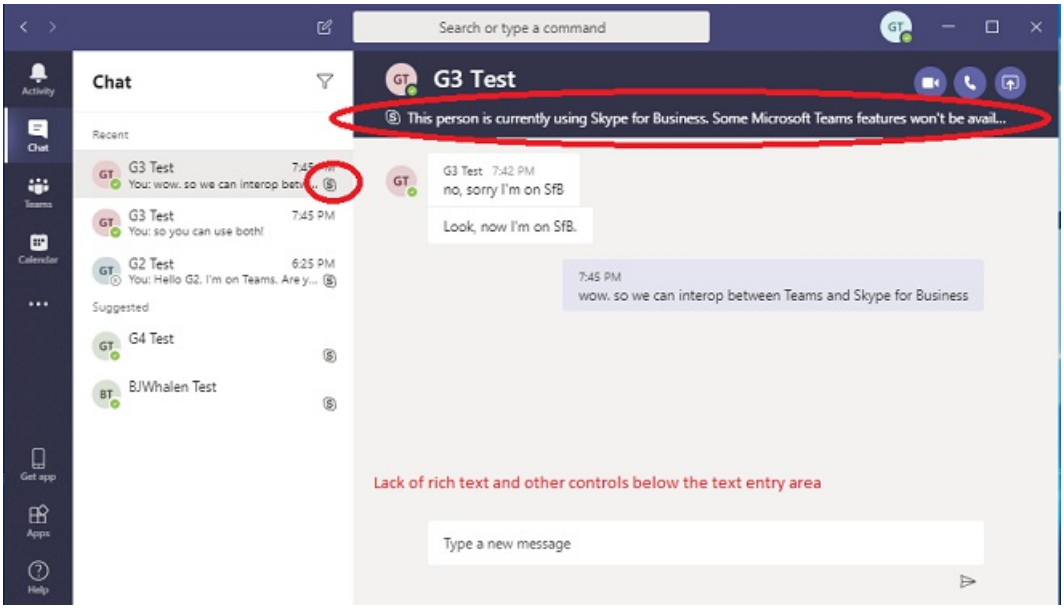
- Lack of controls for rich text, file/screen sharing, inability to add users.
- A modification to the target user's icon, showing an "S" for Skype for Business.

These differences are shown in the following screenshots:

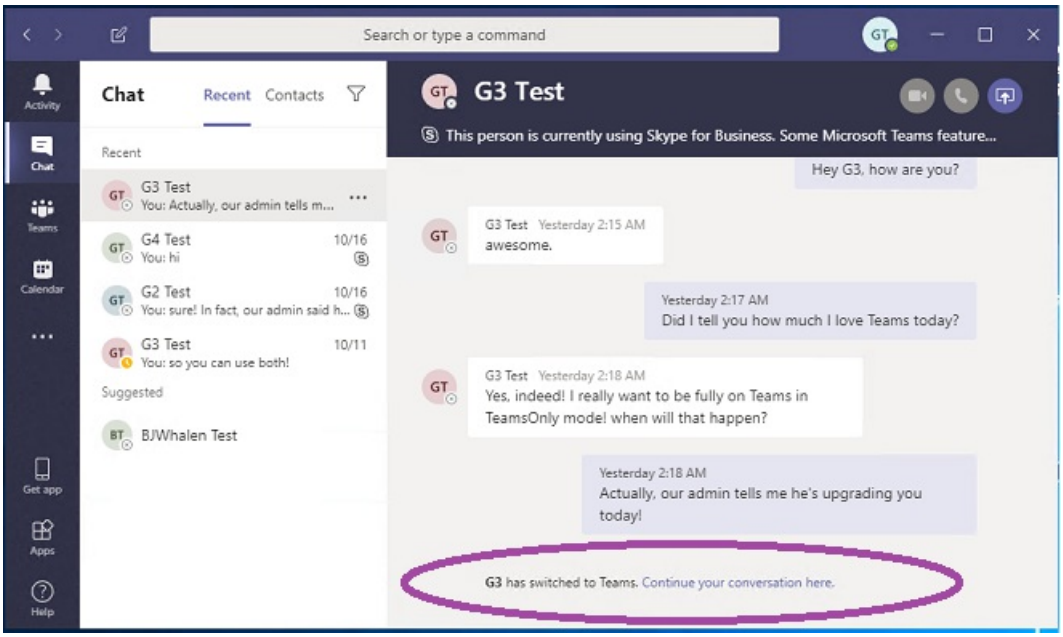
A native Teams-to-Teams conversation with User G3 Test



An interop conversation with the same User G3 Test



Once a conversation thread is created, its type never changes. Once created, an interop thread in Teams will always route to the target user's Skype for Business client. A native thread will always route to the target user's Teams client. If a recipient user's mode changes, existing Teams threads to that user will no longer function and a note will be displayed on that chat with a link to start a new native conversation as shown in the following screenshot.



Presence

Presence for a given user is based on the user's activity in the service via the client. The presence is then published for other users to see. Skype for Business and Teams are separate services with separate clients, so each service has its own presence state for a user. There is also synchronization between the presence services in Teams and in Skype for Business Online. This allows one service to potentially publish the presence of the user from the other service if needed.

Presence publishing behavior is based on the user's mode. There are three basic cases:

- If a user is in TeamsOnly mode, all other users see Teams presence for that user, regardless of which client they use.
- If a user is in any of the Skype for Business modes, all other users see Skype for Business presence for that

user, regardless of which client they use.

- If a user is in Islands mode, presence published in Skype for Business and Teams are independent, so the presence shown to users within the same organization will depend on the client of the other user. Users in federated organizations will see presence of that user based on their Skype for Business activity, since federated traffic to an Islands mode user lands in Skype for Business.

For example, Assume User A is in Islands mode. If User A is active in Teams but is not signed in to Skype for Business, other users would see User A as active from their Teams client, but in their Skype for Business client they would see User A as offline. This is by design, since User A cannot be reached if they are not running the client.

Federation

Federation from Teams to another user using Skype for Business requires the Teams user to be homed online in Skype for Business. TeamsUpgradePolicy governs routing for incoming federated chats and calls. Federated routing behavior is the same as for same-tenant scenarios, except in Islands mode. When recipients are in Islands mode:

- Chats and calls initiated from Teams land in Skype for Business if the recipient is in a federated tenant.
- Chats and calls initiated from Teams land in Teams if the recipient is in the same tenant.
- Chats and calls initiated from Skype for Business always land in Skype for Business.

A federated chat can either be a native thread or an interop thread. See Teams Conversations ---interop-versus-native-threads.

- If the receiver and sender are both in TeamsOnly upgrade mode, the conversation will be a native chat experience which includes all the rich messaging and calling capabilities. To learn more, read Native chat experience for external (federated) users in Teams.
- If either of the conversation participants is NOT in TeamsOnly upgrade mode, the conversation remains an interop experience with text-only messages. The user interface exposes federated chats in a similar manner to same-tenant interop threads, except there is a note indicating the user is external.

For more details, see Manage external access in Microsoft Teams and Native chat experience for external (federated) users in Teams.

Contacts

Teams and Skype for Business have separate lists of contacts. This means that contact additions, removal, and modifications made in one system are not synchronized to the other system. However, contacts from Skype for Business are automatically copied over to Teams when either of two specific events occur:

- For any Skype for Business Online user, the first time they log onto Teams, contacts from Skype for Business will be copied over to Teams. This behavior is not available for users with an on-premises account in Skype for Business Server.
- After a user is upgraded to TeamsOnly (either via assigning TeamsUpgradePolicy or via Move-CsUser -MoveToTeams), the next time a user logs into Teams, existing contacts in Skype for Business will be merged with existing contacts already in Teams. This behavior happens whether the user's Skype for Business Account is homed on-premises or online.

In both cases, the transfer of contacts from Skype for Business to Teams is asynchronous so it may be a few minutes before contacts appear in Teams. The two events above are what trigger the copy.

Related links

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Configure hybrid connectivity between Skype for Business Server and Microsoft 365 or Office 365

Move users between on-premises and cloud

Setting your coexistence and upgrade settings

Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

PSTN considerations when upgrading to Teams — for IT administrators

11/2/2020 • 8 minutes to read • Edit Online

This article describes Public Switched Telephone Network (PSTN) considerations when upgrading to Teams. This article is the sixth of several that describe upgrade concepts and implementation for IT administrators.

- Overview
- Upgrade methods
- Tools for managing your upgrade
- Additional considerations for organizations with Skype for Business on-premises
- Implement your upgrade
- **Public Switched Telephone Network (PSTN) considerations** (this article)

In addition, the following articles describe important upgrade concepts and coexistence behaviors:

- Coexistence of Teams and Skype for Business
- Coexistence modes - Reference
- Teams client experience and conformance to coexistence modes

> **NOTE**
> - Using Phone System with Teams is only supported when the user is in TeamsOnly mode. If the user is in Islands mode, Phone System is only supported with Skype for Business.
> - Any call forwarding, team-call group, and delegation settings from Skype for Business are not migrated and will need to be re-recreated for Teams.

PSTN calling scenarios

There are four possible calling scenarios when moving to TeamsOnly mode:

- A user in Skype for Business Online, with a Microsoft Calling Plan. Upon upgrade, this user will continue to have a Microsoft Calling plan.
- A user in Skype for Business Online, with on-premises voice functionality through Skype for Business on-premises or Cloud Connector Edition. The user's upgrade to Teams needs to be coordinated with migration of the user to Direct Routing to ensure the TeamsOnly user has PSTN functionality.
- A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and keeping on-premises PSTN connectivity. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with migration of the user to Direct Routing.
- A user in Skype for Business on-premises with Enterprise Voice, who will be moving to online and using a Microsoft Calling plan. Migrating this user to Teams requires moving the user's on-premises Skype for Business account to the cloud, and coordinating that move with either A) the port of that user's phone number to a Microsoft Calling Plan or B) assigning a new subscriber number from available regions.

This article provides a high-level overview only. For more information, see Phone System Direct Routing and Calling Plans.

From Skype for Business Online with Microsoft Calling Plans

This is the simplest upgrade scenario involving voice.

1. Make sure users have been assigned a Teams license. By default, when you assign a Microsoft 365 or Office 365 license, Teams is enabled, so unless you previously disabled the Teams license, no action should be necessary.
2. If users already have a Microsoft Calling Plan with a phone number, the only required change is to assign the user TeamsOnly mode in TeamsUpgradePolicy. Prior to assigning TeamsOnly mode, incoming PSTN calls will land in the user's Skype for Business client. After the upgrade to TeamsOnly mode, incoming PSTN calls will land in the user's Teams client.

From Skype for Business Online with on-premises voice

In this scenario, the user is already in Skype for Business Online, but their PSTN connectivity is on-premises, either using Skype for Business Server in hybrid mode or Cloud Connector Edition. Migrating these users to TeamsOnly mode with PSTN functionality means enabling them for Direct Routing, in which PSTN trunks connect directly to the Direct Routing service in the cloud, via your on-premises Session Border Controller (SBC).

The basic steps are listed below. Steps 1-4 are listed in the suggested sequence, but they can be done in any order. The key is that all of these should be completed before Step 5.

1. If you are setting the tenant-wide policy to one of the Skype for Business modes, be sure to grandfather any existing Islands users by explicitly assigning them Islands mode, as previously described.
2. Configure your tenant for Direct Routing. See Summary of per-tenant configuration of Direct Routing.
3. If desired, configure various Teams policies for these users (for example, TeamsMessagingPolicy, TeamsMeetingPolicy, etc.). This can be done at any time, but if you want to ensure that users have the correct configuration when they are upgraded, it's best to do this before the user is upgraded to TeamsOnly mode.
4. Prepare select users for voice migration:
    - If necessary, assign the Teams license. Assuming the user is already functional in Skype for Business Online on-premises voice, the user already has Skype for Business Plan 2 as well as Microsoft Phone System. Leave both those plans enabled, including the Skype for Business Online Plan 2 license.
    - Assign the desired OnlineVoiceRoutingPolicy.
5. Upgrade the user: These steps should be coordinated.
    - In Microsoft 365 or Office 365, upgrade the user to TeamsOnly mode (Grant-CsTeamsUpgradePolicy).
    - On the SBC, configure voice routing to enable incoming calls by sending calls to Direct Routing instead of to the on-premises Mediation Server.

From Skype for Business Server on-premises, with Enterprise Voice, to Direct Routing

In this scenario, the user is still homed in Skype for Business on-premises, and their PSTN connectivity is also on-premises. Migrating these users to TeamsOnly mode with PSTN functionality means enabling them for Direct Routing and then moving the user to the cloud.

The basic steps are listed below. Steps 1-5 are listed in the suggested sequence, but they can be done in any order. The key is that all of these should be completed before Step 6.

1. If you will be setting the tenant-wide policy to one of the Skype for Business modes, be sure to grandfather existing Islands users by explicitly assigning them Islands mode, as previously described.

2. If you haven't already done so, configure the organization for Skype for Business hybrid.
3. Configure your tenant for Direct Routing. See Summary of per-tenant configuration of Direct Routing.
4. If desired, configure various Teams policies for these users (e.g. TeamsMessagingPolicy, TeamsMeetingPolicy, etc.). This can be done at any time, but if you want to ensure that users have the correct configuration when they are upgraded, it's best to do this before the user is upgraded to TeamsOnly.
5. Assign the Microsoft 365 or Office 365 licenses if necessary. The user should have both Teams and Skype for Business Online Plan 2, as well as Phone System. If the Skype for Business Online Plan 2 is disabled, re-enable it.
6. Upgrade the user: These steps should be coordinated.
    - Using the on-premises Skype for Business tools, run Move-CsUser with -MoveToTeams switch. If you are using a version of Skype for Business Server that does not support the -MoveToTeams switch, first run Move-CsUser and then assign TeamsOnly mode in tenant remote PowerShell or Teams Admin Console.
    - On the SBC, configure voice routing to enable incoming calls by sending calls to Direct Routing instead of to the on-premises Mediation Server.
    - In Microsoft 365 or Office 365: Assign the relevant OnlineVoiceRoutingPolicy to enable outgoing calls.

From Skype for Business Server on-premises, with Enterprise Voice, to Microsoft Calling Plan

In this scenario, the user is still homed in Skype for Business on-premises, and their PSTN connectivity is also on-premises. Migrating these users to TeamsOnly mode with PSTN functionality means moving the user to the cloud and either porting their number from the old carrier to a Microsoft Calling plan or assigning the user a new number.

The basic steps are listed below. Steps 1-5 are listed in the suggested sequence, but they can be done in any order. The key is that all of these should be completed before Step 6.

1. If you will be setting the tenant-wide policy to one of the Skype for Business modes, be sure to grandfather existing Islands users by explicitly assigning them Islands mode, as previously described.
2. If you haven't already done so, configure the organization for Skype for Business hybrid.
3. If desired, configure various Teams policies for these users (for example, TeamsMessagingPolicy, TeamsMeetingPolicy, etc.). This can be done at any time, but if you want to ensure that users have the correct configuration when they are upgraded, it's best to do this before the user is upgraded to TeamsOnly.
4. Assign the Microsoft 365 or Office 365 licenses if necessary. The user should have both Teams and Skype for Business Online Plan 2, as well as Phone System. If the Skype for Business Online Plan 2 is disabled, re-enable it.
5. Get phone numbers for your users. (For details see Manage phone numbers for your organization.)
    - If you will be re-using the numbers, submit a porting request to your carrier.
    - Alternatively, you can acquire new numbers directly from Microsoft.
6. Upgrade the user and if needed assign LineUri. Using the on-premises Skype for Business tools, run Move-CsUser with the -MoveToTeams switch.

- If you are porting numbers to Microsoft, you should coordinate the timing of this operation to occur when the port occurs.
- If you are using new numbers from Microsoft, you'll need to change the LineUri for the user. This must be done after the user is moved online using Set-CsOnlineVoiceUser.

Summary of per-tenant configuration of Direct Routing

1. Ensure that your Session Border Controller (SBC) is supported with Direct Routing by reviewing this list. You must also ensure that you have correct version of firmware.
2. Pair your on-premises SBC with the Teams Direct Routing service. For details, see Pair the SBC to the Direct Routing service of Phone System.
3. This configuration is essentially a mirror of the on-premises configuration. The online configuration consists of:
   - OnlineVoiceRoutingPolicy (based on the on-premises VoiceRoutingPolicy if migrating users from Skype for Business Online, and based on VoicePolicy if migrating users from on-premises with Enterprise Voice).
   - OnlinePSTNUsage objects (based on on-premises PSTN usage).
   - OnlineVoiceRoute objects (based on-premises VoiceRoute).

For more information, see Configure Direct Routing.

Manage EnterpriseVoiceEnabled property during migration

Whether using Direct Routing or a Microsoft Calling plan, a user must have EnterpriseVoiceEnabled=true in Azure AD for the user to have PSTN functionality. EnterpriseVoiceEnabled ("EV-enabled") is a property (not a policy) that exists in both an on-premises directory and in the cloud. The value in the cloud is what matters for Teams. The exact logic for how EV-enabled gets set to true depends on the following scenario:

- If the user is EV-enabled in on-premises Skype for Business Server and a Phone System license is assigned to the user prior to moving the user to the cloud with Move-CsUser, the online user will be provisioned with EV-enabled=true.
- If an existing TeamsOnly or Skype for Business Online user is assigned a Phone System license, EV-enabled is not set to true by default. This also is the case if an on-premises user is moved to the cloud prior to assigning the Phone System license. In either case, the admin must specify the following cmdlet:

```
Set-CsUser -EnterpriseVoiceEnabled $True
```

Related links

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Grant-CsTeamsUpgradePolicy

Using the Meeting Migration Service (MMS)

Coexistence modes - Reference

9/17/2020 • 7 minutes to read • Edit Online

Coexistence modes provide a simple, predictable experience for end users as organizations transition from Skype for Business to Teams. For an organization moving to Teams, the TeamsOnly mode is the final destination for each user, though not all users need to be assigned TeamsOnly (or any mode) at the same time. Prior to users reaching TeamsOnly mode, organizations can use any of the Skype for Business modes (SfBOnly, SfBWithTeamsCollab, SfBWithTeamsCollabAndMeetings) to ensure predictable communication between users who are TeamsOnly and those who aren't yet.

From a technical perspective, a user's mode governs several aspects of the user's experience:

- *Incoming routing*: In which client (Teams or Skype for Business) do incoming chats and calls land?
- *Presence publishing*: Is the user's presence that is shown to other users based on their activity in Teams or Skype for Business?
- *Meeting scheduling*: Which service is used for scheduling new meetings and ensuring that the proper add-in is present in Outlook? TeamsUpgradePolicy does not govern meeting join. Users can always *join* any meeting, whether it be a Skype for Business meeting or a Teams meeting.
- *Client experience*: What functionality is available in Teams and/or Skype for Business client? Can users initiate calls and chats in Teams, Skype for Business, or both? Is Teams & Channels experience available?

For more information on routing and presence behavior based on mode, see Coexistence with Skype for Business.

However, from an experience perspective, mode can be described as defining the experience for:

- *Chat and Calling*: Which client does a user use?
- *Meeting Scheduling*: Do users schedule new meetings as Teams or Skype for Business meetings?
- *Availability of collaboration functionality in Teams client*: Is Teams & Channels and Files functionality available while users still have Skype for Business?

The modes are listed below.

MODE	CALLING AND CHAT	MEETING SCHEDULING[1]	TEAMS & CHANNELS	USE CASE
TeamsOnly[2] *Requires home in Skype for Business Online*	Teams	Teams	Yes	The final state of being upgraded. Also the default for new tenants.

MODE	CALLING AND CHAT	MEETING SCHEDULING	TEAMS & CHANNELS	USE CASE
Islands	Either	Either	Yes	Default configuration. Allows a single user to evaluate both clients side by side. Chats and calls can land in either client, so users must always run both clients. To avoid a confusing or regressed Skype for Business experience, external (federated) communications, PSTN voice services and voice applications, Office integration, and several other integrations continue to be handled by Skype for Business.
SfBWithTeamsCollabAndMeetings[2]	Skype for Business	Teams	Yes	"Meetings First". Primarily for on-premises organizations to benefit from Teams meeting functionality, if they are not yet ready to move calling to the cloud.
SfBWithTeamsCollab	Skype for Business	Skype for Business	Yes	Alternate starting point for complex organizations that need tighter administrative control.
SfBOnly	Skype for Business	Skype for Business	No[3]	Specialized scenario for organizations with strict requirements around data control. Teams is used only to join meetings scheduled by others.

Notes:

[1] The ability to join an existing meeting (whether scheduled in Teams or in Skype for Business) isn't governed by mode. By default, users can always join any meeting they have been invited to.

[2] By default, when assigning either TeamsOnly or SfbWithTeamsCollabAndMeetings to an individual user, any existing Skype for Business meetings scheduled by that user for the future are converted to Teams meetings. If desired, you can leave these meetings as Skype for Business meetings either by specifying `-MigrateMeetingsToTeams $false` when granting TeamsUpgradePolicy, or by unselecting the checkbox in the Teams Admin portal. The ability to convert meetings from Skype for Business to Teams is not available when granting TeamsUpgradePolicy on a tenant-wide basis.

[3] Currently, Teams does not have the ability to disable the Teams and Channels functionality so this remains enabled for now.

Using TeamsUpgradePolicy

TeamsUpgradePolicy exposes two key properties: Mode and NotifySfbUsers.

PARAMETER	TYPE	ALLOWED VALUES (DEFAULT IN ITALICS)	DESCRIPTION
Mode	Enum	*Islands* TeamsOnly SfBOnly SfBWithTeamsCollab SfBWithTeamsCollabAndMeetings	Indicates the mode the client should run in.
NotifySfbUsers	Bool	*False* or true	Indicates whether to show a banner in the Skype for Business client informing the user that Teams will soon replace Skype for Business. This can't be true if Mode=TeamsOnly.

Teams provides all relevant instances of TeamsUpgradePolicy via built-in, read-only policies. Therefore, only Get and Grant cmdlets are available. The built-in instances are listed below.

IDENTITY	MODE	NOTIFYSFBUSERS
Islands	Islands	False
IslandsWithNotify	Islands	True
SfBOnly	SfBOnly	False
SfBOnlyWithNotify	SfBOnly	True
SfBWithTeamsCollab	SfBWithTeamsCollab	False
SfBWithTeamsCollabWithNotify	SfBWithTeamsCollab	True
SfBWithTeamsCollabAndMeetings	SfBWithTeamsCollabAndMeetings	False

IDENTITY	MODE	NOTIFYSFBUSERS
SfBWithTeamsCollabAndMeetingsWithNotify	SfBWithTeamsCollabAndMeetings	True
UpgradeToTeams	TeamsOnly	False
Global *Default*	Islands	False

These policy instances can be granted either to individual users or on a tenant-wide basis. For example:

- To upgrade a user ($SipAddress) to Teams, grant the "UpgradeToTeams" instance:
  `Grant-CsTeamsUpgradePolicy -PolicyName UpgradeToTeams -Identity $SipAddress`
- To upgrade the entire tenant, omit the identity parameter from the grant command:
  `Grant-CsTeamsUpgradePolicy -PolicyName UpgradeToTeams`

The Teams client user experience when using Skype for Business modes

When a user is in any of the Skype for Business modes (SfBOnly, SfBWithTeamsCollab, SfBWithTeamsCollabAndMeetings), all incoming chats and calls are routed to the user's Skype for Business client. To avoid end-user confusion and ensure proper routing, calling and chat functionality in the Teams client is automatically disabled when a user is in any of the Skype for Business modes. Similarly, meeting scheduling in Teams is automatically disabled when users are in the SfBOnly or SfBWithTeamsCollab modes, and automatically enabled when a user is in the SfBWithTeamsCollabAndMeetings mode. For details, see Teams client experience and conformance to coexistence modes.

> **NOTE**
> - Prior to delivery of the automatic enforcement of Teams and Channels, the SfbOnly and SfBWithTeamsCollab modes behave the same.

Detailed mode descriptions

MODE	EXPLANATION

MODE	EXPLANATION
Islands (default)	A user runs both Skype for Business and Teams side by side. This user: • Can initiate chats and VoIP calls in either Skype for Business or Teams client. Note: Users with Skype for Business homed on-premises cannot initiate from Teams to reach another Skype for Business user, regardless of the recipient's mode. • Receives chats & VoIP calls initiated in Skype for Business by another user in their Skype for Business client. • Receives chats & VoIP calls initiated in Teams by another user in their Teams client if they are in the *same tenant*. • Receives chats & VoIP calls initiated in Teams by another user in their Skype for Business client if they are in a *federated tenant*. • Has PSTN functionality as noted below: ◦ When the user is homed in Skype for Business on-premises and has Enterprise Voice, PSTN calls are always initiated and received in Skype for Business. ◦ When the user is homed on Skype for Business Online and has Microsoft Phone System, the user always initiates and receives PSTN calls in Skype for Business: ◦ This happens whether the user has a Microsoft Calling Plan, or connects to the PSTN network through either Skype for Business Cloud Connector Edition or an on-premises deployment of Skype for Business Server (hybrid voice). ◦ **Note: Phone System Direct Routing is not supported in Islands mode.** • Receives Microsoft Call Queues and Auto-Attendant calls in Skype for Business: ◦ Phone numbers assigned to Call Queues and Auto-Attendants **cannot** be Phone System Direct Routing numbers in Islands mode. • Can schedule meetings in Teams or Skype for Business (and will see both plug-ins by default). • Can join any Skype for Business or Teams meeting; the meeting will open in the respective client.

MODE	EXPLANATION
SfBOnly	A user runs only Skype for Business. This user: • Can initiate chats and calls from Skype for Business only. • Receives any chat/call in their Skype for Business client, regardless of where initiated, unless the initiator is a Teams user with Skype for Business homed on-premises.* • Can schedule only Skype for Business meetings, but can join Skype for Business or Teams meetings. **Using Islands mode with on-premises users is not recommended in combination with other users in SfBOnly mode. If a Teams user with Skype for Business homed on-premises initiates a call or chat to an SfBOnly user, the SfBOnly user is not reachable and receives a missed chat or call email.*
SfBWithTeamsCollab	A user runs both Skype for Business and Teams side by side. This user: • Has the functionality of a user in SfBOnly mode. • Has Teams enabled only for group collaboration (Channels); chat/calling/meeting scheduling are disabled.
SfBWithTeamsCollab AndMeetings	A user runs both Skype for Business and Teams side by side. This user: • Has the chat and calling functionality of user in SfBOnly mode. • Has Teams enabled for group collaboration (channels - includes channel conversations); chat and calling are disabled. • Can schedule only Teams meetings, but can join Skype for Business or Teams meetings.
TeamsOnly (requires SfB Online home)	A user runs only Teams. This user: • Receives any chats and calls in their Teams client, regardless of where initiated. • Can initiate chats and calls from Teams only. • Can schedule meetings in Teams only, but can join Skype for Business or Teams meetings. • Can continue to use Skype for Business IP phones. *Using TeamsOnly mode in combination with other users in Islands mode is not recommended until Teams adoption is saturated; that is, all Islands mode users actively use and monitor both the Teams and Skype for Business clients. If a TeamsOnly user initiates a call or chat to an Islands user, that call or chat will land in the Islands user's Teams client; if the Islands user does not use or monitor Teams, that user will appear offline and will not be reachable by the TeamsOnly user.*

Related topics

Coexistence with Skype for Business

Teams client experience and conformance to coexistence modes

Get-CsTeamsUpgradePolicy

Grant-CsTeamsUpgradePolicy

Get-CsTeamsUpgradeConfiguration

Set-CsTeamsUpgradeConfiguration

Using the Meeting Migration Service (MMS)

Teams client experience and conformance to coexistence modes

4/27/2020 • 3 minutes to read • Edit Online

The purpose of the Skype for Business coexistence modes (SfBOnly, SfBWithTeamsCollab, SfBWithTeamsCollabAndMeetings) is to provide a simple, predictable experience for end users as organizations transition from Skype for Business to Teams. For an organization moving to Teams, the **Teams Only** mode is the final destination for each user, though not all users need to be assigned **Teams Only** (or any other mode) at the same time. Prior to users reaching TeamsOnly mode, organizations can use any of the Skype for Business coexistence modes to ensure predictable communication between users who are **Teams Only** and those who aren't yet.

When a user is in any of the Skype for Business modes, all incoming chats and calls are routed to the user's Skype for Business client. To avoid end user confusion and ensure proper routing, calling and chat functionality in the Teams client is disabled when a user is in any of the Skype for Business modes. Similarly, meeting scheduling in Teams is explicitly disabled when users are in the SfBOnly or SfBWithTeamsCollab modes, and explicitly enabled when a user is in the SfBWithTeamsCollabAndMeetings mode.

Because presence is an indication of reachability through chat and calling, when chat and calling are disabled, self-presence in Teams (that is, the display of one's own presence in the Teams client in the user's picture) is also hidden.

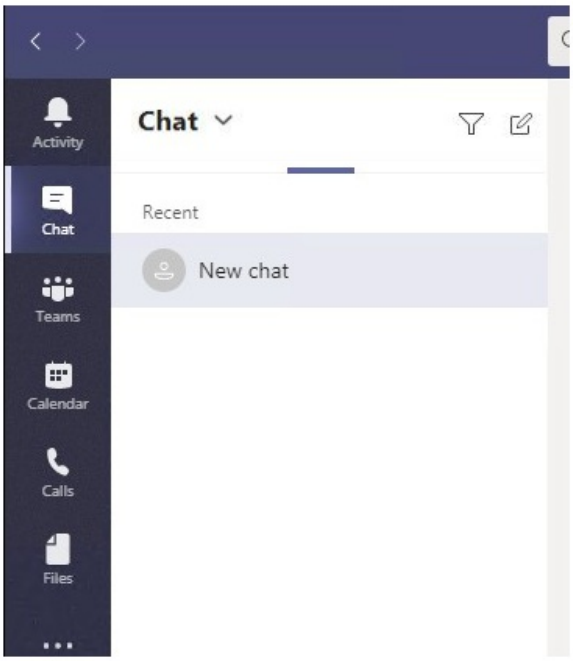
How the available functionality in Teams client changes based on mode

The available functionality in Teams depends on the user's coexistence mode, as set by TeamsUpgradePolicy. The following table summarizes the behavior:

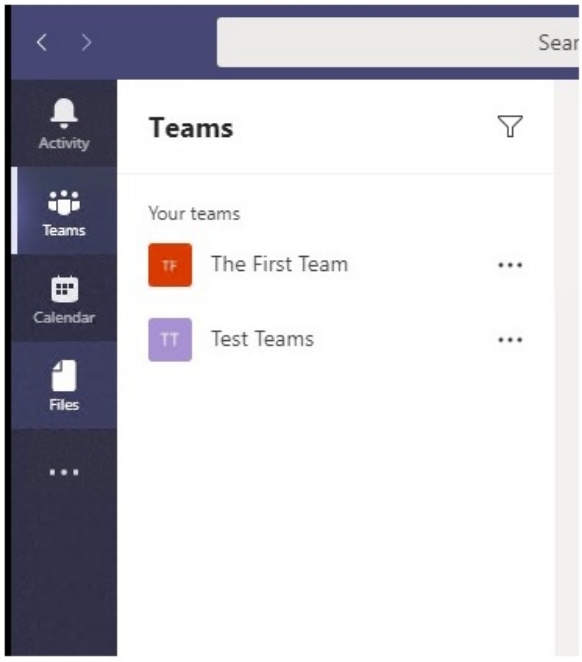
USER'S EFFECTIVE MODE	EXPERIENCE IN TEAMS CLIENT
Any Skype for Business mode	Calling, Chat, and self-presence are disabled.
SfBWithTeamsCollabAndMeetings	Meeting scheduling is available
SfBWithTeamsCollab or SfBOnly[1]	Meeting scheduling is not available

The following screenshots illustrate the difference between **Teams Only** or **Islands** mode and all other modes. Note that the chat and calling icons are available by default with **Teams Only** or **Islands** mode (left screenshot), but not with the other modes (right screenshot):

Mode = TeamsOnly or Islands

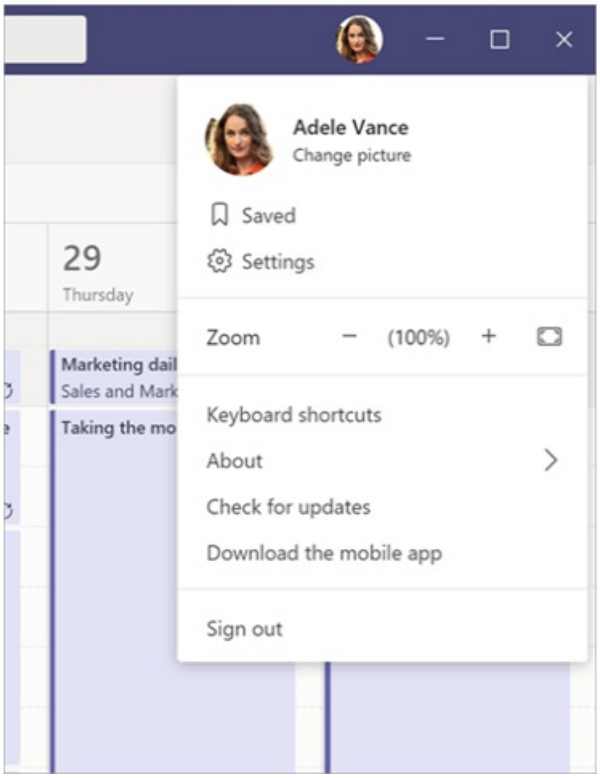


Mode = SfbOnly, SfbWithTeamsCollab, or SfbWithTeamsCollabAndMeetings



In addition, self presence is not available in the other modes, as shown here.

Mode = SfbOnly, SfbWithTeamsCollab, or SfbWithTeamsCollabAndMeetings



Note: [1] At this time, SfBwithTeamsCollab and SfBOnly behave the same, but the intent is for SfBOnly mode to also disable Channels and Files functionality in Teams. In the interim, Channels can be hidden using the App Permissions policy.

Impact of Mode on other policy settings

As described above, a user's coexistence mode impact's what functionality is available in the user's Teams client. This means that the value of mode can take precedence over the value of other policy settings, depending on the

mode. Specifically, coexistence mode impacts whether the following policy settings are honored:

MODALITY (APP)	POLICY.SETTING
Chat	TeamsMessagingPolicy.AllowUserChat
Calling	TeamsCallingPolicy.AllowPrivateCalling
Meeting scheduling	TeamsMeetingPolicy.AllowPrivateMeetingScheduling TeamsMeetingPolicy.AllowChannelMeetingScheduling

Administrators need *not* explicitly set these policy settings when using co-existence mode, but it's important to understand that these settings effectively behave as follows for a given mode.

MODE	ALLOWUSERCHAT	ALLOWPRIVATECALLING	ALLOWPRIVATEMEETINGSCHEDULING	ALLOWCHANNELMEETINGSCHEDULING
TeamsOnly or Islands	Enabled	Enabled	Enabled	Enabled
SfBWithTeamsCollabAndMeetings	Disabled	Disabled	Enabled	Enabled
SfBWithTeamsCollab or SfBOnly	Disabled	Disabled	Disabled	Disabled

When using PowerShell, the `Grant-CsTeamsUpgradePolicy` cmdlet checks the configuration of the corresponding settings in TeamsMessagingPolicy, TeamsCallingPolicy, and TeamsMeetingPolicy to determine if those settings would be superseded by TeamsUpgradePolicy and if so, an informational message is provided in PowerShell. As noted above, is no longer necessary to set these other policy settings. The following is an example of what the PowerShell warning looks like:

```
Grant-CsTeamsUpgradePolicy -Identity user1@contoso.com -PolicyName SfBWithTeamsCollab
```

```
WARNING: The user 'user1@contoso.com' currently has enabled values for: AllowUserChat, AllowPrivateCalling,
AllowPrivateMeetingScheduling, AllowChannelMeetingScheduling, however these values will be ignored. This is
because you are granting this user TeamsUpgradePolicy with mode=SfBWithTeamsCollab, which causes the Teams
client to behave as if they are disabled.
```

Related topics

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Set your coexistence and upgrade settings

9/16/2020 • 4 minutes to read • Edit Online

When you upgrade your Skype for Business users to use Teams, you have several options to help you make it a seamless process for your users. You have the option to make coexistence and upgrade settings for all of the users in your organization at once, or you can make settings changes for a single or set of users in your organization. Note that older versions of Skype for Business clients may not honor these settings. For more information about Skype for Business client versions, go to the Skype for Business downloads and updates page.

You can get a better understanding of the modes that are available to you by reading Understand Microsoft Teams and Skype for Business coexistence and interoperability or Coexistence with Skype for Business.

> **IMPORTANT**
> Having the option to upgrade doesn't necessarily mean your organization is ready for this change. For the best user experience, confirm that Teams meets your collaboration and communication requirements, make sure that your network is ready to support Teams, and implement your user readiness plan before upgrading users to Teams.

Set upgrade options for all users in your organization

Using the Microsoft Teams admin center

1. In the Microsoft Teams admin center, in the left navigation, go to **Org-wide settings** > **Teams upgrade**.
2. At the top of the **Teams upgrade** page, modify the following options as desired.
   - Set the **Coexistence** mode.
     - **Islands** - Use this setting if you want users to be able to use both Skype for Business and Teams simultaneously.
     - **Skype for Business only** - Use this setting if you want your users to only use Skype for Business.
     - **Skype for Business with Teams collaboration** - Use this setting if you want your users to use Skype for Business in addition to using Teams for group collaboration (channels).
     - **Skype for Business with Teams collaboration and meetings** - Use this setting if you want your users to use Skype for Business in addition to using Teams for group collaboration (channels) and Teams meetings.
     - **Teams only** - Use this setting if you want your users to use only Teams. Note that even with this setting, users can still join meetings hosted in Skype for Business.
   - Set **Notify Skype for Business users that Teams is available for upgrade**. If you turn this on, it will tell the Skype for Business users that they will soon be upgraded to the Teams app.
   - Set the **Preferred app for users to join Skype for Business meetings**. This setting determines which app is used for joining Skype for Business meetings and is honored regardless of the value of coexistence mode.
     - **Skype Meetings app**
     - **Skype for Business with limited features**
   - Set whether to **Download the Teams app in the background for Skype for Business users**. This setting silently downloads the Teams app for users running Skype for Business on Windows. It

is honored only if coexistence mode for the user is Teams only or if notifications of pending upgrade are enabled in Skype for Business.

3. Click **Save** after you make your changes.

Set upgrade options for a single user in your organization

Using the Microsoft Teams admin center

1. In the left navigation, go to **Users**, and then select the user from the list.
2. On the **Account** tab for the user, under **Teams upgrade**, click **Edit**.
3. You can set the **Coexistence mode**. Choose from the following options:
   - **Use Org-wide settings** - Use this setting if you want the user to use the settings in the **Org-wide** settings.
   - **Islands** - Use this setting if you want the user to be able to use both Skype for Business and Teams.
   - **Skype for Business only** - Use this setting if you want the user to use Skype for Business.
   - **Skype for Business with Teams collaboration** - Use this setting if you want the user to use Skype for Business in addition to using Teams for group collaboration (channels).
   - **Skype for Business with Teams collaboration and meetings** - Use this setting if you want the user to use Skype for Business in addition to using Teams for group collaboration (channels) and Teams meetings.
   - **Teams only** - Use this setting if you want the user to use only Teams. The user will still be able to join Skype for Business meetings.
4. If you select any **Coexistence mode** other than **Use Org-wide settings**, you have the option to enable notifications in the user's Skype for Business app that upgrade to Teams is coming soon. You can enable this notification for the user by turning on the **Notify the Skype for Business user** option.
5. Click **Save** after you make your changes.

Related topics

Upgrade from Skype for Business to Teams — for IT administrators

Plan the journey

Understand the coexistence and upgrade journey for Skype for Business and Teams

Migration and interoperability guidance for organizations using Teams together with Skype for Business

Meetings First

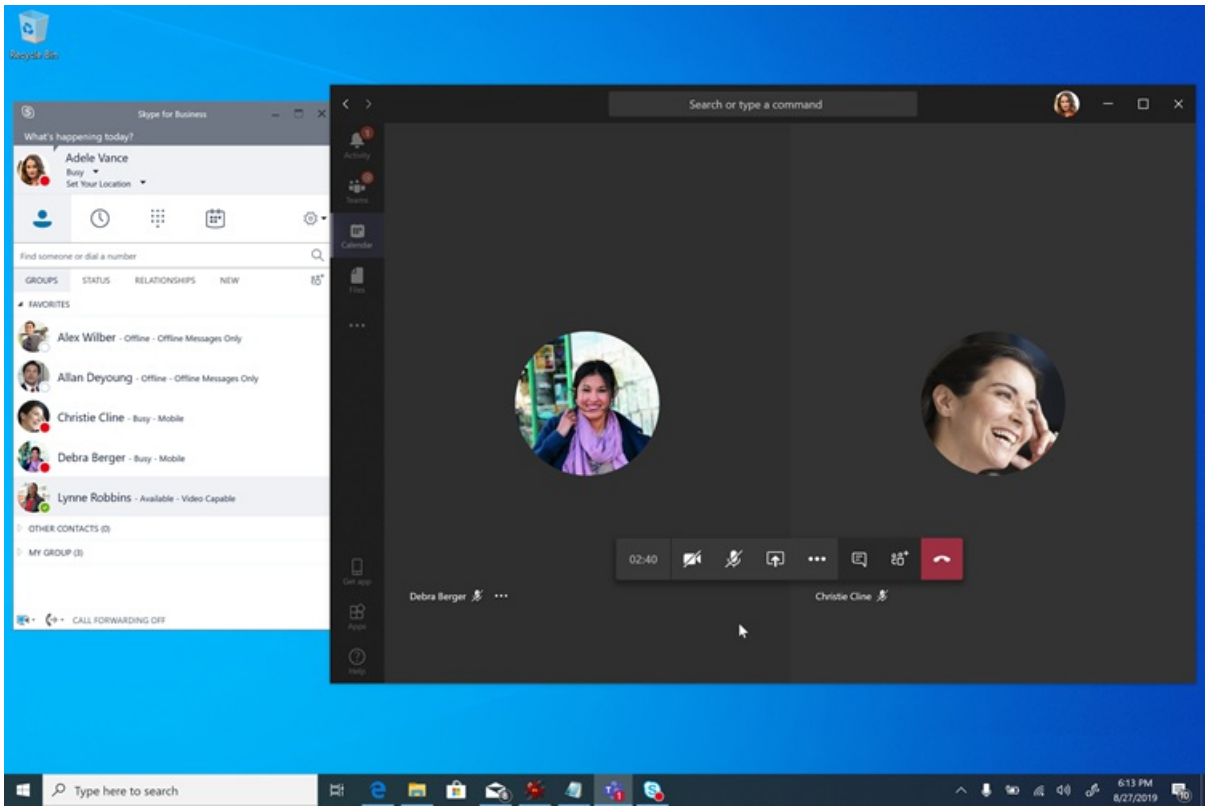
6/24/2020 • 6 minutes to read • Edit Online

"Meetings First" is targeted at and optimized for Skype for Business Server organizations with Enterprise Voice on premises who want to start using Teams meetings as rapidly as possible. For these organizations, Meetings First is an alternative to using **Islands** mode that prioritizes the Teams meetings experience.

What is Meetings First?

Meetings First is based on the **SfBWithTeamsCollabAndMeetings** coexistence mode. Meetings First is not a product or a feature—it is a configuration that leverages capabilities and features of Teams and Skype for Business to provide a uniquely tailored coexistence experience.

In Meetings First, users create their meeting in Teams, while continuing to use Skype for Business for chat, calling, and presence. There is no overlap of modalities between Teams and Skype for Business. Chat, calling, and presence are on in Skype for Business and off in Teams. This enables unique "better together" scenarios between Skype for Business and Teams that enhance the user's experience during coexistence, as well as interoperability scenarios with **Teams Only** users.



IMPORTANT

Meetings First is a better match for organizations who have no or few active Teams chat users. Active Teams chat users should not be switched to Meetings First mode, as they would lose the ability to chat in Teams and to access to their chat history. These users should be grandfathered in **Islands** mode instead, and Meetings First only granted to the users not yet active in chat in Teams.

Who should consider Meetings First?

Meetings First was designed for organizations who use Skype for Business Server with Enterprise Voice who want to accelerate their move to Teams meetings, especially those with strong IT discipline who want a managed, deterministic upgrade path to Teams.

For complex or large organizations, voice migrations are typically done on a site-by-site basis and might take a long time, potentially several years, resulting in extended coexistence scenarios. If that coexistence is in **Islands** mode, users will always have the choice of two meeting solutions (Skype for Business and Teams), which can result in confusing or suboptimal situations. Unlike voice migrations, meetings migrations can generally be completed across the entire company in a short amount of time. Organizations who want to completely switch to Teams meetings as quickly as possible (and without waiting for their voice migration to be complete) should consider Meetings First.

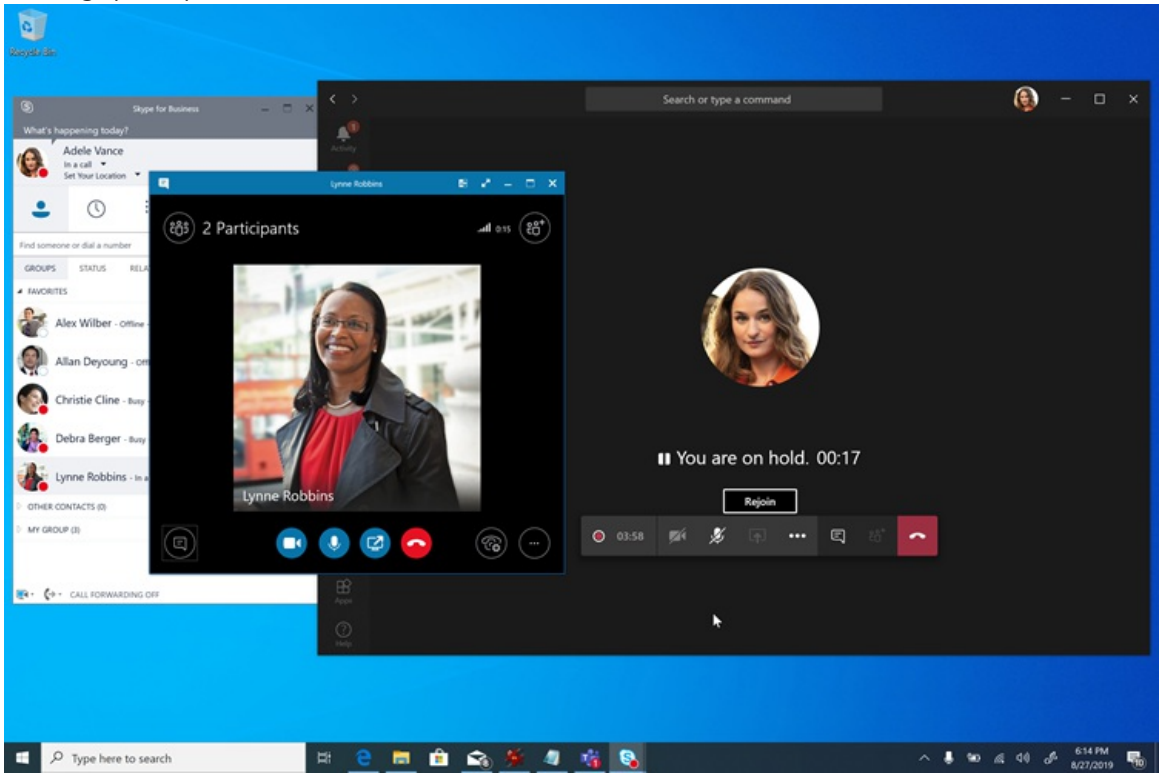
Meetings First might not be useful to organizations who have no Enterprise Voice users. These organizations should be able to upgrade to **Teams Only** as soon as they are able to adopt Teams meetings. They should consider skipping Meetings First.

In addition, Meetings First is useful to organizations whose scope is a pure-play meeting solution, for example when a "meetings-only" RFP is being issued.

Capabilities in Meetings First

Meeting First brings the following capabilities together:

- Provision a Skype for Business Server (on-premises) user with Teams Audio Conferencing.
- Meetings Migration Service: Meetings organized by the user will be migrated to the cloud and converted to Teams meetings as the user is promoted to Meetings First (requires Exchange Online).
- Streamlined user experience in Teams, centered on Teams meetings and teams and channels (which can, optionally, be hidden using the App Permissions policy); Teams private chat, calling, and self-presence are not exposed in Meetings First, enabling the deployment and adoption effort to fully focus on meetings.
- Superior Teams meeting experience.
- "Better Together" between Teams and Skype for Business:
  - Automatic hold: When in a meeting in Teams, getting in a call in Skype for Business will place the Teams meeting on hold, and vice-versa. This prevents users from having their private calls overheard by the meetings participants.



- Presence reconciliation: Activity in Teams is reflected in the user's presence, which is the Skype for Business presence since chat and calling are in Skype for Business. Specifically, when Meetings First users are in a Teams meeting, their presence will be updated to reflect that. When they present their screen, their presence will be updated to show Do Not Disturb (based on their settings in Skype for Business).
- USB device HID control reconciliation (also available on Mac): The HID controls are honored by Teams while in Teams meetings and by Skype for Business in all other circumstances.
- Unless otherwise mentioned, Better Together capabilities require recent Windows desktop clients at this time.

Prerequisites for Meetings First

The only hard requirements for Meetings First are the same as the requirements for Teams with on-premises Active Directory and a Skype for Business on-premises deployment:

- General pre-requisites for Teams, including
- Identity and authentication in Teams and
- Configure Azure Active Directory for Teams and Skype for Business.

A Skype for Business hybrid topology is not required, but it is recommended. Some capabilities such as Meetings Migration Service and interoperability rely on that topology.

Meetings First is supported with any version of the Skype for Business Server (and known to work with the no-longer-supported Lync Server). It is supported with any supported Skype for Business client, however Better Together capabilities require a recent client.

Once these requirements are met (and not prior), the users can be licensed for Microsoft 365 or Office 365 and Teams.

For the best Meetings First experience, users should be enabled for Exchange Online, SharePoint Online, and OneDrive for Business, and Microsoft 365 group creation. Meetings First is supported for users whose mailbox is on Exchange on-premises, or who don't have SharePoint Online or OneDrive For Business, or Microsoft 365 group creation. However, their experience will be less complete. In particular, for organizations using Exchange Server on-premises, there might be (depending on the version of Exchange Server) some limitations to creating and viewing meetings from the Teams client, as well as with respect to compliance capabilities.

At minimum, users must be licensed for Teams. In addition, they can be licensed for Audio Conferencing, if needed.

We recommend you grant **SfBOnly** or **SfBWithTeamsCollab** mode as tenant default at the time you license the users. This ensures users would not start using Teams on their own in the default **Islands** mode prior to you being ready to launch Meetings First.

Meetings First is supported on full desktop clients (Windows and Mac), on browser clients, and on mobile clients. It is also compatible with Microsoft Teams Rooms. Better Together requires the full desktop client.

Prepare for Teams meetings in Meetings First

For your users to have the best possible experience in Teams meetings, you should:

- Follow the steps in Meetings and conferencing for Microsoft Teams, in particular.
- Evaluate your environment.
- Prepare your organization's network for Microsoft Teams.
- Upgrade your meeting rooms with Teams capable meeting room devices and solutions, or use Cloud Video Interop for Microsoft Teams to enable your existing third-party rooms and devices to join Teams meetings.
- Equip your users with certified USB audio and video devices.

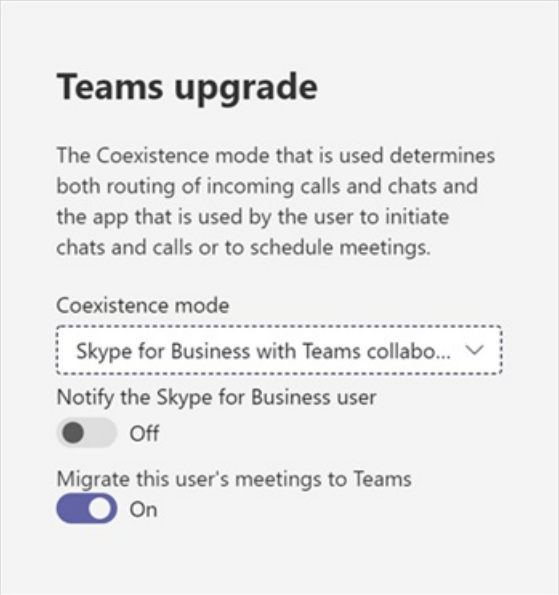
- Prepare to drive awareness and adoption for Teams meetings.
- Plan your service management.
- Familiarize yourself with the rich Call Analytics reports to troubleshoot poor call quality.

You might consider running a moderate scale production ready pilot at this stage.

Configure users for Meetings First

Once you have licensed your users and prepared your organization for Teams meetings, it's time to enable your users for Meetings First. We've made it easy: one single setting will do it all!

All capabilities and user experiences in Meetings First, including the Teams client configuration and auto-conformance of the user experience, Meetings Migration Service, and Better Together capabilities, are configured by granting the user (or group of users, or tenant default) the SfBWithTeamsCollabAndMeetings coexistence mode either in the Microsoft Teams admin center or by using PowerShell.



Optionally, should you want to hide the Teams and Channels application from the left navigation of your users' Teams client to further focus their experience on meetings, that can be achieved by using the App Permission policy.

Reporting and Call Analytics

Reporting and Call Analytics for Teams meetings in Meetings First are unchanged from what they are in other modes.

Related links

After you review this article, you might want to consult Choose your upgrade journey, Migration and interoperability guidance, and Coexistence with Skype for Business for further details.

What is Microsoft 365 Business Voice?

12/5/2020 • 2 minutes to read • Edit Online

Microsoft 365 Business Voice makes it easy for small and medium organizations to turn Microsoft Teams into a powerful and flexible telephone system. It's a replacement for traditional telephony providers and in-house phone systems that can be difficult and costly to manage. You can set up both toll and toll-free numbers, call menus to help callers get to the right department, audio conferencing so you can host meetings with anyone, and more. You can even give people their own phone numbers so they can get calls directly.

Business Voice does all of this by wrapping Microsoft 365 Phone System features into an easy-to-manage bundle. You don't need to worry about choosing the right plan or feature; they're all there and set up for you. Because Phone System is a part of Teams, you can turn any PC, Mac, or mobile device into a phone that can use your Business Voice phone number.

Here's a short video that gives you an overview of Business Voice (2:13 minutes):

Business Voice is right for you if your organization has 300 or fewer people and you have one the following Microsoft 365 subscriptions:

- Microsoft 365 Business Basic
- Microsoft 365 Business Standard
- Microsoft 365 Business Premium
- Microsoft 365 F1
- Microsoft 365 F3
- Office 365 F3
- Microsoft and Office 365 Enterprise E1 or E3
- Microsoft 365 and Office 365 Education A1 or A3
- Microsoft 365 and Office 365 Government G1 or G3
- Microsoft 365 Nonprofit Business Basic
- Microsoft 365 Nonprofit Business Standard
- Microsoft 365 and Office 365 Nonprofit E1 or E3

Business Voice is available in over 70 countries and regions. Whether you can set up Business Voice on your own, transfer phone numbers to Microsoft 365, and manage your phone numbers in Microsoft 365, depends on the country or region in which your Microsoft 365 tenant is located. For more information, check out Country and region availability for Business Voice.

> **IMPORTANT**
>
> Microsoft Teams and Business Voice only work when your users' mailboxes are located in Microsoft 365. They don't support mailboxes located on on-premises Exchange Server.

When you buy Business Voice, you get the following features and more:

Phone System	Standard phone features include Voice Mail, Caller ID, call menus, shared phone lines, and emergency calling.

Domestic Calling	Calls within your country or region are free. International plans and toll-free dialing are also available.
Audio Conferencing	Lets you host conference calls with people who don't have Teams or don't have an internet connection.

You can see everything that's included with Business Voice by visiting Microsoft 365 Business Voice service description.

Country and region availability for Business Voice

7/17/2020 • 3 minutes to read • Edit Online

Microsoft 365 Business Voice is available in over 70 countries and regions. All of the countries and regions in which Business Voice is available are listed in the table later in this article.

Some Business Voice features, specifically Calling Plans and the Getting Started Wizard, are available only in certain countries and regions. Whether these features are available in your tenant's location determines whether you can set up Business Voice on your own, or if you need help from a Microsoft partner or reseller.

In countries and regions **with** support for Calling Plans and the Getting Started Wizard, you can buy Business Voice from Microsoft and then set up or transfer your existing phone numbers to Microsoft. Doing this will let you manage all of your phone numbers in Microsoft 365. After your move to Business Voice is finished:

- Microsoft 365 becomes your telephone provider and domestic local and long distance calls are included in Business Voice. Toll free and international long distance charges are billed directly by Microsoft.
- You no longer need to subscribe to a third-party telephone provider to manage your phone numbers.
- You no longer need any on-premises telephony equipment (other than end-user devices such as desk phones).

If your tenant is located in a country or region that supports Calling Plans and the Getting Started Wizard, check out What do I need to buy to use Microsoft 365 Business Voice with Calling Plan?

In countries and regions **without** support for Calling Plans and the Getting Started Wizard, you need to purchase Business Voice from a Microsoft partner or reseller. After you've purchased Business Voice, you need to then work with your partner or reseller and your third-party telephone provider to set up Direct Routing between your on-premises telephony hardware and Microsoft 365.

- Your telephone provider doesn't change. All local, long distance, and toll-free charges are billed by your existing third-party telephone provider.
- Your telephone provider continues to manage your phone numbers. If you want to add or remove phone numbers, you need to coordinate that change with your telephone provider.
- You need to maintain some on-premises telephone equipment to enable your on-premises telephony equipment (such as desk phones) to communicate with Microsoft 365.

If your tenant is located in a country or region that doesn't support Calling Plans and the Getting Started Wizard, check out Get help from a Microsoft reseller or partner.

To see what's included in Business Voice with Calling Plan and without Calling Plan, see Microsoft 365 Business Voice Service Description.

COUNTRY OR REGION	BUSINESS VOICE WITH CALLING PLAN	BUSINESS VOICE WITHOUT CALLING PLAN (DIRECT ROUTING)	GETTING STARTED WIZARD
Canada	X	X[1]	X
United Kingdom	X	X[1]	X
United States	X	X[1]	X
Argentina		X	

COUNTRY OR REGION	BUSINESS VOICE WITH CALLING PLAN	BUSINESS VOICE WITHOUT CALLING PLAN (DIRECT ROUTING)	GETTING STARTED WIZARD
Australia		X	
Austria		X	
Belgium		X	
Bosnia & Herzegovina		X	
Brazil		X	
Bulgaria		X	
Chile		X	
Colombia		X	
Costa Rica		X	
Croatia		X	
Cyprus		X	
Czech Republic		X	
Denmark		X	
Dominican Republic		X	
Ecuador		X	
Egypt		X	
Estonia		X	
Finland		X	
France		X	
Germany		X	
Greece		X	
Hong Kong SAR		X	
Hungary		X	
Indonesia		X	
Ireland		X	

COUNTRY OR REGION	BUSINESS VOICE WITH CALLING PLAN	BUSINESS VOICE WITHOUT CALLING PLAN (DIRECT ROUTING)	GETTING STARTED WIZARD
Israel		X	
Italy		X	
Japan		X[2]	
Jordan		X	
Kenya		X	
Latvia		X	
Lithuania		X	
Luxembourg		X	
Malaysia		X	
Malta		X	
Mexico		X	
Monaco		X	
Netherlands		X	
New Zealand		X	
Norway		X	
Panama		X	
Paraguay		X	
Peru		X	
Philippines		X	
Poland		X	
Portugal		X	
Puerto Rico		X	
Qatar		X	
Romania		X	
Russia		X	

COUNTRY OR REGION	BUSINESS VOICE WITH CALLING PLAN	BUSINESS VOICE WITHOUT CALLING PLAN (DIRECT ROUTING)	GETTING STARTED WIZARD
Serbia		X	
Singapore		X	
Slovakia		X	
Slovenia		X	
South Africa		X	
South Korea		X	
Spain		X	
Sri Lanka		X	
Sweden		X	
Switzerland		X	
Taiwan		X	
Thailand		X	
Trinidad and Tobago		X	
Turkey		X	
Ukraine		X	
United Arab Emirates		X	
Uruguay		X	
Venezuela		X	
Vietnam		X	

[1] Unless you have specific needs that prevent you from transferring (porting) your phone numbers to Microsoft 365, we recommend that you choose Business Voice with Calling Plan. Business Voice without Calling Plan requires the use of Phone System Direct Routing. Direct Routing has many requirements that may increase the complexity of your deployment and may require the use of a Microsoft partner or consultant.

[2] Business Voice includes the licenses for Phone System and Audio Conferencing. Even though you can't get a Calling Plan through us, you can contact to purchase your licenses and get your phone numbers.

What do I need to buy to use Microsoft 365 Business Voice?

12/5/2020 • 6 minutes to read • Edit Online

Microsoft 365 Business Voice licenses

To make or receive phone calls to or from *external* phone numbers in Microsoft Teams, users need a Microsoft 365 Business Voice license. The license gives them access to all the features that they need to make or receive phone calls, host audio conferences, and more.

Users who don't need to make or receive phone calls to or from external phone numbers just need Teams. They don't need a Microsoft 365 Business Voice license.

For example, you might have 10 factory employees and 5 office employees. The factory employees may only need to call other employees within your company. In addition to calling other employees, office workers also need to make and receive phone calls to and from suppliers, partners, and customers. In this case, only the 5 office workers would need a Microsoft 365 Business Voice license.

Business Voice license types

There are two types of Business Voice licenses: Business Voice **with** Calling Plan and Business Voice **without** Calling Plan. The type of Business Voice license available to you depends on the location of your Microsoft 365 tenant. The license type determines whether you can set up Business Voice on your own, if you need help from a Microsoft partner or reseller, who manages your phone numbers, and so on.

- **Business Voice with Calling Plan** You can buy Business Voice from Microsoft, use the Getting Started Wizard to set up Business Voice, and then set up or transfer your existing phone numbers to Microsoft. The article Use the Getting Started wizard to set up Business Voice shows you how to set up Business Voice for your tenant.

  See Business Voice with Calling Plan later in this article for more information about buying Business Voice with Calling Plan licenses.

- **Business Voice without Calling Plan** You need to buy Business Voice from a Microsoft partner or reseller who will help you set up Business Voice. Your existing phone numbers remain with your current third-party telephone provider. The article Get help from a Microsoft reseller or partner gives you an overview of process needed to set up Business Voice in your tenant.

To see whether your country or region supports Calling Plan, check out Country and region availability for Business Voice.

To learn about Business Voice features, see Microsoft 365 Business Voice service description.

Business Voice with Calling Plan

Business Voice with Calling Plan includes a Domestic Calling Plan, which gives you a certain number of minutes per month to make calls within your country or region. You can purchase an International Calling Plan if you want to make calls to other countries or regions. You use *Communications Credits* to pay for an International Calling Plan, extra minutes per month for a Domestic Calling Plan, and toll-free numbers. You'll learn more about Calling Plans and Communications Credits later in this article.

To buy Microsoft 365 Business Voice with Calling Plan licenses, sign in to the admin center, and then go to **Billing** > **Purchase services**.

Calling Plans

Calling Plans let your users call phone numbers that are outside your organization. Calling Plans include a monthly pool of minutes that's based on the number of assigned Business Voice licenses in a given country or region. When a user makes a phone call, the number of minutes used for that call is deducted from the monthly pool. At the beginning of each month, the balance of minutes in the pool is reset.

Calling Plan pools are specific to the country or region in which the users are located. Users in a country or region can only use minutes from the Calling Plan pool in their country or region. Minutes in a Calling Plan pool in one country or region can't be transferred to a pool in another country or region.

What happens when all the minutes in a Calling Plan pool are used up depends on whether you have Communications Credits available. (We talk about Communications Credits later in this article.) If you have Communications Credits, Business Voice will start using them. If you don't have Credits, users won't be able to make phone call outside your organization until the Calling Plan pool is reset at the beginning of the next month.

> **IMPORTANT**
> The number of minutes in a pool depends on the country or region and the number of Business Voice licenses that are assigned to your users, not the number of Business Voice licenses that you purchased. For example, if you purchased 10 Business Voice licenses in Canada but are only using three licenses, you'll have a total of 9,000 minutes in your pool (3 licenses multiplied by 3,000 minutes per user).

There are two types of Calling Plans:

Domestic Calling Plan

The Domestic Calling Plan lets users call phone numbers in their country or region. Business Voice includes a Domestic Calling Plan for each user who's assigned a Business Voice license. The number of minutes that are available for each user each month depends on country or region the user is located. This table shows the number of minutes for each country or region where Calling Plan is included with Business Voice:

WHERE THE USER IS LOCATED	MONTHLY ALLOTMENT FOR DOMESTIC CALLS
Canada	3,000
United Kingdom	1,200
United States	3,000

Calling Plan isn't included with Business Voice in countries or regions not listed in the preceding table. For a list of all countries and regions in which Business Voice is available, see Business Voice availability.

Calls between the United States and Canada are considered domestic calls. You don't need to add the International Calling Plan to place calls between these two countries.

International Calling Plan

The International Calling Plan lets users call phone numbers outside their country or region. The International Calling Plan is purchased as an add-on.

When you consider whether to buy the International Calling Plan for a user, determine how often they make international calls and how long the calls are. This is important because when you purchase an International Calling Plan, you pay for a certain number of minutes up front. If a user doesn't use up all of the minutes in a month, the remaining minutes are discarded at the beginning of the next month. If it's likely that a user won't use up all the minutes in the International Calling Plan, don't buy one. Instead use Communications Credits (see the following section).

Communications Credits

Communications Credits are like a digital wallet that's used to pay for calls to or from phone numbers outside your phone system. Communications Credits are used in a few situations.

- **A user has run out of minutes in their Domestic or International Calling Plan:** If a user doesn't have an International Calling Plan, Business Voice automatically starts using your Communications Credits balance.
- **A user who doesn't have an International Calling Plan makes international calls:** Business Voice automatically starts using your Communications Credits balance.
- **You have toll-free numbers:** When someone calls your toll-free number, the cost of the call is deducted from your Communications Credit balance.

If you still have Communication Credits left over at the end of the month, they're carried over to the next month.

Buy Communication Credits

We strongly recommend that you always have a minimum balance of Communication Credits so that your users can always make phone calls. The easiest way to make sure you always have an available balance is to set up automatic recharging. With automatic recharging, Microsoft 365 automatically refills your balance when it falls below a minimum. You can choose the minimum and the amount to buy each time. If you'd rather refill your Communication Credits balance manually, you can do that too.

> **IMPORTANT**
>
> Remember that you need Communications Credits if you run out of minutes in your Calling Plans or if you receive toll-free calls. If your Communications Credits balance is empty, you won't be able to receive phone calls on toll-free phone numbers or make calls after the Calling Plan balances are used up.

To learn more about Communication Credits, take a look at What are Communications Credits?

To see rates for toll-free and international calling, scroll down to "Add time with Communication Credits" in Cloud-based Phone System.

Get help from a Microsoft reseller or partner

4/1/2020 • 2 minutes to read • Edit Online

IMPORTANT

The information in this article is applicable to Business Voice **without** Calling Plan only. Before reading this article, check Country and region availability for Business Voice to see whether your country or region supports Business Voice with Calling Plan.

If your tenant is located in a country or region that supports Business Voice with Calling Plan, check out Use the Getting Started wizard to set up Business Voice.

Setting up Business Voice without Calling Plan requires the configuration of Phone System Direct Routing. Direct Routing enables interoperability between your on-premises telephone hardware; Microsoft Phone System, which is the core feature of Business Voice; and your third-party Public Switched Telephone Network (PSTN) provider. Because Direct Routing requires a deep understanding of Microsoft Phone System, PSTN connectivity, networking, and other technical skills, we recommend that you use a Microsoft partner or seller to set it up. Additionally, Business Voice without Calling Plan licenses are only available from Microsoft partners and resellers.

A Microsoft partner or reseller can:

- Obtain the correct Business Voice licenses for your tenant and phone users
- Help you understand the technical requirements for setting up Business Voice
- Coordinate with your telephone provider to make sure your phone numbers are properly set up for use with Business Voice
- Set up communication between your on-premises telephony hardware and Microsoft 365
- Help you set up Business Voice features like Call Queues, Auto Attendant, Voice Mail, and more

When contacting a Microsoft partner or reseller about setting up Business Voice without Calling Plan, you'll need to provide them with information such as:

- How many users, phones, and other devices, will need to make and receive calls to and from external phone numbers
- Details about your existing phone system
- Details about your connection between your phone system and your PSTN provider
- Your Internet connection
- Unique design considerations about your organization such as the need to support call centers, phone system call menus (for example, press 1 for Sales, press 2 for Technical Support), conference rooms, phone kiosks, and so on.
- How many locations your existing phone system supports and how connectivity is set up between them

Check your Internet connection for Business Voice

6/8/2020 • 4 minutes to read • Edit Online

Business Voice is located in the cloud with Microsoft 365. Every device that uses Microsoft Teams and Business Voice needs a connection to the Internet.

To get the best Business Voice experience, you need a broadband Internet connection that can support the maximum number of phone calls that your organization might make at any one time. You also need to make sure that the computers on your network can reach Microsoft 365 servers.

To follow these steps, you need to have a tenant with one of the following subscriptions:

- Microsoft 365 Business Basic
- Microsoft 365 Business Standard
- Office 365 E1
- Office 365 E3
- Office 365 F1
- Microsoft 365 A1
- Microsoft 365 A3
- Microsoft 365 E3
- Microsoft 365 Business

You don't need a Business Voice license to follow these steps.

Check your Internet connection speed

This article helps determine whether your Internet connection is fast enough for the number of people who need to make phone calls and host video conferences. You'll provide information about your organization and get back a report that shows how much of your Internet connection will be used by Teams and Business Voice.

Gather information about your Internet connection and users

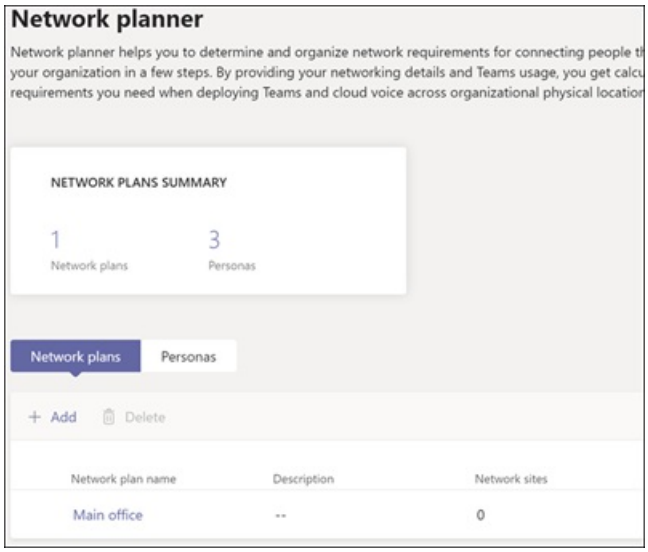
Before you start, you need the following information:

- The speed of your Internet connection
- How many people will use Business Voice mainly from your office
- How many people will use Business Voice mainly from a remote location, such as a home office

Enter your information into the network planner

Follow these steps:

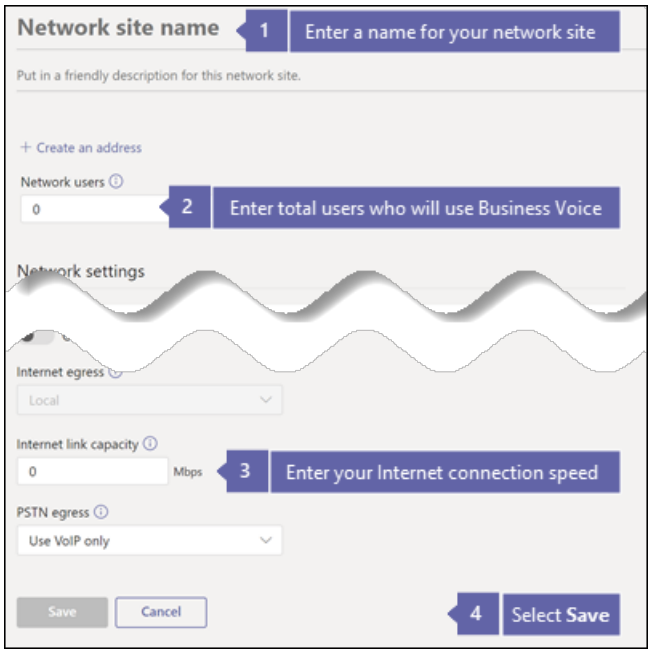
1. In a browser, go to https://admin.teams.microsoft.com. Sign in by using an account that has Global Administrator permissions. The account that you used to sign up for Microsoft 365 or Office 365 has these permissions.
2. Open **Planning** and select **Network planner**.
3. Under **Network plans**, select **Add**. Enter a name for your plan, and then select **Apply**. Your network plan should look like this:



4. Select the name of your network plan. (It's **Main office** in the preceding picture.)

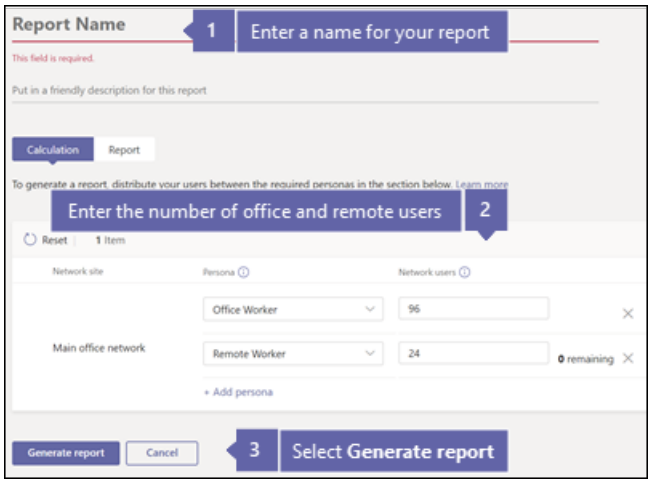
5. On the next page, select **Add a network site** on the **Network sites** tab.

6. Fill in only the fields that are indicated in the following screenshot, and then select **Save**. Leave the other fields on this screen blank, and don't select the **ExpressRoute** or **Connected to WAN** options.



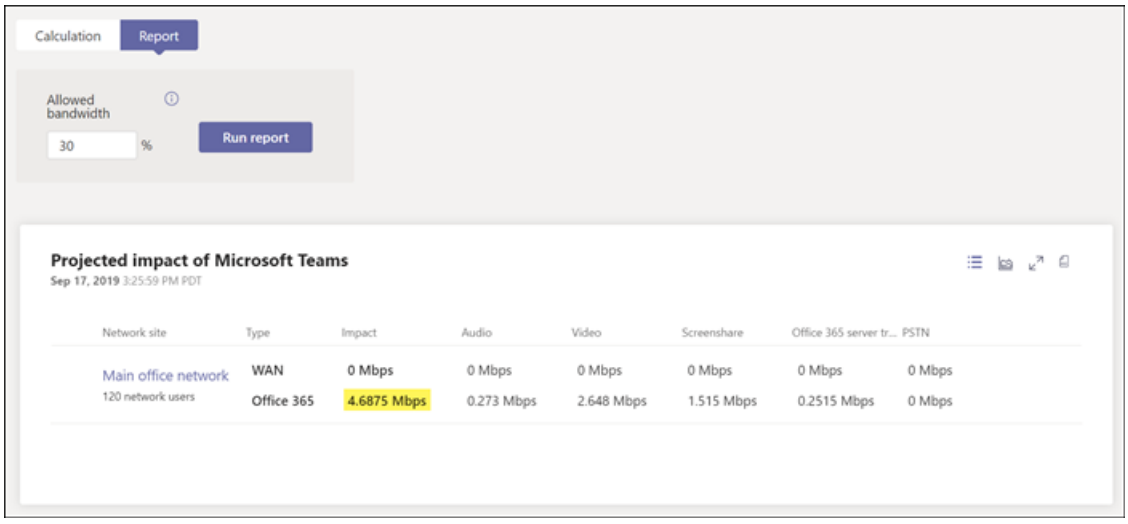
7. On the **Report** tab, select **Start a report**.

8. Enter the following information, and then select **Generate report** to create a report that shows the bandwidth requirements for Teams. We show you how to read the report in the next section.



Find your minimum Internet connection speed

When you select **Generate report**, Microsoft 365 or Office 365 creates a report that looks like this:



The highlighted number shows how much of your Internet connection Teams and Business Voice will use. We recommend that this number is no more than 30 percent of your total Internet connection speed. For example, if your Internet connection is 60 Mbps, Teams and Business Voice should use no more than 18 Mbps.

Use this equation to determine your minimum Internet connection speed: *<highlighted number> / 0.3*. With the number that's highlighted in the preceding image, the calculation is *4.6875 / 0.3 = 15.6*. In this case, the Internet connection speed should be at least 15.6 Mbps.

If Teams and Business Voice will use more than 30 percent of your total Internet connection speed, the highlighted number will appear red. In that case, you may need to upgrade your Internet connection.



Make sure the computers and devices on your network can reach Microsoft 365

Computers and devices that use Business Voice must use specific network ports to communicate with Microsoft 365 servers. These ports are essentially doors through which devices talk to each other over a network or the Internet. Your firewall needs to allow devices on your network to reach Microsoft 365 through the following *outbound* network ports:

- **TCP ports** 80 and 443

- **UDP ports** 3478, 3479, 3480, and 3481

The easiest way to check whether your firewall allows communication on these network ports is to make a test call in Teams:

1. Go to https://aka.ms/getteams on a computer on your network and install Teams. Make sure that the computer has speakers and a microphone.
2. Open Teams and sign in by using a Microsoft 365 account.
3. In Teams, select your profile picture, and then go to **Settings** > **Devices**.
4. Under **Audio devices**, select **Make a test call**.
5. Follow the steps to leave a message and have it played back to you.
    - If the call connects and you hear your message, your firewall is set up correctly.
    - If the call connects, but you can't hear the instructions or your message, make sure that your speakers and microphone are set up correctly, and then try again.
    - If the call doesn't connect or it connects but you can't hear your message, you might need to update your firewall to allow access to the required network ports. Check your firewall's documentation, or contact an IT specialist for help.

If you're an IT professional and want more information about how to prepare larger or more complex networks to support Business Voice, see Evaluate my environment. This article provides information about bandwidth, proxy and firewall requirements, and how to use the Network Assessment Tool to test your network.

How do I get my users ready for Microsoft 365 Business Voice?

2/6/2020 • 3 minutes to read • Edit Online

It's a good idea to get your users ready before you set up Business Voice:

- Make sure that they have Microsoft Teams and Microsoft Office installed.
- Set up any necessary devices on their computers.
- Show them how to set up voicemail greetings and other Business Voice features.
- Encourage them to learn more about Teams so that they get the most out of it.

Install Microsoft Teams on computers and phones

If you haven't already, install Teams on any computers and phones that will be used for Business Voice. Teams is available for PCs and Macs, and for Android and iPhone phones. There's also a web version, at https://teams.microsoft.com. For PCs, Macs, and the web, you need a headset or a microphone and speakers. The next section provides more detail.

For PCs and Macs, you can download Teams at https://teams.microsoft.com/downloads. If a user is running Windows 10 in S mode, they can install Teams from the Windows Store.

For Android and iPhone phones, search for Microsoft Teams in Google Play or Apple App Store. Phones must be running Android 4.4 or later or iOS 10.0 or later. To use Teams on the web, you need to use a supported browser.

Choose devices for Teams and Business Voice

Business Voice users need a microphone and speakers to make and receive phone calls. There are lots of options, depending on the needs of each user or environment. Here are some ideas to think about when you decide what to get:

- **Mobile users or users in noisy environments:** Consider USB or wireless headsets with microphones. Paired with Microsoft Teams, any computer can work as a phone as long as it has an Internet connection.
- **Receptionists and executives:** Full, multi-function desktop handsets can be used, just like with regular phones. Autodial, conferencing, speakerphone, and support for headsets make these devices extremely flexible.
- **Conference rooms:** Audio conferencing devices let you set up conference rooms with speakerphone functionality that can be used with Teams conference bridges to host even large meetings.

If you're using a USB or wireless device, plug the device into a computer that's running Teams. You might need to go into device settings in Teams: Select your profile picture at the top of Teams, and then go to **Settings** > **Devices**. Choose your device from **Audio devices**. If you don't see your device in Teams, follow the manufacturer's instructions to set it up on your computer.

> **NOTE**
>
> To test that Teams, your speakers, and your microphone all work correctly, follow the steps in Make sure your networked devices can reach Microsoft 365.

To see all the devices that Teams supports, visit the Teams Devices store. To purchases devices, contact your local reseller. Most major online stores also carry most Teams devices.

Set up voicemail greetings and other Business Voice features

Just like regular phones, you can set up voicemail greetings and call forwarding, choose ringtones, and more. Everything that can be set up by users can be found in the Teams app by selecting their profile picture in the upper-right corner of Teams and then selecting **Settings** > **Calls**. They can get help with setting up these features by taking a look at Manage your call settings in Teams.

Learn what Microsoft Teams and Business Voice can do

Business Voice can do a lot more than regular phones, too. You can set up simultaneous ring and call groups, share a phone line with a delegate, park calls, make multiple calls at once, and more. Users can see what Teams with Business Voice can do, and learn how to set it up, by taking a look at Meetings and calls.

If users want to know even more about Teams, they can take a look the Microsoft Teams help center.

Use the Getting Started wizard to set up Business Voice

12/5/2020 • 4 minutes to read • Edit Online

IMPORTANT

The information in this article is applicable to Business Voice **with** Calling Plan only. Business Voice with Calling Plan is available only in select countries and regions. Before reading this article, check Country and region availability for Business Voice to see whether your country or region supports Business Voice with Calling Plan.

If your tenant is located in a country or region that doesn't support Business Voice with Calling Plan, check out Get help from a Microsoft reseller or partner.

The Getting Started wizard for Microsoft 365 Business Voice gets you set up quickly to make and receive phone calls in Microsoft Teams. If you're a small business just starting out, the wizard can get you up and running in a few minutes with phone numbers, call menus, greetings, and more. If you're a larger business with an established telephony solution, the wizard can help you set up a pilot so a few users can try Business Voice before you roll it out for everyone. Either way, you can start using Business Voice as soon as the wizard is finished!

It's a good idea to read this article before you start the wizard. When you're ready to run the wizard, select **Get started** on the Get started with Microsoft 365 Business Voice page. Sign in by using the account you used to create your subscription or another account that's a Global Administrator.

IMPORTANT

Microsoft Teams and Business Voice only work when your users' mailboxes are located in Microsoft 365. They don't support mailboxes on on-premises Exchange Server.

The Getting Started Wizard doesn't support Skype for Business hybrid deployments. If you have a Skype for Business hybrid deployment and want to set up Business Voice, check out Set up Phone System in your organization.

If you don't want to customize anything immediately, you're done! You can start using Business Voice right away.

Emergency services location

If you want to change the emergency address, click **Edit**, and then enter a new address. The address that you provide is validated to make sure that it's legitimate and correctly formatted for emergency response services. This address is then assigned to all users that you assign a number to in the next step. If you have employees in more than one location, see Business Voice design customization to add and assign more emergency addresses after you prepare the Getting Started wizard.

For more information, see What are emergency locations, addresses, and call routing?

Company phone number

In addition to a new local phone number, you can purchase a toll-free number or port an existing number to Microsoft 365. To set up a toll-free number, you need to purchase Communications Credits. To port one or more numbers to Microsoft 365, go to the Teams admin center after the wizard finishes.

IMPORTANT

If you port an existing phone number to Microsoft 365, you'll still see a temporary phone number in the wizard. This is expected. After you complete the wizard and the porting process, the temporary phone number will be replaced by the pre-existing number.

User licenses

To assign user licenses, select the people in your organization who need to make or receive phone calls outside of Teams (such as calling a supplier). You can only assign as many Business Voices licenses as you have available. If you need more, you can buy additional licenses after the wizard is finished.

IMPORTANT

You can port existing phone numbers to Microsoft 365 after the wizard is finished. After you complete the porting process, the ported phone numbers will replace the temporary phone numbers that the wizard provided.

Incoming-call greeting

You can upload a sound file (MP3 or WAV) of up to 5 Megabytes (MB) to use as a call greeting, or you can type your greeting, and Microsoft 365 will use text-to-speech to read it to the caller. The greeting will be the first thing callers hear when they call your company phone number. For text-to-speech, you might need to use phonetic spellings to get the pronunciations correct.

Call menu and forwarding

You can forward all calls to a specific user, or you can set up a menu that the caller can choose options from. If you create a call menu, you specify options that the caller can select by voice or by pressing a number on a phone's keypad. Each menu option can forward calls to a specific user.

You can upload a sound file (MP3 or WAV) of up to 5 MB that gives instructions to the caller, or you can type the instructions. Microsoft 365 will use text-to-speech to read them to the caller. You might need to spell words phonetically to get the pronunciations right.

IMPORTANT

The Getting Started wizard helps you set up a simple call menu to get you up and running quickly. If you have multiple phone numbers that you want to set up call menus for or you want to set up more complex call menus (also called auto attendants), see Set up a Cloud auto attendant after you finish the wizard.

The Getting Started wizard takes the information that you enter and sets up Business Voice. On the **Overview** page, you can see what phone numbers are assigned to your users, look at your call menu, listen to your greeting, and more.

Setup takes several minutes. If you select **Done**, we'll continue to set up Business Voice in the background. Or just wait until setup is finished. After it's finished, go to **Voice** in the Teams admin center to set up more Business Voice features.

Things to try after setting up Business Voice

2/6/2020 • 2 minutes to read • Edit Online

Customize Microsoft 365 Business Voice

2/6/2020 • 2 minutes to read • Edit Online

The Getting Started wizard sets up Business Voice with basic options so you can use it right away. Those options might be enough if you're a small business just starting out or if you're running a pilot in your larger organization. You get the basics with new phone numbers and a call menu.

But you'll likely want to customize Business Voice to better meet your business needs. For example, you'll probably want to move your existing phone numbers (called number porting) to Business Voice.

TASK	DESCRIPTION
Move phone numbers to Business Voice	Bring your existing phone numbers to Business Voice.
Set up auto attendants	Add more call menus to expand the options for callers who reach your main phone number.
Set up calling policies	Control whether users can do things like make private calls, use call forwarding, and delegate calls.
Create additional users	Add more users and assign new or existing phone numbers to them.
Set up call queues	Create a queue where callers can wait for the next available agent.

Move (port) phone numbers to Business Voice

4/1/2020 • 2 minutes to read • Edit Online

IMPORTANT

The information in this article is applicable to Business Voice **with** Calling Plan only. Business Voice with Calling Plan is available only in select countries and regions. Before reading this article, check Country and region availability for Business Voice to see whether your country or region supports Business Voice with Calling Plan.

If your tenant is located in a country or region that doesn't support Business Voice with Calling Plan, check out Get help from a Microsoft reseller or partner.

When the Getting Started wizard helps you set up Business Voice, it assigns phone numbers for the main company line and for any users that you've assigned a Business Voice license to. If you already have phone numbers that you want to keep when you move to Business Voice, you can bring them with you by using a process called phone number porting to bring them over to Business Voice. After you port your phone numbers to Business Voice, you assign them to users and services. The old numbers replace the temporary numbers that the Getting Started wizard assigned.

Before you move numbers to Business Voice, take a look at Transferring phone numbers common questions. This article includes answers to questions including what countries and regions are supported, what numbers can and can't be transferred, and what information you'll need.

When you're ready to move your phone numbers to Business Voice, follow the steps in Transfer phone numbers to Office 365 to create a port order. The order includes the information that's needed to move your numbers from your current phone service carrier to Business Voice.

After your phone numbers have been moved to Business Voice, you need to assign them to people. To do that, follow the steps in Change a phone number for a user. When you follow these steps, you'll replace the phone number that was temporarily assigned to the user with their original phone number that you ported over.

If you need help, let us know! We're here to help you get your phone numbers moved to Business Voice as easy as possible. Be sure to include the following information:

- Your organization ID (such as ***contoso***.onmicrosoft.com)
- What types and how many numbers you need help with
- The authorizing person on your account
- A description of the issue or question that you have

For help with phone numbers in Canada and the United States, send your request to ptn@microsoft.com.

For help with phone numbers in Europe, send your request to ptneu@microsoft.com.

Calling policies in Microsoft Teams

2/6/2020 • 3 minutes to read • Edit Online

In Microsoft Teams, calling policies control which calling and call forwarding features are available to users. Calling policies determine whether a user can make private calls, use call forwarding or simultaneous ringing to other users or external phone numbers, route calls to voicemail, send calls to call groups, use delegation for inbound and outbound calls, and so on.

You can use the global (Org-wide default) policy that's created automatically or create and assign custom policies.

Create a custom calling policy

Follow these steps to create a custom calling policy.

1. In the left navigation of the Microsoft Teams admin center, go to **Voice** > **Calling policies**.
2. Select **Add**.
3. Turn on or turn off the features that you want to use in your calling policy.
4. To control whether users can route inbound calls to voicemail, select **Enabled** or **User controlled**. To prevent routing to voicemail, select **Disabled**.
5. Select **Save**.

Edit a calling policy

Follow these steps to edit an existing calling policy.

1. In the left navigation of the Microsoft Teams admin center, select **Voice** > **Calling policies**.
2. Click next to the policy that you want to modify, and then select **Edit**.
3. Make the changes that you want, and then click **Save**.

Assign a custom calling policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Calling policy settings

Here's the settings that you can configure for calling policies.

Make private calls

This setting controls all calling capabilities in Teams. Turn this off to turn off all calling functionality in Teams.

Call forwarding and simultaneous ringing to people in your organization

This setting controls whether incoming calls can be forwarded to other users or can ring another person at the same time.

Call forwarding and simultaneous ringing to external phone numbers

This setting controls whether incoming calls can be forwarded to an external number or can ring an external number at the same time.

Voicemail is available for routing inbound calls

This setting enables inbound calls to be sent to voicemail. Valid options are:

- **Enabled** Voicemail is always available for inbound calls.
- **Disabled** Voicemail is not available for inbound calls.
- **User controlled** Users can determine whether they want voicemail to be available.

Inbound calls can be routed to call groups

> This is a preview or early release feature.

This setting controls whether incoming calls can be forwarded to a call group.

Allow delegation for inbound and outbound calls

> This is a preview or early release feature.

This setting enables inbound calls to be routed to delegates, allowing delegates to make outbound calls on behalf of the users for whom they have delegated permissions. For more information, see Share a phone line with a delegate.

Prevent toll bypass and send calls through the PSTN

Setting this to **On** will send calls through the PSTN and incur charges rather than sending them through the network and bypassing the tolls.

Busy on Busy is available while in a call

Busy on Busy (Busy Options) is a new setting that lets you configure how incoming calls are handled when a user is already in a call or conference or has a call placed on hold. New or incoming calls can be rejected with a busy signal. You can enable busy options at the tenant level or at the user level. Regardless of how their busy options are configured, users in a call or conference or those with a call on hold are not prevented from initiating new calls or conferences. This setting is disabled by default.

Allow web PSTN calling

This setting enables users to call PSTN numbers using the Teams web client.

Allow music on hold

This setting allows you to turn on or turn off music on hold when a PSTN caller is placed on hold. It's turned on by default. This setting doesn't apply to call park and boss delegate features, and is currently only available via PowerShell.

Related topics

Set-CSTeamsCallingPolicy

Assign policies to your users in Teams

Manage policy packages in Microsoft Teams

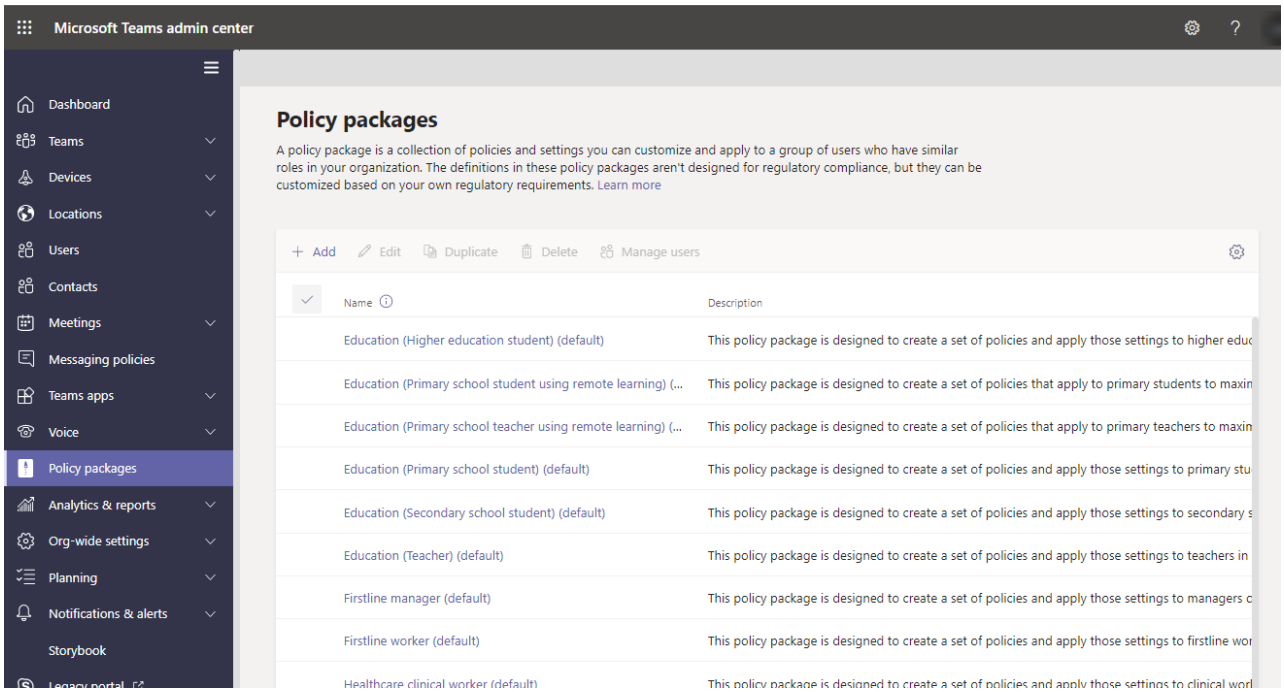
2/6/2020 • 7 minutes to read • Edit Online

NOTE

One of the features discussed in this article, custom policy packages, is currently in private preview.

A policy package in Microsoft Teams is a collection of predefined policies and policy settings that you can assign to users who have similar roles in your organization. We built policy packages to simplify, streamline, and help provide consistency when managing policies for groups of users across your organization.

You can use the policy packages included in Teams or create your own custom policy packages (in private preview).



You can customize the settings of the policies in a policy package to suit the needs of your users. When you change the settings of policies in a package, all users who are assigned to that package get the updated settings. You manage policy packages by using the Microsoft Teams admin center or PowerShell.

What is a policy package?

Policy packages let you control Teams features that you want to allow or restrict for specific sets of people across your organization. Each policy package in Teams is designed around a user role and includes predefined policies and policy settings that support the collaboration and communication activities that are typical for that role.

Policy packages support the following Teams policy types:

- Messaging policy
- Meeting policy
- App setup policy
- Calling policy
- Live events policy

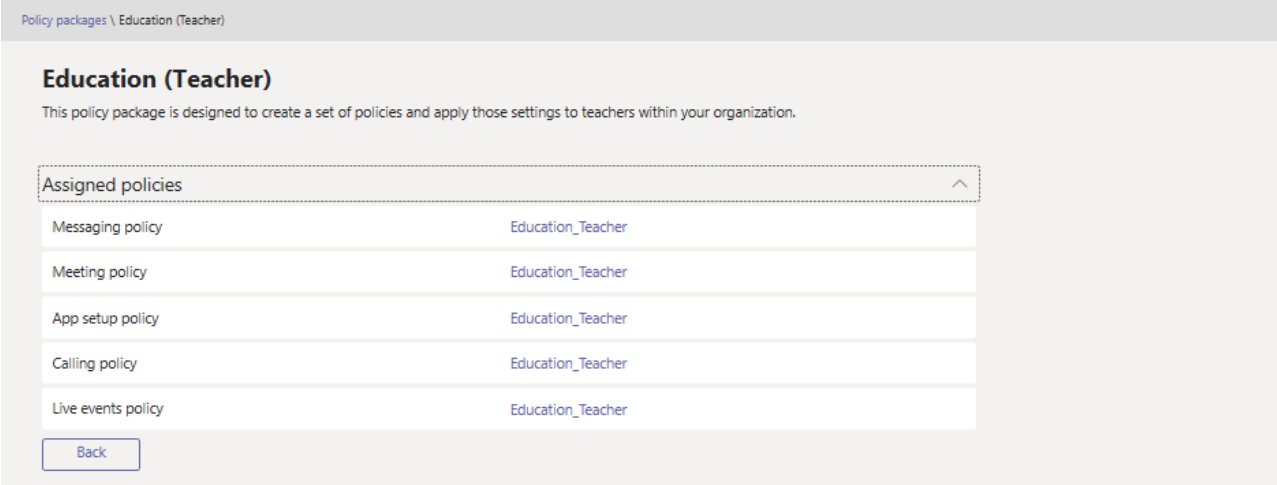
Policy packages included in Teams

Teams currently includes the following policy packages.

PACKAGE NAME	DESCRIPTION
Education (Higher education student)	Creates a set of policies and policy settings that apply to higher education students.
Education (Primary school student)	Creates a set of policies and policy settings that apply to primary students.
Education (Secondary school student)	Creates a set of policies and policy settings that apply to secondary students.
Education (Teacher)	Creates a set of policies and policy settings that apply to teachers.
Education (Primary school teacher using remote learning)	Creates a set of policies that apply to primary teachers to maximize student safety and collaboration when using remote learning.
Education (Primary school student using remote learning)	Creates a set of policies that apply to primary students to maximize student safety and collaboration when using remote learning.
Firstline manager	Creates a set of policies and applies those settings to Firstline Managers in your organization.
Firstline worker	Creates a set of policies and applies those settings to Firstline Workers in your organization.
Healthcare clinical worker	Creates a set of policies and policy settings that give clinical workers such as registered nurses, charge nurses, physicians, and social workers full access to chat, calling, shift management, and meetings.
Healthcare information worker	Creates a set of policies and policy settings that give information workers such as IT personnel, informatics staff, finance personnel, and compliance officers, full access to chat, calling, and meetings.
Healthcare patient room	Creates a set of policies and policy settings that apply to patient rooms in your healthcare organization.
Small and medium business user (Business Voice)	Creates an app setup policy that includes the apps for a business voice experience.
Small and medium business user (without Business Voice)	Creates an app setup policy relevant for a small and medium sized business Teams users (non-Business Voice experience).
Public safety officer	Creates a set of policies and policy settings that apply to public safety officers in your organization.

> **NOTE**
>
> We'll be adding more policy packages in future releases of Teams, so check back for the most up-to-date information.

Each individual policy is given the name of the policy package so you can easily identify the policies that are linked to a policy package. For example, when you assign the Education (Teacher) policy package to teachers in your school, a policy that's named Education_Teacher is created for each policy in the package.



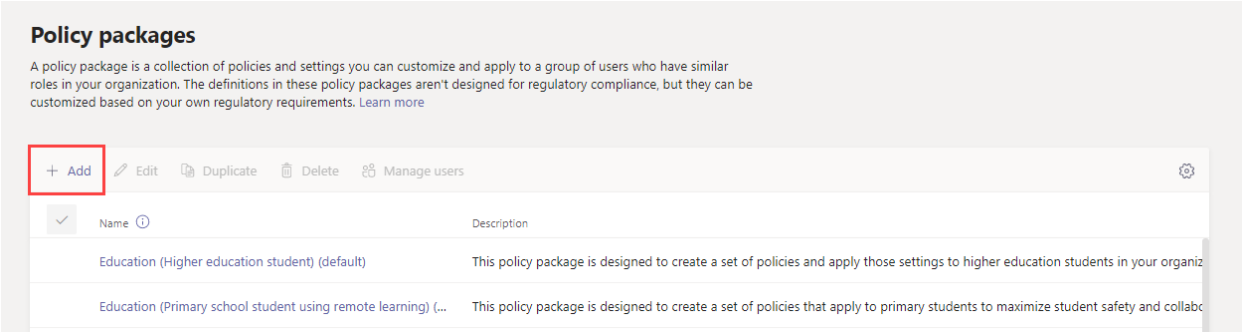
Custom policy packages

This feature is in private preview

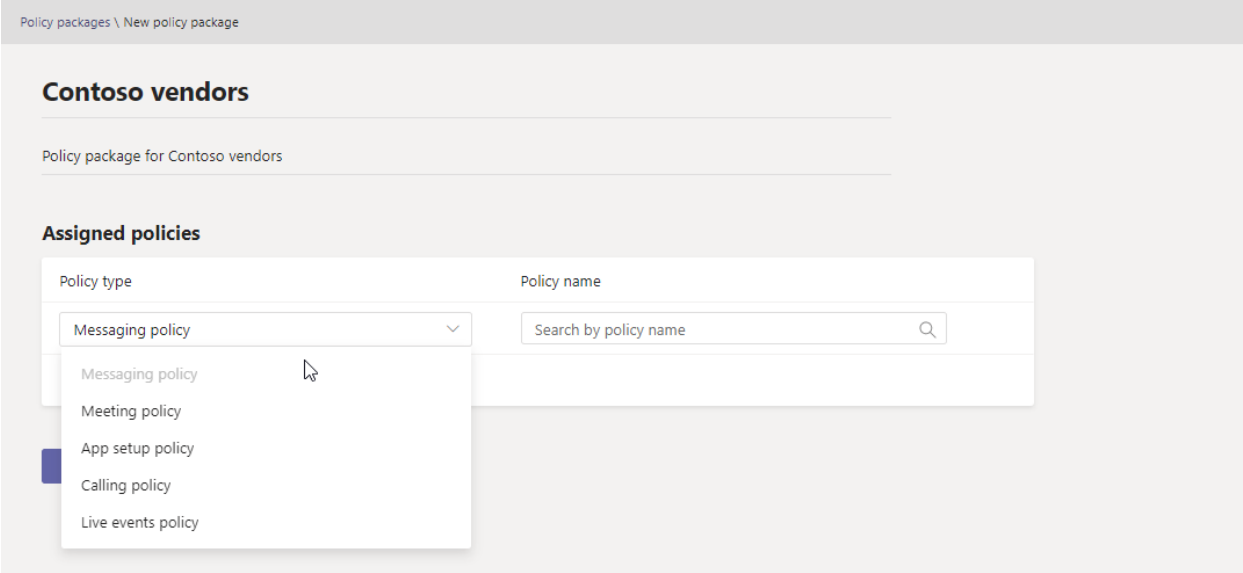
Custom policy packages let you bundle your own set of policies for users with similar roles in you organization. Create your own policy packages by adding the policy types and policies that you need.

To create a new custom policy package:

1. In the left navigation of the Microsoft Teams admin center, select **Policy packages**, and then click **Add**.



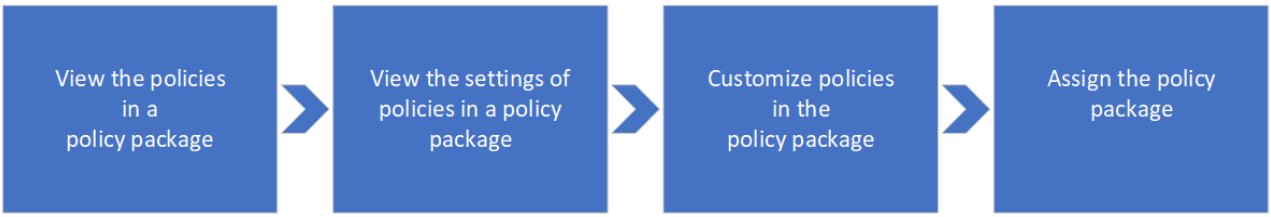
2. Enter a name and description for your package.



3. Select the policy types and policy names to include in the package.
4. Click **Save**.

How to use policy packages

The following outlines how to use policy packages in your organization.



- **View**: View the policies in a policy package. Then, view the settings of each policy in a package before you assign the package. Make sure that you understand each setting. Decide whether the predefined values are appropriate for your organization or whether you need to change them to be more restrictive or lenient based on your organization's needs.

  If a policy is deleted, you can still view the settings but you won't be able to change any settings. A deleted policy is re-created with the predefined settings when you assign the policy package.

- **Customize**: Customize the settings of policies in the policy package to fit the needs of your organization.

- **Assign**: Assign the policy package to users.

> **NOTE**
> You can also change the settings of policies in a policy package after you assign a package. Any changes you make to policy settings are automatically applied to users who are assigned the package.

Here are the steps for how to view, assign, and customize policy packages in the Microsoft Teams admin center.

View the settings of a policy in a policy package

1. In the left navigation of the Microsoft Teams admin center, select **Policy packages**, and then select a policy package by clicking to the left of the package name.
2. Click the policy you want to view.

Customize policies in a policy package

You can edit the settings of a policy through the **Policy packages** page or by going directly to the policy page in

the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, do one of the following:
   - Click **Policy packages**, and then select the policy package by clicking to the left of the package name.
   - Click the policy type. For example, click **Messaging policies**.
2. Select the policy you want to edit. Policies that are linked to a policy package have the same name as the policy package.
3. Make the changes that you want, and then click **Save**.

Assign a policy package

Assign a policy package to one user

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then click the user.
2. On the user's page, click **Policies**, and then next to **Policy package**, click **Edit**.
3. In the **Assign policy package** pane, select the package you want to assign, and then click **Save**.

Assign a policy package to multiple users

1. In the left navigation of the Microsoft Teams admin center, go to **Policy packages**, and then select the policy package you want to assign by clicking to the left of the package name.
2. Click **Manage users**.
3. In the **Manage users** pane, search for the user by display name or by user name, select the name, and then click **Add**. Repeat this step for each user that you want to add.
4. When you're finished adding users, click **Save**.

Assign a policy package to a group

This feature is in private preview

Policy package assignment to groups let you assign multiple policies to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly. This method is recommended for groups of up to 50,000 users but will also work with larger groups.

To learn more, see Assign a policy package to a group.

Assign a policy package to a large set (batch) of users

Use batch policy package assignment to assign a policy package to large sets of users at a time. You use the New-CsBatchPolicyPackageAssignmentOperation cmdlet to submit a batch of users and the policy package that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch.

A batch can contain up to 5,000 users. You can specify users by their object Id, UPN, SIP address, or email address. To learn more, see Assign a policy package to a batch of users.

Troubleshooting

You receive an error when you assign a policy package

This may occur if one or more policies in the package weren't created or applied successfully. Reassign the policy package to your users. Retrying the operation typically fixes this issue.

Related topics

Assign policies to your users in Teams

Teams policy packages for EDU admins

Teams policy packages for healthcare

Teams policy packages for government

Create and license Business Voice users and assign them phone numbers

6/24/2020 • 2 minutes to read • Edit Online

To use Microsoft 365 Business Voice, you need a Microsoft 365 account that has a Microsoft 365 Business Voice license. When you have an account and license, you can assign a phone number to it.

Create and license users

Follow the steps in Add users individually or in bulk and Assign licenses to users.

> **NOTE**
> In the **Assign product licenses** pane, select **Microsoft 365 Business Voice**.

Assign phone numbers to users

After you create users and assigned them a Microsoft 365 Business Voice license, you can assign phone numbers to them. You need one unassigned phone number for each user that needs to make or receive calls to or from external phone numbers. If you don't have enough unassigned phone numbers, see Get more phone numbers later in this article.

1. Go to https://admin.teams.microsoft.com.
2. Enter a name and description for the phone number request.
3. Select **Voice** > **Phone numbers**.
4. Select a phone number that you want to assign to a user, and then select **Edit**.
5. In the **Edit** panel, enter the name of the user that you want to assign the number to in **Assigned to**. Then select **Assign**.
6. For **Emergency location**, enter the location where the user is located, and then select **Apply**

Get more phone numbers

If you don't have enough phone numbers to assign to new users, you can get more. It may take up to 24 hours for numbers that you order to become available.

1. Go to https://admin.teams.microsoft.com.
2. Enter a name and description for the phone number request.
3. Select **Voice** > **Phone numbers** > **Add**.
4. Choose the country or region for the phone number.
5. For **Number type**, select **User (subscriber)**.
6. For **Location**, search for the location of the user and select it. You can also choose to **Add a location**.
7. Choose an area code, enter the number of phone numbers that you need, and then select **Next**.
8. Wait for the phone numbers to be reserved, and then view the numbers that you get. If everything looks ok, select **Place order** and then **Finish**.

Create a call queue

2/6/2020 • 7 minutes to read • Edit Online

Call queues provide a method of routing callers to people in your organization who can help with with a particular issue or question. Calls are distributed one at a time to the people in the queue (who are known as *agents*).

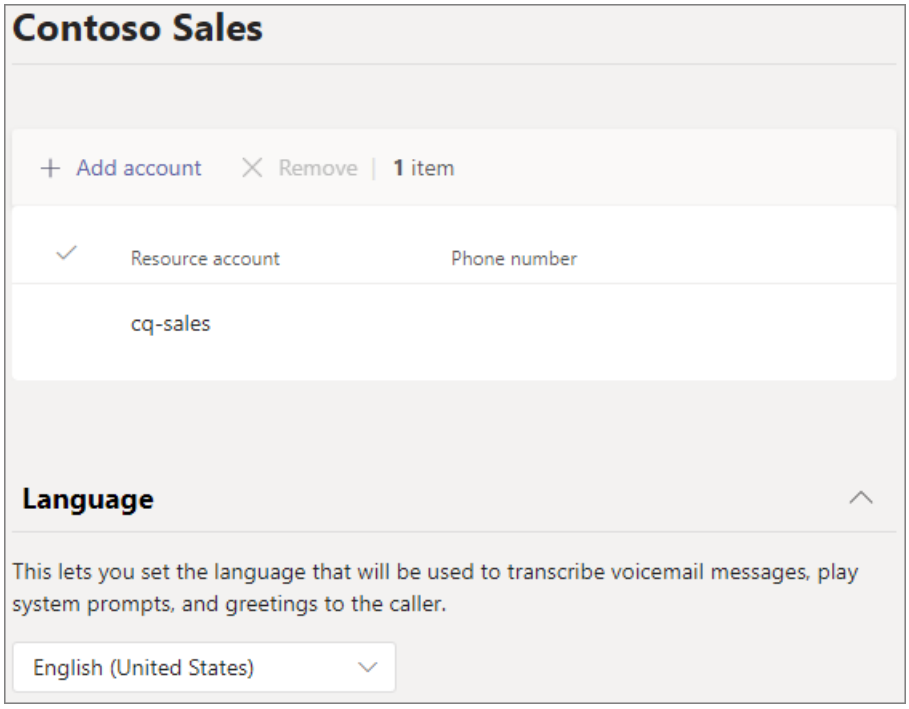
Call queues provide:

- A greeting message.
- Music while people are waiting on hold in a queue.
- Call routing - in *First In, First Out* (FIFO) order - to agents.
- Handling options for queue overflow and timeout.

Be sure you have read Plan for Teams auto attendants and call queues and followed the getting started steps before you follow the procedures in this articles.

To set up a call queue, in the Teams admin center, expand **Voice**, click **Call queues**, and then click **Add**.

Resource account and language



1. Type a name for the call queue. Agents will see this name when they receive an incoming call from the queue.
2. Click **Add accounts**, search for the resource account that you want to use with this call queue, click **Add**, and then click **Add**.
3. Choose a language. This language will be used for system-generated voice prompts and voicemail transcription (if you enable them).

Greetings and music on hold in queue

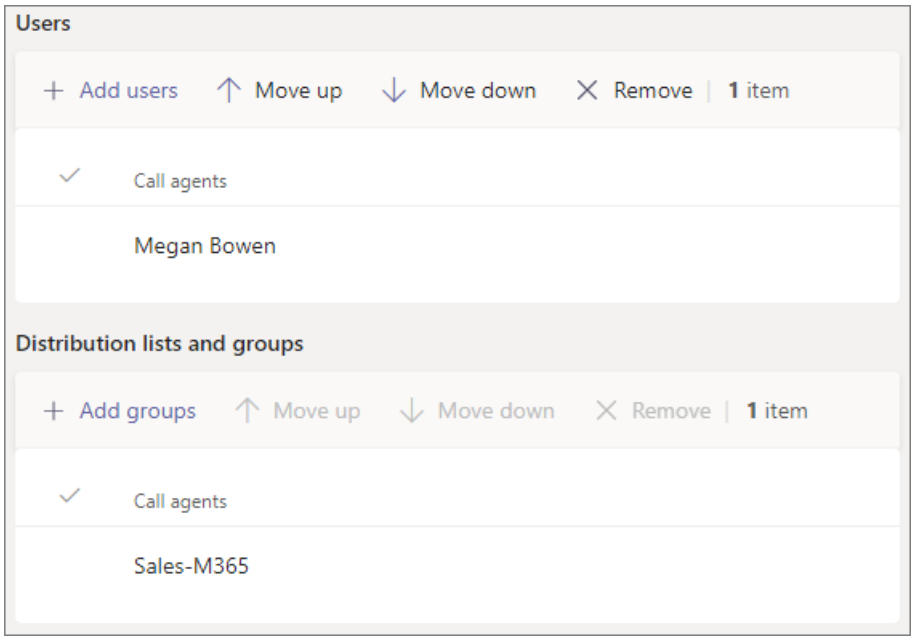
Specify if you want to play a greeting to callers when they arrive in the queue. You must upload an MP3, WAV, or WMA file containing the greeting that you want to play.

Teams provides default music to callers while they are on hold in a queue. If you want to play a specific audio file, choose **Play an audio file** and upload an MP3, WAV, or WMA file.

> **NOTE**
> The uploaded recording can be no larger than 5 MB. The default music supplied in Teams call queues is free of any royalties payable by your organization.

Call agents

Please refer to the Prerequisites in order to be able to add agents to a call queue.



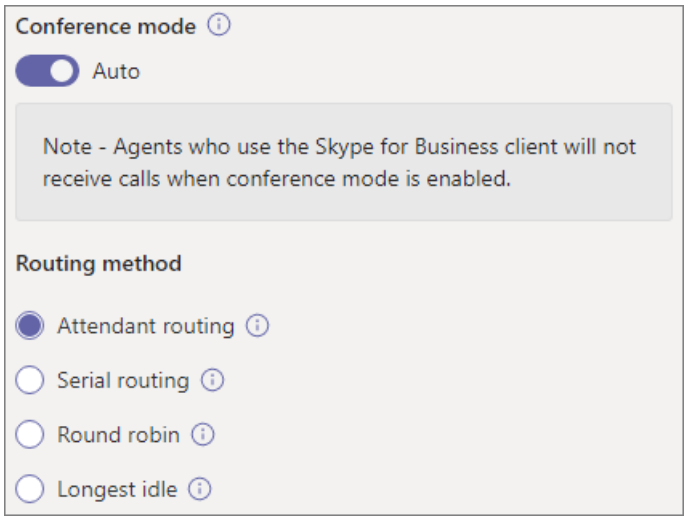
You can add up to 20 agents individually and up to 200 agents via groups.

To add a user to the queue, click **Add users**, search for the user, click **Add**, and then click **Add**.

To add a group to the queue, click **Add groups**, search for the group, click **Add**, and then click **Add**. You can use distribution lists, security groups, and Microsoft 365 groups or Microsoft Teams teams.

> **NOTE**
> New users added to a group can take up to eight hours for their first call to arrive.

Call routing



Conference mode significantly reduces the amount of time it takes for a caller to be connected to an agent, after the agent accepts the call. For conference mode to work, agents in the call queue must use one of the following clients:

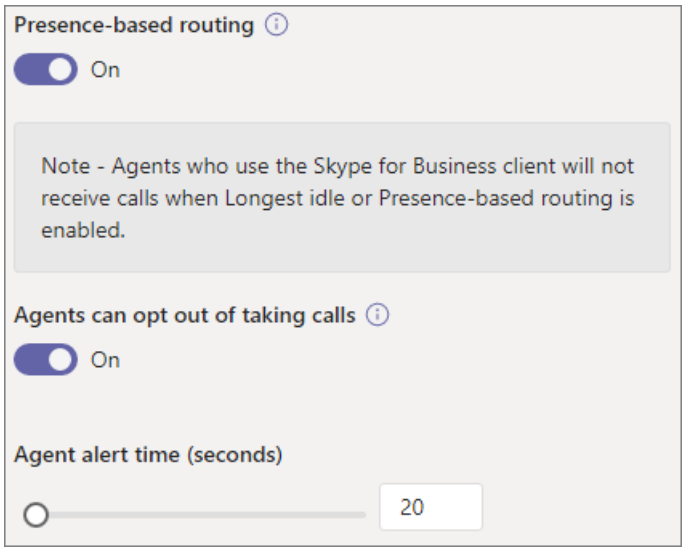
- The latest version of the Microsoft Teams desktop client, Android app, or iOS app
- Microsoft Teams phone version 1449/1.0.94.2020051601 or later

Agents' Teams accounts need to be set to Teams-only mode. Agents who don't meet the requirements aren't included in the call routing list. We recommend enabling conference mode for your call queues if your agents are all using compatible clients.

> **NOTE**
> Busy on Busy is not supported by conference mode. Agents on non-call queue calls may still be presented with a call queue call if presence-based routing is not enabled.

Routing method determines the order in which agents receive calls from the queue. Choose from these options:

- **Attendant routing** rings all agents in the queue at the same time. The first call agent to pick up the call gets the call.
- **Serial routing** rings all call agents one by one in the order specified in the **Call agents** list. If an agent dismisses or does not pick up a call, the call will ring the next agent and will try all agents until it is picked up or times out.
- **Round robin** balances the routing of incoming calls so that each call agent gets the same number of calls from the queue. This may be desirable in an inbound sales environment to assure equal opportunity among all the call agents.
- **Longest idle** routes each call to the agent who has been idle the longest time. An agent is considered idle if their presence state is Available or if their presence state has been Away for less than 10 minutes. Agents whose presence state has been Away for more than 10 minutes are not considered idle and will not be eligible to receive calls until they change their presence to Available.



Presence-based routing uses the availability status of call agents to determine whether an agent should be included in the call routing list for the selected routing method. Call agents whose availability status is set to **Available** are included in the call routing list and can receive calls. Agents whose availability status is set to any other status are excluded from the call routing list and won't receive calls until their availability status changes back to **Available**.

You can enable presence-based call routing with any of the routing methods.

If an agent opts out of getting calls, they won't be included in the call routing list regardless of what their availability status is set to.

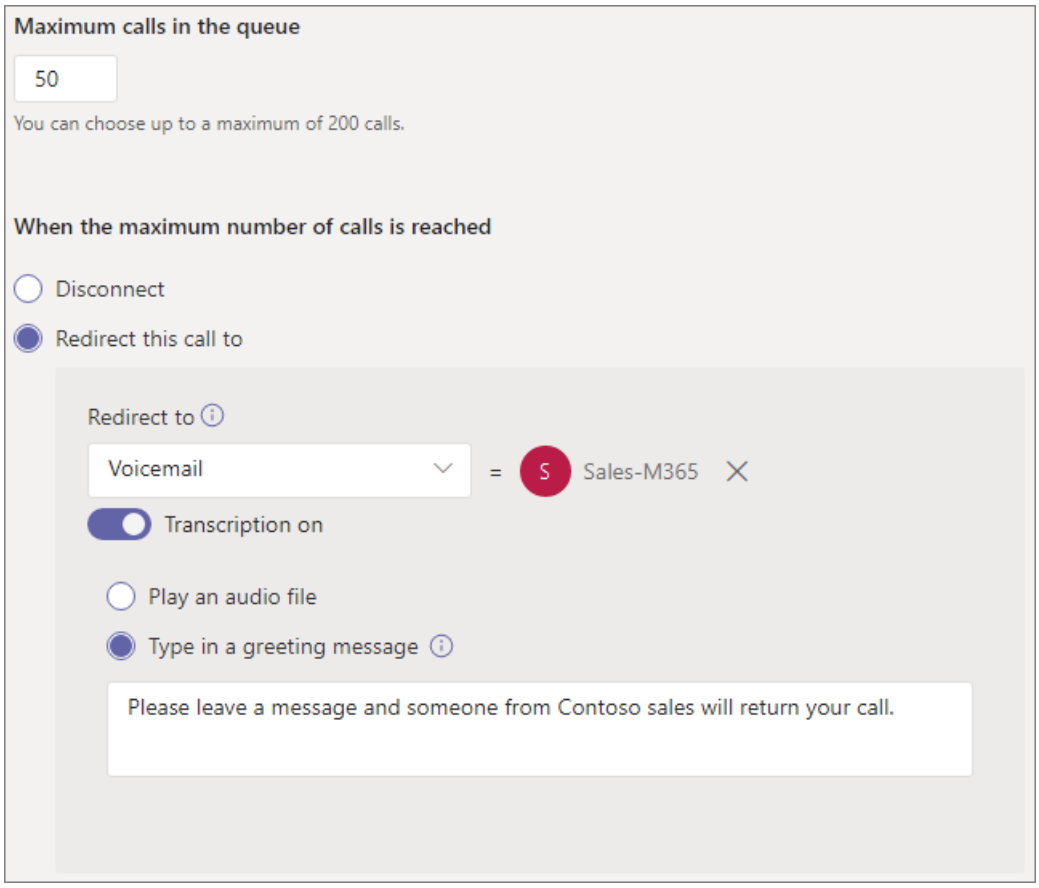
> **NOTE**
> Agents who use the Skype for Business client aren't included in the call routing list when presence-based routing is enabled. If you have agents who use Skype for Business, don't enable presence-based call routing.

Agent alert time specifies how long an agent's phone will ring before the queue redirects the call to the next agent.

For high volume queues, we recommend the following settings:

- **Conference mode** to **Auto**
- **Routing method** to **Attendant routing**
- **Presence-based routing** to **On**
- **Agent alert time:** to **20 seconds**

Call overflow handling

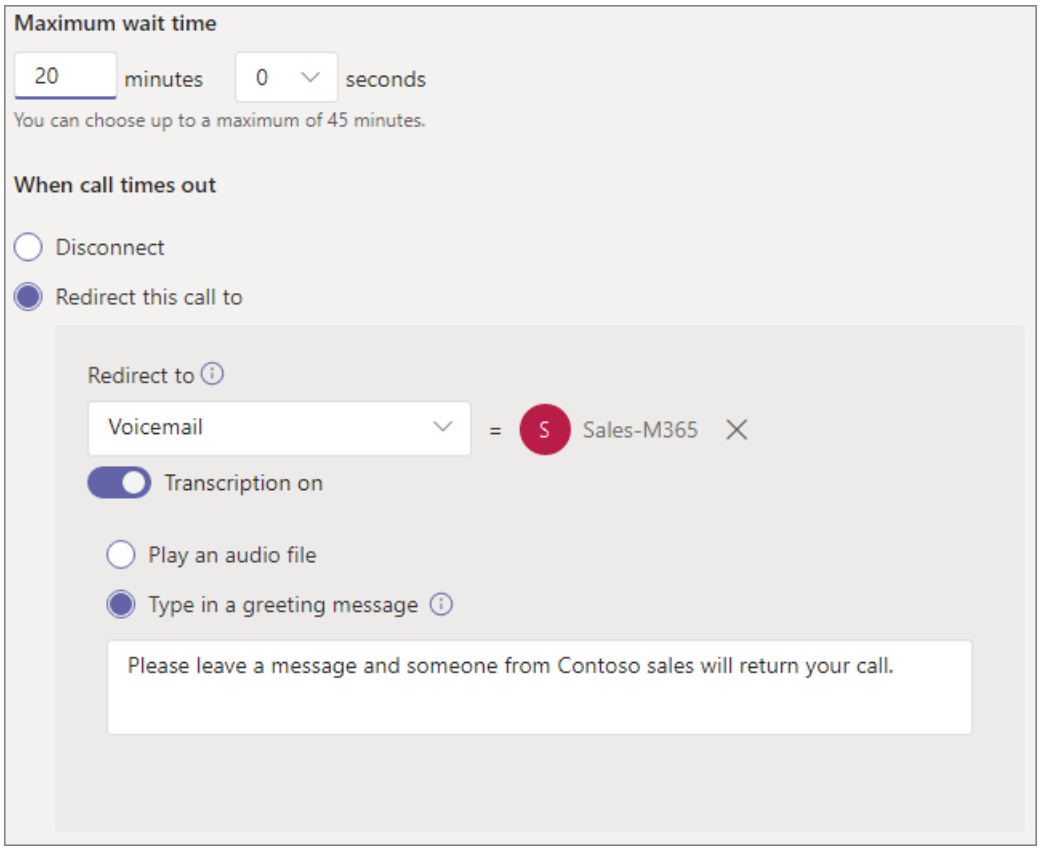


Maximum calls in the queue specifies the maximum number of calls that can wait in the queue at any given time. The default is 50, but it can range from 0 to 200. When this limit is reached, the call is handled as specified by the **When the maximum number of calls is reached** setting.

You can choose to disconnect the call or redirect it to any of the call routing destinations. For example, you might have the caller leave a voicemail for the agents in the queue. For external transfers, please refer to Prerequisites and the external phone number transfers - technical details for number formatting.

> **NOTE**
> If the maximum number of calls is set to 0 then the greeting message will not play.

Call timeout handling



Call Timeout: maximum wait time specifies the maximum time a call can be on hold in the queue before it is redirected or disconnected. You can specify a value from 0 seconds to 45 minutes.

You can choose to disconnect the call or redirect it to one of the call routing destinations. For example, you might have the caller leave a voicemail for the agents in the queue. For external transfers, please refer to Prerequisites and the external phone number transfers - technical details for number formatting.

When you have selected your call timeout options, click **Save**.

Caller ID for outbound calls

Since agents in a call queue may dial out to return a customer call, consider setting the caller ID for members of a call queue to the service number of an appropriate auto attendant. See Manage caller ID policies in Microsoft Teams for more information.

Supported clients

The following clients are supported for call agents in a call queue:

- Skype for Business desktop client 2016 (32-bit and 64-bit versions)
- Lync desktop client 2013 (32-bit and 64-bit versions)
- All IP phone models supported for Microsoft Teams. See Getting phones for Skype for Business Online.
- Mac Skype for Business Client (version 16.8.196 and later)
- Android Skype for Business Client (version 6.16.0.9 and later)
- iPhone Skype for Business Client (version 6.16.0 and later)
- iPad Skype for Business Client (version 6.16.0 and later)
- Microsoft Teams Windows client (32-bit and 64-bit versions)

- Microsoft Teams Mac client
- Microsoft Teams iPhone app
- Microsoft Teams Android app

> **NOTE**
> Call queues that are assigned a direct routing number don't support Skype for Business clients, Lync clients, or Skype for Business IP Phones as agents.

Call queue cmdlets

You can also use Windows PowerShell to create and set up call queues. Here are the cmdlets that you use to manage a call queue.

- New-CsCallQueue
- Set-CsCallQueue
- Get-CsCallQueue
- Remove-CsCallQueue

Related topics

Here's what you get with Phone System

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

New-CsOnlineApplicationInstance

An introduction to Windows PowerShell and Skype for Business Online

Set up an auto attendant

2/6/2020 • 9 minutes to read • Edit Online

Auto attendants let people call your organization and navigate a menu system to speak to the right department, call queue, person, or an operator. You can create auto attendants for your organization with the Microsoft Teams admin center, or with PowerShell.

Be sure you have read Plan for Teams auto attendants and call queues and followed the getting started steps before you follow the procedures in this article.

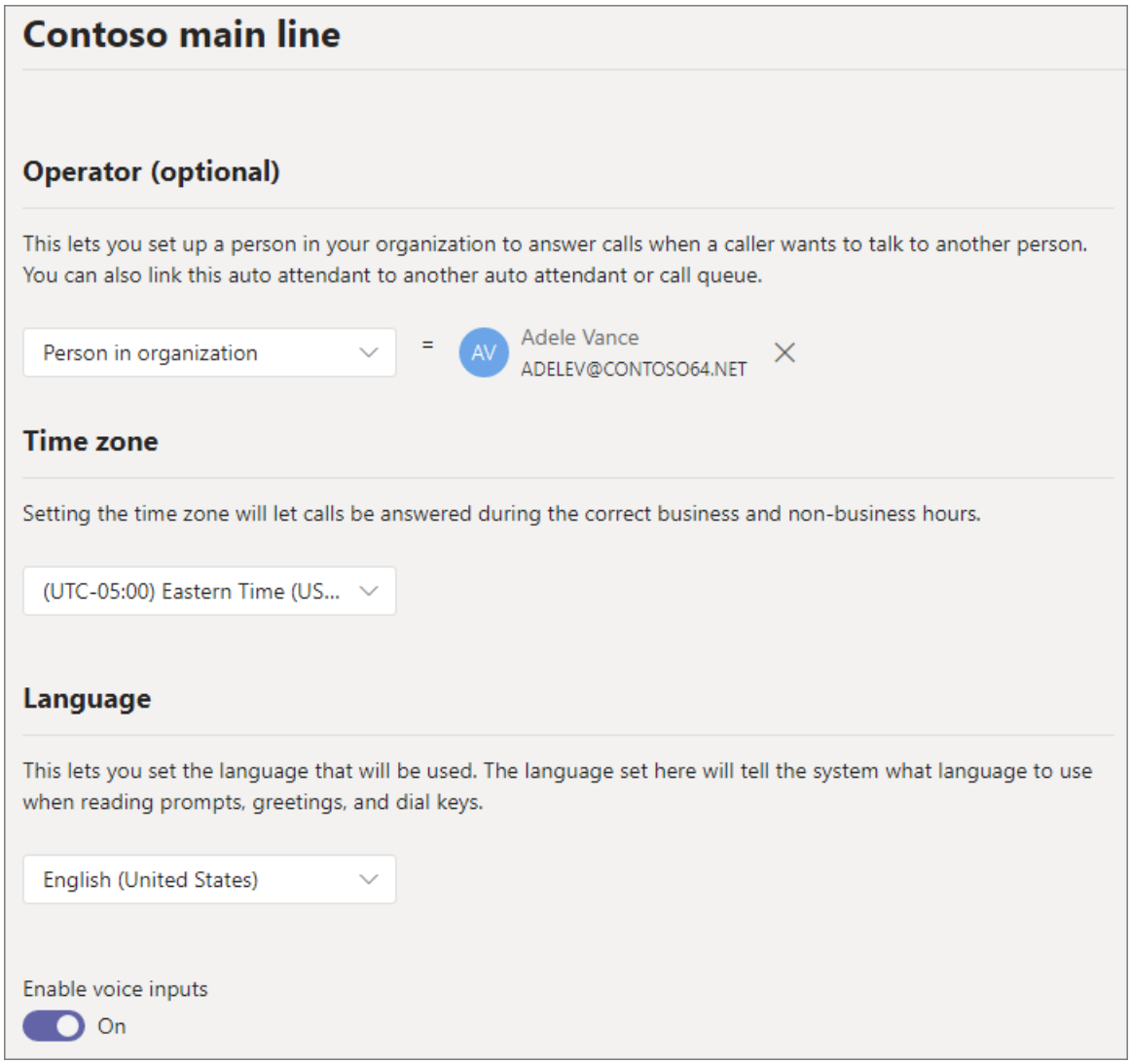
Auto attendants can direct calls, based on callers' input, to one of the following destinations:

- **Person in the organization** - a person in your organization who is able to receive voice calls. This can be an online user or a user hosted on-premises using Skype for Business Server.
- **Voice app** - another auto attendant or a call queue. (Choose the resource account associated with the auto attendant or call queue when choosing this destination.)
- **External phone number** - any phone number. (See external transfer technical details).
- **Voicemail** - the voice mailbox associated with a Microsoft 365 group that you specify.
- **Operator** - the operator defined for the auto attendant. Defining an operator is optional. The operator can be defined as any of the other destinations in this list.

You'll be prompted to choose one of these options at various stages as you set up an auto attendant.

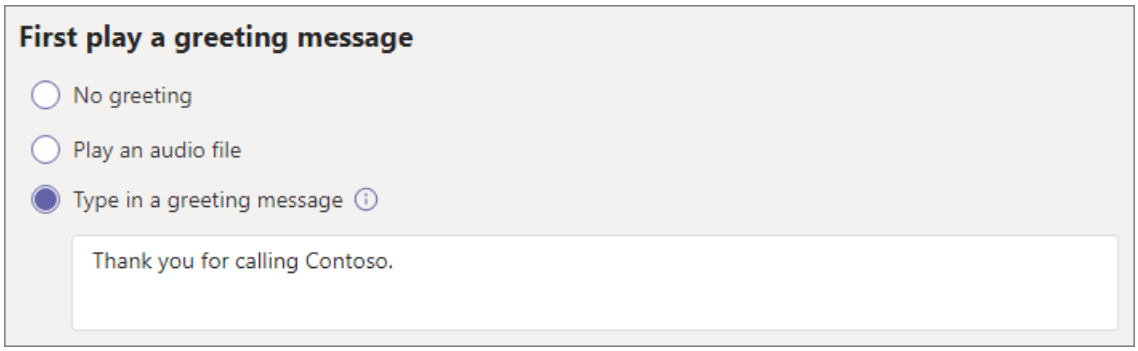
To set up an auto attendant, in the Teams admin center, expand **Voice**, click **Auto attendants**, and then click **Add**.

General info



1. Type a name for the auto attendant in the box at the top.
2. If you want to designate an operator, specify the destination for calls to the operator. This is optional (but recommended). You can set the **Operator** option to allow callers to break out of the menus and speak to a designated person.
3. Specify the time zone for this auto attendant. The time zone is used for calculating business hours if you create a separate call flow for after hours.
4. Specify a language for this auto attendant. This the language that will be used for system-generated voice prompts.
5. Choose if you want to enable voice inputs. When enabled, the name of every menu option becomes a speech-recognition keyword. For example, callers can say "One" to select the menu option mapped to key 1, or they can say "Sales" to select the menu option named "Sales."
6. Click **Next**.

Call flow



Choose if you want to play a greeting when the auto attendant answers a call.

If you select **Play an audio file** you can use the **Upload file** button to upload a recorded greeting message saved as audio in .WAV, .MP3, or .WMA format. The recording can be no larger than 5 MB.

If you select **Type a greeting message** the system will read the text you the text that you type (up to 1000 characters) when the auto attendant answers a call.



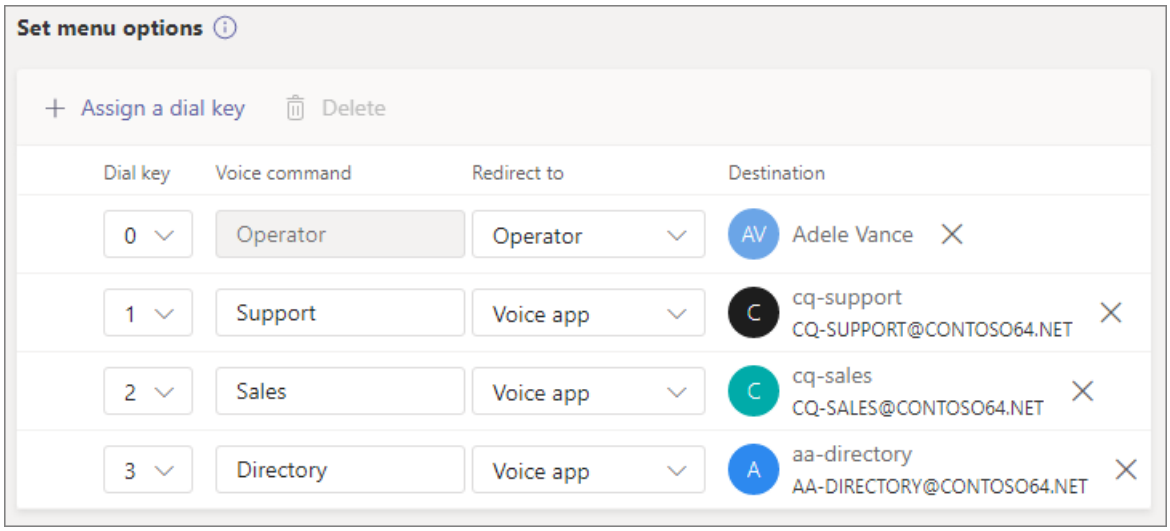
Choose how you want to route the call.

If you select **Disconnect**, the auto attendant will hang up the call.

If you select **Redirect call**, you can choose one of the call routing destinations.

If you select **Play menu options**, you can choose to **Play an audio file** or **Type in a greeting message** and then choose between menu options and directory search.

Menu options



For dialing options, you can assign the 0-9 keys on the telephone keypad to one of the call routing destinations. (The keys * (Repeat) and # (Back) are reserved by the system and can't be reassigned.)

Key mappings don't have to be continuous. It is possible, for example, to create a menu with keys 0, 1, and 3 mapped to options, while the 2 key isn't used.

We recommend mapping the 0 key to the operator if you have configured one. If the operator isn't set to any key, the voice command "Operator" is also disabled.

For each menu option, specify the following:

- **Dial key** - the key on the telephone keypad to access this option. If voice inputs are available, callers can also say this number to access the option.
- **Voice command** - defines the voice command that a caller can give to access this option, if voice inputs are enabled. It can contain multiple words like "Customer Service" or "Operations and Grounds." For example, the caller can press 2, say "two," or say "Sales" to select the option mapped to the 2 key. This text is also rendered by text to speech for the service confirmation prompt, which might be something like "Transferring your call to sales."
- **Redirect to** - the call routing destination used when callers choose this option. If you are redirecting to an auto attendant or call queue, choose the resource account associated with it.

Directory search

If you assign dial keys to destinations, we recommend that you choose **None** for **Directory search**. If a caller attempts to dial a name or extension using keys that are assigned to specific destinations, they may be unexpectedly routed to a destination before they finish entering the name or extension. We recommend that you create a separate auto attendant for directory search and have your main auto attendant link to it via a dial key.

If you didn't assign dial keys, then choose an option for **Directory search**.

Dial by name - If you enable this option, callers can say the user's name or type it on the telephone keypad. Any online user with a Phone System license, or any user hosted on-premises using Skype for Business Server, is an eligible user and can be found with Dial by name. (You can set who is and is not included in the directory on the Dial scope page.)

Dial by extension - If you enable this option, callers can connect with users in your organization by dialing their phone extension. Any online user with a Phone System license, or any user hosted on-premises using Skype for Business Server, is an eligible user and can be found with **Dial by extension**. (You can set who is and is not included in the directory on the Dial scope page.)

Users you wish to make available for Dial By Extension need to have an extension specified as part of one of the following phone attributes defined in Active Directory or Azure Active Directory (See Add users individually or in

bulk for more information.)

- OfficePhone
- HomePhone
- Mobile/MobilePhone
- TelephoneNumber/PhoneNumber
- OtherTelephone

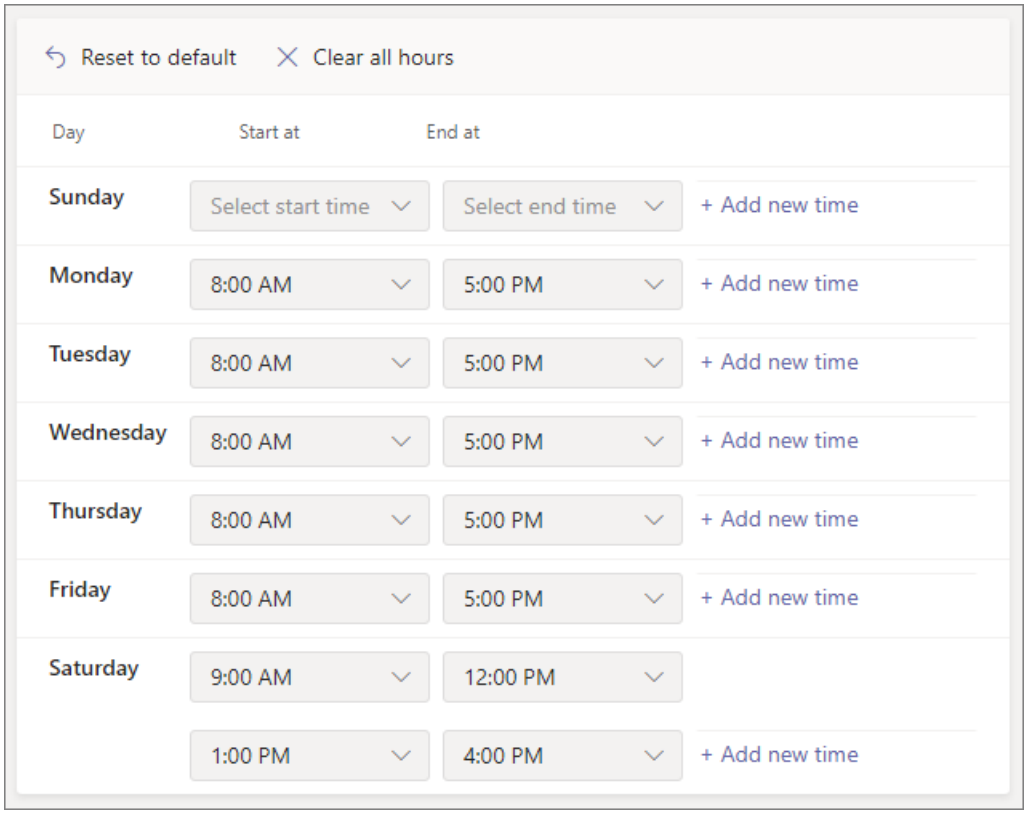
The required format to enter the extension in the user phone number field is either *+<phone number>;ext=<extension>* or *+<phone number>;x<extension>*. Example: Set-MsolUser -UserPrincipalName usern@domain.com -Phonenumber "+15555555678;ext=5678".

You can set the extension in the Microsoft 365 admin center or the Azure Active Directory admin center. It can take up to 12 hours before changes are available to auto attendants and call queues.

> **NOTE**
> If you want to use both the **Dial by name** and **Dial by extension** features, you can assign a dial key on your main auto attendant to reach an auto attendant enabled for **Dial by name**. Within that auto attendant, you can assign the 1 key (which has no letters associated with it) to reach the **Dial by extension** auto attendant.

Once you have selected a **Directory search** option, click **Next**.

Call flow for after hours



Business hours can be set for each auto attendant. If business hours aren't set, all days and all hours in the day are considered business hours because a 24/7 schedule is set by default. Business hours can be set with breaks in time during the day, and all of the hours that are not set as business hours are considered after-hours. You can set different incoming call-handling options and greetings for after-hours.

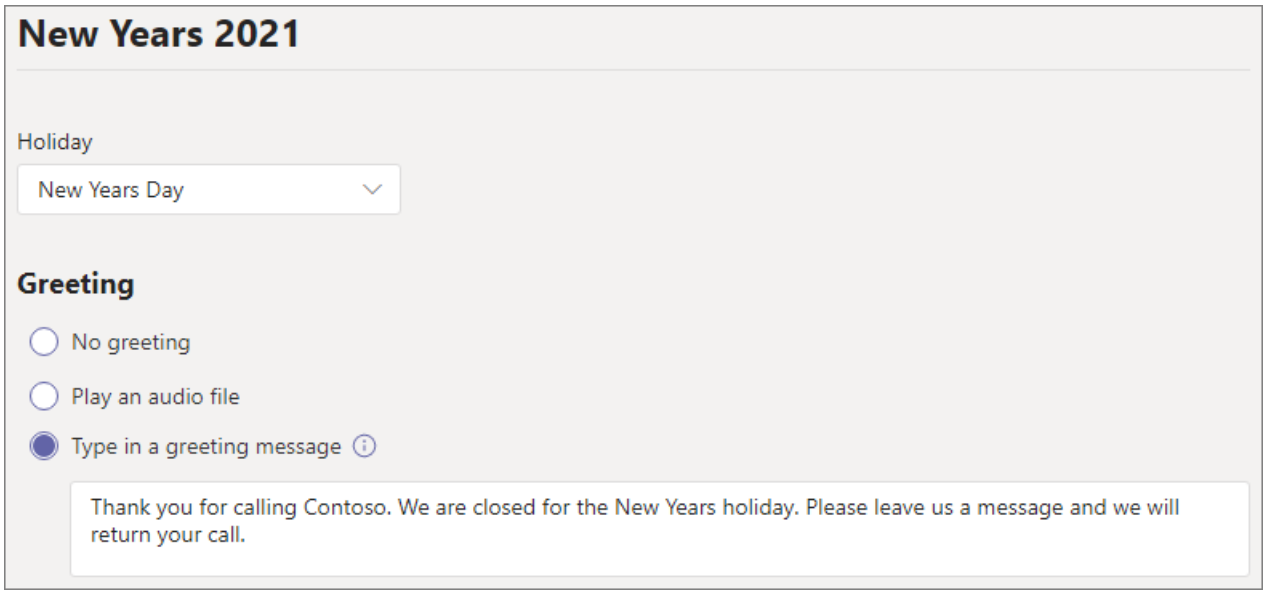
Depending on how you have configured your auto attendants and call queues, you may only need to specify after-hours call routing for auto attendants with direct phone numbers.

If you want separate call routing for after-hours callers, then specify your business hours for each day. Click **Add new time** to specify multiple sets of hours for a given day, for example, to specify a lunch break.

Once you have specified your business hours, then choose your call routing options for after hours. The same options are available as for the business hours call routing that you specified above.

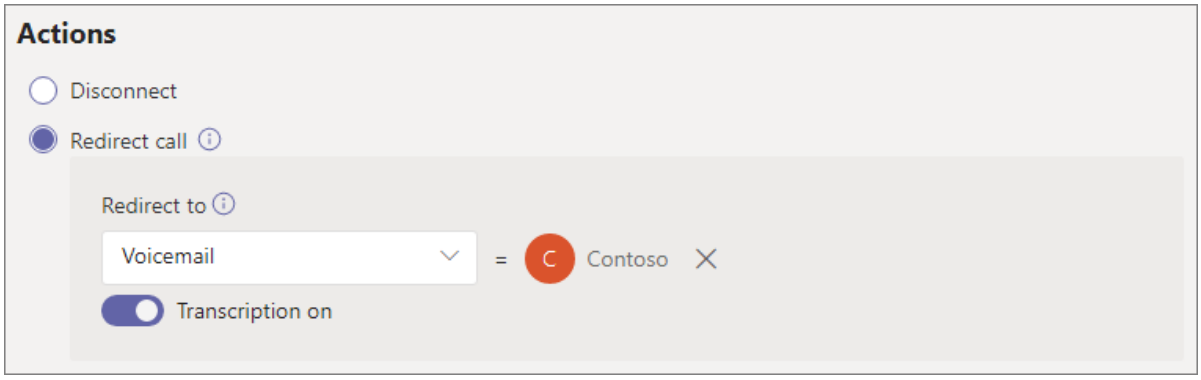
Click **Next** when you're done.

Call flows during holidays

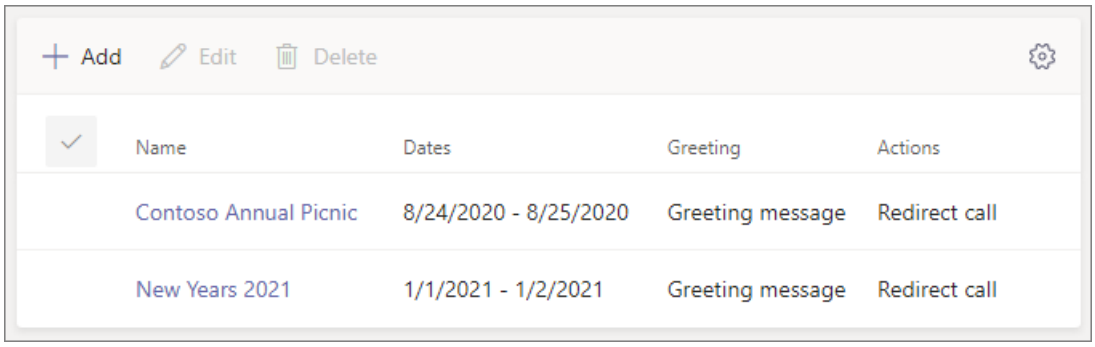


Your auto attendant can have a call flow for each Holiday you've set up. You can add up to 20 scheduled holidays to each auto attendant.

1. On the Holiday call settings page, click **Add**.
2. Type a name for this holiday setting.
3. From the **Holiday** dropdown, choose the holiday that you want to use.
4. Choose the type of greeting that you want to use.



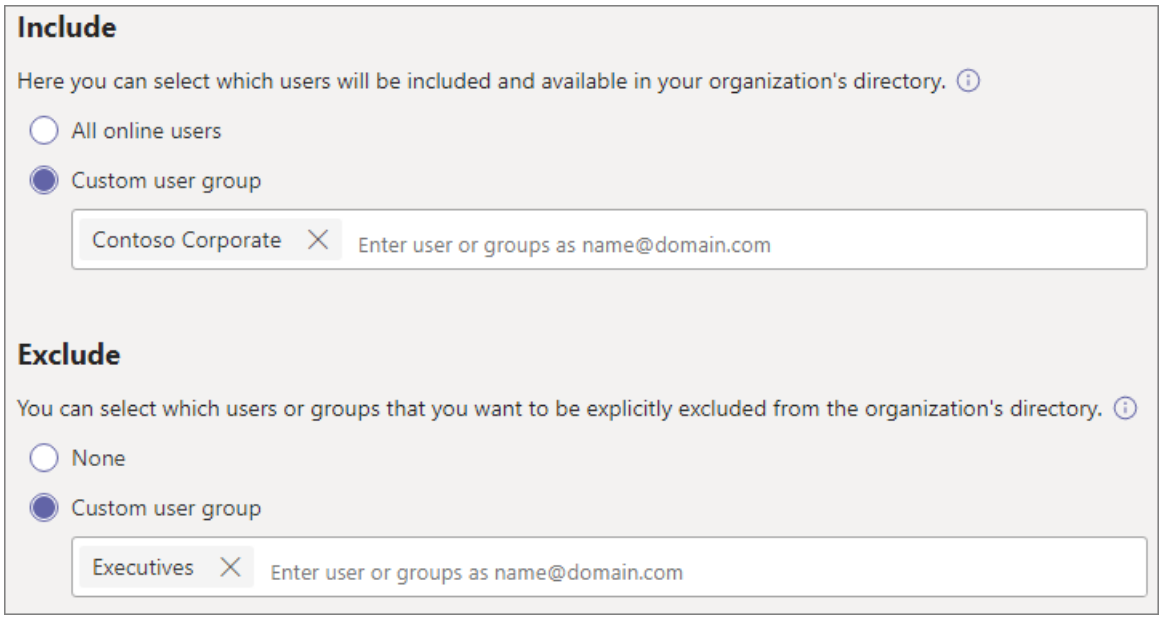
5. Choose if you want to **Disconnect** or **Redirect** the call.
6. If you chose to redirect, choose the call routing destination for the call.
7. Click **Save**.



Repeat the procedure as needed for each additional holiday.

When you've added all your holidays, click **Next**.

Dial scope



The *dial scope* defines which users are available in the directory when a caller uses dial-by-name or dial-by-extension. The default of **All online users** includes all users in your organization that are Online users with a Phone System license or hosted on-premises using Skype for Business Server.

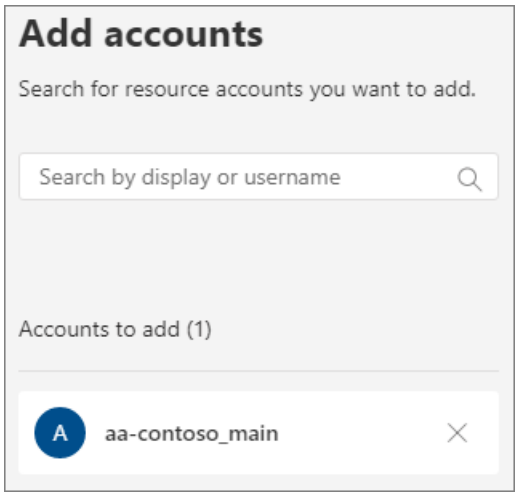
You can include or exclude specific users by selecting **Custom user group** under **Include** or **Exclude** and choosing one or more Microsoft 365 groups, distribution lists, or security groups. For example, you might want to exclude executives in your organization from the dialing directory. (If a user is in both lists, they will be excluded from the directory.)

> **NOTE**
> It might take up to 36 hours for a new user to have their name listed in the directory.

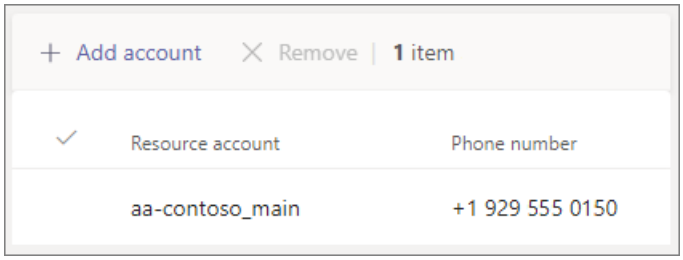
When you're done setting the dial scope, click **Next**.

Resource accounts

All auto attendants must have an associated resource account. First level auto attendants will need at least one resource account that has an associated service number. If you wish, you can assign several resource accounts to an auto attendant, each with a separate service number.



To add a resource account, click **Add account** and search for the account that you want to add. Click **Add**, and then click **Add**.



When you have finished adding service accounts, click **Submit**. This completes the auto attendant configuration.

External phone number transfers - technical details

Please refer to the Prerequisites in order to allow auto attendants to transfer calls externally. In addition:

- For a resource account with a Calling Plan number, the external transfer phone number must be entered in E.164 format (+[country code][area code][phone number]).
- For a resource account with a Direct Routing number, the external transfer phone number format is dependant on the Session Border Controller (SBC) settings.

The outbound phone number that's displayed is determined as follows:

- For Calling Plan numbers, the original caller's phone number is displayed.
- For Direct Routing numbers, the number sent is based on the P-Asserted-Identity (PAI) setting on the SBC, as follows:
  - If set to Disabled, the original caller's phone number is displayed. This is the default and recommended setting.
  - If set to Enabled, the resource account phone number is displayed.

In a Skype for Business hybrid environment, to transfer an auto attendant call to the PSTN, create a new on-premises user with call forwarding set to the PSTN number. The user must be enabled for Enterprise Voice and have a voice policy assigned. To learn more, see Auto attendant call transfer to PSTN.

Create an auto attendant with PowerShell

You can also use PowerShell to create and set up auto attendants. Here are the cmdlets that you need to manage an auto attendant:

- New-CsAutoAttendant
- Set-CsAutoAttendant
- Get-CsAutoAttendant

- Get-CsAutoAttendantHolidays
- Remove-CsAutoAttendant
- New-CsAutoAttendantMenu
- New-CsOnlineAudioFile
- New-CsAutoAttendantCallFlow
- Export-CsAutoAttendantHolidays
- New-CsOnlineTimeRange
- New-CsOnlineDateTimeRange
- New-CsOnlineSchedule
- Get-CsAutoAttendantSupportedTimeZone
- New-CsAutoAttendantCallHandlingAssociation
- Get-CsAutoAttendantSupportedLanguage
- Import-CsAutoAttendantHolidays
- New-CsAutoAttendantCallableEntity

Related topics

Here's what you get with Phone System

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Small business example — Set up an auto attendant

An introduction to Windows PowerShell and Skype for Business Online

Create and license Business Voice users and assign them phone numbers

6/24/2020 • 2 minutes to read • Edit Online

To use Microsoft 365 Business Voice, you need a Microsoft 365 account that has a Microsoft 365 Business Voice license. When you have an account and license, you can assign a phone number to it.

Create and license users

Follow the steps in Add users individually or in bulk and Assign licenses to users.

> **NOTE**
> In the **Assign product licenses** pane, select **Microsoft 365 Business Voice**.

Assign phone numbers to users

After you create users and assigned them a Microsoft 365 Business Voice license, you can assign phone numbers to them. You need one unassigned phone number for each user that needs to make or receive calls to or from external phone numbers. If you don't have enough unassigned phone numbers, see Get more phone numbers later in this article.

1. Go to https://admin.teams.microsoft.com.
2. Enter a name and description for the phone number request.
3. Select **Voice** > **Phone numbers**.
4. Select a phone number that you want to assign to a user, and then select **Edit**.
5. In the **Edit** panel, enter the name of the user that you want to assign the number to in **Assigned to**. Then select **Assign**.
6. For **Emergency location**, enter the location where the user is located, and then select **Apply**

Get more phone numbers

If you don't have enough phone numbers to assign to new users, you can get more. It may take up to 24 hours for numbers that you order to become available.

1. Go to https://admin.teams.microsoft.com.
2. Enter a name and description for the phone number request.
3. Select **Voice** > **Phone numbers** > **Add**.
4. Choose the country or region for the phone number.
5. For **Number type**, select **User (subscriber)**.
6. For **Location**, search for the location of the user and select it. You can also choose to **Add a location**.
7. Choose an area code, enter the number of phone numbers that you need, and then select **Next**.
8. Wait for the phone numbers to be reserved, and then view the numbers that you get. If everything looks ok, select **Place order** and then **Finish**.

Manage your devices in Microsoft Teams

5/19/2020 • 4 minutes to read • Edit Online

You can manage devices used with Microsoft Teams in your organization from the Microsoft Teams admin center. You can view and manage the device inventory for your organization and do tasks such as update, restart, and monitor diagnostics for devices. You can also create and assign configuration profiles to a device or groups of devices.

To manage devices, such as change device configuration, restart devices, manage updates, or view device and peripheral health, you need to be assigned one of the following Microsoft 365 admin roles:

- Microsoft 365 Global admin
- Teams Service admin
- Teams Device admin

For more information about admin roles in Teams, see Use Teams administrator roles to manage Teams.

What devices can you manage?

You can manage any device that's certified for, and enrolled in, Teams. A device is automatically enrolled the first time a user signs in to Teams on the device. For a list of certified devices that can be managed, see:

- Microsoft Teams Rooms
- Conference phones
- Desk phones
- Teams displays
- Collaboration bars

To manage devices, in the left navigation of the Microsoft Teams admin center, go to **Devices**, and then select the device type. Each type of device has its own respective section, which lets you manage them separately.

Manage Teams Rooms devices

You can use the Teams admin center to view and remotely manage your Teams Rooms devices across your organization. The Teams admin center makes it easy to see, at a glance, which devices are healthy and which need attention, and lets you focus on specific devices to see detailed information about device health, meeting performance, call quality, and peripherals.

Here are some things you can do to manage your Teams Rooms devices. Teams Rooms devices can be found in the Microsoft Teams admin center under **Devices** > **Teams Rooms**.

For details about how to manage your Teams Rooms devices, see Manage Microsoft Teams Rooms.

TO DO THIS...	DO THIS
Change settings on one or more devices	Select one or more devices > **Edit settings**. If you select multiple devices, the values you change will replace the values on all the selected devices.

TO DO THIS...	DO THIS
Restart devices	Select one or more devices > **Restart**. When you restart a device, you can choose whether to restart the device immediately or select **Schedule restart** to restart the device at a specific date and time. The date and time you select are local to the device being restarted.
View meeting activity	Select a device name to open device details > **Activity**. When you open the **Activity** tab, you can see all the meetings that the device has participated in. This summary view shows the meeting start time, the number of participants, its duration, and the overall call quality.
View meeting details	Select a device name to open device details > **Activity** > select a meeting. When you open a meeting's details, you can see all of the participants in the meeting, how long they were in the call, the Teams session types, and their individual call quality. If you want to see technical information about a participant's call, select the participant's call start time.

Manage phones, collaboration bars, and Teams displays

In the Teams admin center, you can view and manage phones, collaboration bars, and Teams displays enrolled in Teams in your organization. Information that you'll see for each device includes device name, manufacturer, model, user, status, action, last seen, and history. You can customize the view to show the information that fits your needs.

Phones, collaboration bars, and Teams displays are automatically enrolled in Microsoft Intune if you've signed up for it. After a device is enrolled, device compliance is confirmed and conditional access policies are applied to the device.

Here are some examples of how you can manage phones, collaboration bars,and Teams displays in your organization.

TO DO THIS...	DO THIS
Change device information	Select a device > **Edit**. You can edit details such as device name, asset tag, and add notes.
Manage software updates	Select a device > **Update**. You can view the list of software and firmware updates available for the device and choose the updates to install. For more information about updating devices, see Update Teams devices remotely
Upgrade Teams phones to Teams displays	On the **IP phones** page, select one or more Teams phones > **Upgrade**. This option is available only to phones that support upgrading to Teams displays. To learn more, see Upgrade Teams phones to Teams displays.
Assign or change configuration policies	Select one or more devices > **Assign configuration**.
Add or remove device tags	Select one or more devices > **Manage tags**. For more information about device tags, see Manage Teams device tags.
Restart devices	Select one or more devices > **Restart**.

TO DO THIS...	DO THIS
Filter devices using device tags	Select the filter icon, select the **Tag** field, specify a device tag to filter on, and select **Apply**. For more information about filtering devices using device tags, see Use filters to return devices with a specific tag.
View device history	Select a device > **History**. You can view the update history for the device.
View diagnostics	Select a device > **Diagnostics**.

Use configuration profiles in Teams

Use configuration profiles to manage settings and features for Teams phones and collaboration bars in your organization. You can create or upload configuration profiles to include settings and features you want to enable or disable and then assign a profile to a device or groups of devices.

Create a configuration profile

1. In the left navigation, go to **Devices** > **Configuration profiles**.
2. Click **Add**.
3. Enter a name for the profile and if you want, add a friendly description.
4. Specify the settings you want for the profile, and then click **Save**.

Assign a configuration profile

1. In the left navigation, go to **Devices** > **Configuration profiles**.
2. Select the **Configuration profile** you want to assign, and then click **Assign to device**.
3. In the **Assign devices to a configuration profile** pane, search for and select the devices you want to assign.
4. Click **Save**.

Monitor and improve call quality for Microsoft Teams

7/8/2020 • 2 minutes to read • Edit Online

This article introduces three key tools you can use to monitor, troubleshoot, manage, and improve call quality in Microsoft Teams.

- **Call Quality Dashboard (CQD)**: To analyze org-wide trends or problems, drive improvements to performance
- **Call analytics**: To analyze call and meeting quality for individual users
- **Quality of Service (QoS)**: To prioritize important network traffic

Monitor and troubleshoot call quality

You'll use per-user **Call analytics** and **Call Quality Dashboard** to find and troubleshoot call-quality problems that come up during ongoing operation. This lets you drive performance improvements across your network. Both of these tools are in the Teams admin center.

- **Call analytics** shows detailed information about the devices, networks, and connectivity related to ***specific calls and meetings*** for each user in Teams. Teams admin and helpdesk agents will use this information to troubleshoot call quality and connection problems in a specific call. To learn more, read Set up call analytics and Use Call Analytics to troubleshoot poor call quality.
- **Call Quality Dashboard (CQD)** gives you a ***network-wide view*** of call quality across your organization. Use CQD information to help you identify and fix problems. First, Set up CQD. Then read Manage call and meeting quality in Teams.

Call analytics and CQD run in parallel and can be used independently or together. For example, if a communications support specialist determines that they need more help troubleshooting a user's call problem, they escalate the call to a communications support engineer, who has access to additional information about the call. In turn, the communications support engineer alerts a network engineer to a possible site-related issue they noticed in the call analytics. The network engineer checks CQD to see if an overall site-related issue could be a contributing cause of the user's call problem.

Prioritize important network traffic using QoS

As your users start using Teams for calls and meetings, they may experience a caller's voice breaking up or cutting in and out of a call or meeting. Shared video may freeze or pixelate, or fail altogether. This is due to the IP packets that represent voice and video traffic encountering network congestion and arriving out of sequence or not at all. If this happens (or to prevent it from happening in the first place), use **Quality of Service (QoS)**.

With QoS, you prioritize delay-sensitive network traffic (for example, voice or video streams), allowing it to "cut in line" in front of traffic that is less sensitive (like downloading a new app, where an extra second to download isn't a big deal). QoS identifies and marks all packets in real-time streams using Windows Group Policy Objects and a routing feature called Port-based Access Control Lists, which instructs your network to give voice, video, and screen sharing their own dedicated network bandwidth.

Ideally, you'll implement QoS on your internal network while getting ready to roll out Teams, but you can do it anytime. If you're small enough, you might not need QoS.

When you're ready, read Implement Quality of Service (QoS) in Microsoft Teams.

To use QoS to manage meeting traffic, read Set how you want to handle real-time media traffic for Teams meetings.

Related Topics

Set up call analytics

Use Call Analytics to troubleshoot poor call quality

Set up CQD

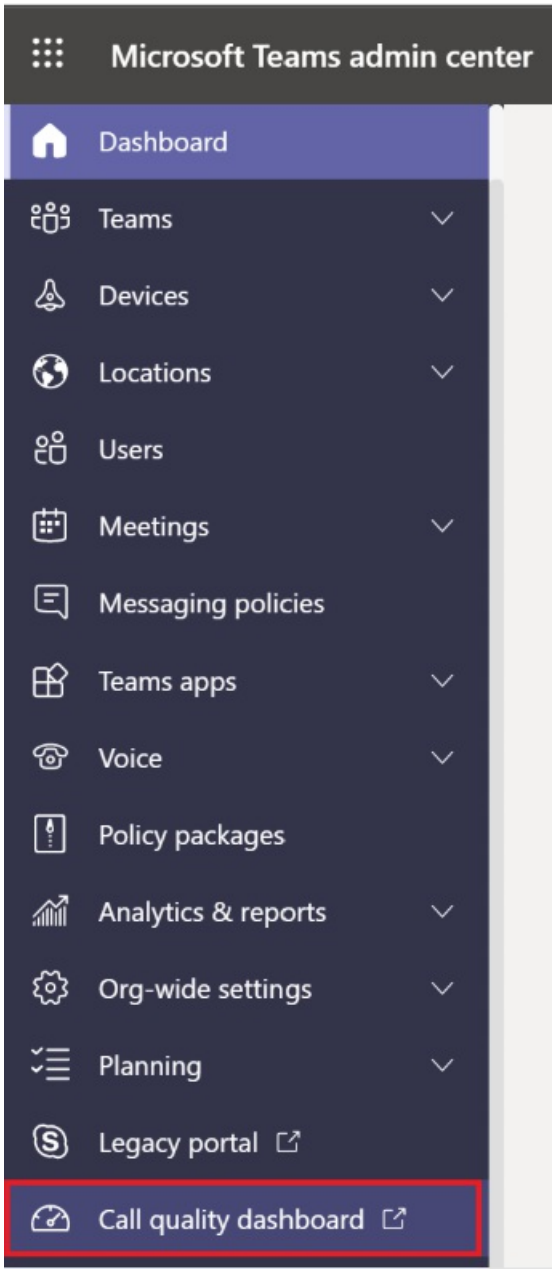
Manage call and meeting quality in Teams

Teams Troubleshooting

Set up Call Quality Dashboard (CQD)

2/6/2020 • 2 minutes to read • Edit Online

Open the Microsoft Call Quality Dashboard (CQD) at https://cqd.teams.microsoft.com (sign in with your admin credentials). Or go to the Teams admin center and select **Call Quality Dashboard**.



On the page that opens, click **Sign in** and enter your Global Administrator account or Microsoft Teams Service Admin account information. After the first time you sign in, CQD will begin collecting and processing data. Keep in mind that it may take one or more hours to process enough data to display meaningful results in the reports.

CQD shows call and meeting quality, at an org-wide level, for Microsoft Teams, Skype for Business Online, and Skype for Business Server 2019.

IMPORTANT

To use CQD with Skype for Business Server 2019, you'll have to Configure Call Data Connector. See Plan Call Data Connector before you start.

Assign admin roles for access to CQD

Assign roles for accessing CQD to the people who need to use it.

If you want non-admin users (such as support engineers and helpdesk agents) to use Call Quality Dashboard, you can assign those users one of the following roles, which gives access to CQD.

	VIEW REPORTS	VIEW EUII FIELDS	CREATE REPORTS	UPLOAD BUILDING DATA
Office 365 Global Administrator	Yes	Yes	Yes	Yes
Teams Service Administrator	Yes	Yes	Yes	Yes
Teams Communications Administrator	Yes	Yes	Yes	Yes
Teams Communications Support Engineer	Yes	Yes	Yes	No
Teams Communications Support Specialist	Yes	No	Yes	No
Skype for Business Administrator	Yes	Yes	Yes	Yes
Azure AD Global Reader	Yes	Yes	Yes	No
Office 365 Reports Reader[1]	Yes	No	Yes	No

[1] In addition to reading CQD reports, the Office 365 Reports Reader can view all the activity reports in the admin center and any reports from the Microsoft 365 Adoption content pack.

NOTE

If you're not seeing EUII (end-user identifiable information) and you have one of the roles that's permitted to see this information, keep in mind that CQD only keeps EUII for 28 days. Anything older than 28 days is deleted.

For more information about these roles, see About Office 365 admin roles.

After the first time you sign in, CQD will begin collecting and processing data. As of December 2019, you can still access the older version of CQD (cqd.lync.com), although the legacy portal gives you a link to the latest CQD (cqd.teams.microsoft.com). Eventually, the older version of CQD will be decommissioned. As of July 1, 2020, the

older version of CQD accesses data from the latest CQD.

Migrate building data and reports from previous version of CQD

> **IMPORTANT**
>
> As of July 1, 2020, you can no longer migrate building data and reports from the old CQD (https://CQD.lync.com).

Use Power BI to analyze CQD data

New in January 2020: Download Power BI query templates for CQD. Customizable Power BI templates you can use to analyze and report your CQD data.

Read Use Power BI to analyze CQD data to learn more.

Related topics

Improve and monitor call quality for Teams

What is CQD?

Upload tenant and building data

CQD data and reports

Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Stream Classification in CQD

Use Power BI to analyze CQD data

Microsoft 365 Business Voice partner resources

2/8/2020 • 2 minutes to read • Edit Online

Use this article to help deploy and support Microsoft 365 Business Voice. The article focuses on Business Voice and calling.

Before you deploy Business Voice, you should have a foundation in the deployment and support of Microsoft Teams.

This article is a concise resource for technical delivery and support personnel who are new to Business Voice. Use these resources to expand your knowledge of Business Voice, including the fundamentals of deployment and support.

- Teams practical guidance
- Pre-assessment and planning
- Deploy
- Operate
- Support
- Troubleshooting
- Partner support plans
- Teams service provider guide

Expand Microsoft Teams across your organization

8/5/2020 • 2 minutes to read • Edit Online

These resources build on the standard Teams deployment guidance and are designed to help you get the most out of Teams for specific organization types. If you haven't deployed Teams yet, see the recommended path to Teams in How to roll out Microsoft Teams.

	Shifts for Teams		Teams for Healthcare		Teams for Education
	Teams for Retail		Teams for Government		

Get started with Teams templates using Microsoft Graph

11/2/2020 • 4 minutes to read • Edit Online

> **NOTE**
> Teams templates currently don't support creating private channels. Private channel creation isn't included in template definitions.

Teams templates are pre-built definitions of a team's structure designed around a business need or project. You can create your own template in the admin console. With Microsoft Graph, you use the pre-built templates . You can use Teams templates to quickly create rich collaboration spaces with channels for different topics and preinstall apps to pull in mission-critical content and services. Teams templates provide a predefined team structure that can help you easily create consistent teams across your organization.

In this article, we'll explain the properties that can be defined in templates, what base template types are, and how you can use a few samples requests to create a team from a template.

This article is for you if you're:

- Responsible for planning, deploying, and managing multiple teams across your organization
- A developer wanting to programmatically create a team with predefined channels and apps

Teams template capabilities

Most properties in a team are included and supported by templates. But there are a few properties and features that aren't currently supported. The following table provides a quick summary of what's included and what's not included in Teams templates.

TEAM PROPERTIES SUPPORTED BY TEAMS TEMPLATES	TEAM PROPERTIES NOT YET SUPPORTED BY TEAMS TEMPLATES
Base template type	Team membership
Team name	Team picture
Team description	Channel settings
Team visibility (public or private)	Connectors
Team settings (for example, member, guest, @ mentions)	Files and content
Auto-favorite channel	
Installed app	
Pinned tabs	

NOTE

We'll be adding more template capabilities in future releases of Microsoft Teams, so check back for the most up-to-date information on supported properties.

What are base template types

Base template types are special templates that Microsoft created for specific industries. These base templates often contain proprietary apps that aren't available in the store. In addition, base templates often contain team properties that aren't yet supported individually in Teams templates. Learn how to use the team templates in Microsoft Graph.

Once a base template type is defined, you can extend or override these special templates with additional properties that you'd like to specify. Some base template types contain properties that can't be overridden.

By default the base template is set to **Standard**, which doesn't contain any additional proprietary apps or special properties. Below is the current list of base template types available.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Standard	`https://graph.microsoft.com/beta/teamsTemplates('standard')`	No additional apps and properties
Education - Class Team	`https://graph.microsoft.com/beta/teamsTemplates('educationClass')`	Apps: • OneNote Class Notebook (pinned to the **General** tab) • Assignments app (pinned to the **General** tab) Team properties: • Team visibility set to **HiddenMembership** (cannot be overridden)
Education - Staff Team	`https://graph.microsoft.com/beta/teamsTemplates('educationStaff')`	Apps: • OneNote Staff Notebook (pinned to the **General** tab)
Education - PLC team	`https://graph.microsoft.com/beta/teamsTemplates('educationProfessionalLearningCommunity')`	Apps: • OneNote PLC Notebook (pinned to the **General** tab)

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Retail - Store	`https://graph.microsoft.com/beta/teamsTemplates('retailStore')`	Channels: • Shift handoff • Learning Team properties • Team visibility set to Public Member permissions • Prevent members from creating, updating, or removing channels • Prevent members from adding or removing apps • Prevent members from creating, updating, or removing connectors
Retail - Manager collaboration	`https://graph.microsoft.com/beta/teamsTemplates('retailManagerCollaboration')`	Channels: • Learning • Operations Team properties: • Team visibility set to Private Member permissions: • Prevent members from creating, updating, or removing channels • Prevent members from adding or removing apps • Prevent members from creating, updating, or removing connectors
Healthcare - Ward	`https://graph.microsoft.com/beta/teamsTemplates('healthcareWard')`	Channels: • Announcements* • Huddles* • Rounds • Staffing* • Training* *Auto-favorited channels
Healthcare - Hospital	`https://graph.microsoft.com/beta/teamsTemplates('healthcareHospital')`	Channels: • Announcements* • Compliance* • Custodial • Human Resources • Pharmacy *Auto-favorited channel

Use the following templates to create teams in both the Teams client as well as Microsoft Graph.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Adopt Office 365	`com.microsoft.teams.template.AdoptOffice365`	Channels: • General • Announcements • Champions corner • Team forms Apps: • Wiki • Calendar
Manage a project	`com.microsoft.teams.template.ManageAProject`	Channels: • General • Announcements • Resources • Planning Apps: • Wiki • OneNote
Manage an event	`com.microsoft.teams.template.ManageAnEvent`	Channels: • General • Announcements • Budget • Content • Logistics • Planning • Marketing and PR Apps: • Wiki • Website • YouTube • Planner • OneNote
Onboard employees	`com.microsoft.teams.template.OnboardEmployees`	Channels: • General • Announcements • Employee chat • Training Apps: • Wiki • Communities

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Organize help desk	`com.microsoft.teams.template.OrganizeHelpDesk`	Channels: • General • Announcements • FAQ Apps: • Wiki • OneNote
Collaborate on patient care	`healthcareWard`	Channels: • General • Announcements • Huddles • Rounds • Staffing • Training Apps: • Wiki
Collaborate on global crisis or event	`com.microsoft.teams.template.CollaborateOnAGlobalCrisisOrEvent`	Channels: • General • Announcements • World news • Business continuity • Remote working • Internal comms • External comms • Customer complaints • Kudos • Executive update Apps: • Praise • Wiki • Website
Collaborate within a bank branch	`com.microsoft.teams.template.CollaborateWithinABankBranch`	Channels: • General • Announcements • Huddles • Customer meetings • Coaching • Skills development • Loan processing • Customer complaints • Kudos • Fun stuff • Compliance

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Coordinate incident response	`com.microsoft.teams.template.CoordinateIncidentResponse`	Channels: • General • Announcements • Logistics • Planning • Recovery • Urgent Apps: • Wiki • Excel • OneNote • SharePoint • Planner
Hospital	`healthcareHospita`	Channels: • General • Announcements • Compliance • Custodial • Human resources • Pharmacy Apps: • Wiki
Organize a store	`retailStore`	Channels: • General • Shift handoff • Learning Apps: • Wiki
Quality and safety	`com.microsoft.teams.template.QualitySafety`	Channels: • General • Announcements • Line 1 • Line 2 • Line 3 • Safety • Training • Maintenance • Fun stuff Apps: • Wiki

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Retail - manager collaboration	`retailManagerCollaboration`	Channels: • General • Operations • Learning Apps: • Wiki

See Get started with Teams templates in the Admin center for more details.

Related topics

- Get started with Teams templates in the admin console
- Create team (in preview)
- New-Team
- Admin training for Microsoft Teams

Shifts for Teams

12/5/2020 • 2 minutes to read • Edit Online

Teams gives Firstline Workers in your organization the tools they need to communicate and collaborate effectively and do their best work. Here you'll find the admin guidance you need to set up and manage Shifts, the schedule management tool, in Teams.

Set up and manage Shifts for your organization

	**Manage Shifts in your organization**		**Shifts Help for Firstline Workers**

Shifts extensions

	**Shift Graph APIs** Shifts Graph APIs allow you to integrate Shifts data with external workforce management systems, providing you the flexibility to build custom Shifts experiences in the back end, while giving users a rich, front-end experience in Teams.
	**Workforce management integrations** If you're using third-party workforce management systems, such as Kronos and JDA, for scheduling, time, and attendance, you can integrate directly with Shifts through Shifts Graph APIs and SDK with open source integrations.
	**Shifts + Power Automate** Shifts + Power Automate lets you take info from Shifts and create custom workflows with other apps and perform operations at scale. Automate key processes with little to no code. The triggers and templates support a variety of scenarios such as enabling auto-approvals for shift requests when a manager's approval isn't needed.

Featured training

	Video: What is Shifts?		Video: What is Shifts?		Video: Manage a Shifts schedule

Manage the Shifts app for your organization in Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

IMPORTANT

Effective June 30, 2020, Microsoft StaffHub has been retired. We're building StaffHub capabilities into Microsoft Teams. Today, Teams includes the Shifts app for schedule management and additional capabilities will roll out over time. StaffHub stopped working for all users on June 30, 2020. Anyone who tries to open StaffHub is shown a message directing them to download Teams. To learn more, see Microsoft StaffHub has been retired.

Overview of Shifts

The Shifts app in Microsoft Teams keeps Firstline Workers connected and in sync. It's built mobile first for fast and effective time management and communication for teams. Shifts lets Firstline Workers and their managers use their mobile devices to manage schedules and keep in touch.

- Managers create, update, and manage shift schedules for teams. They can send messages to one person ("there's a spill on the floor") or the entire team ("the regional GM is arriving in 20 minutes"). They can also send policy documents, news bulletins, and videos.
- Employees view their upcoming shifts, can see who else is scheduled for the day, request to swap or offer a shift, and request time off.

It's important to know that Shifts currently doesn't support guest users. This means that guests on a team can't be added to or use shift schedules when Guest access is turned on in Teams.

NOTE

For details about Shifts capabilities on different platforms, see Teams features by platform.

Availability of Shifts

Shifts is available in all Enterprise SKUs where Teams is available.

Location of Shifts data

Shifts data is currently stored in Azure in data centers in North America, Western Europe, and Asia Pacific. For more information about where data is stored, see Where is my data?

Set up Shifts

Enable or disable Shifts in your organization

Shifts is enabled by default for all Teams users in your organization. You can turn off or turn on the app at the org level on the Manage apps page in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps** .
2. In the list of apps, do one of the following:

- To turn off Shifts for your organization, search for the Shifts app, select it, and then click **Block**.
- To turn on Shifts for your organization, search for the Shifts app, select it, and then click **Allow**.

Enable or disable Shifts for specific users in your organization

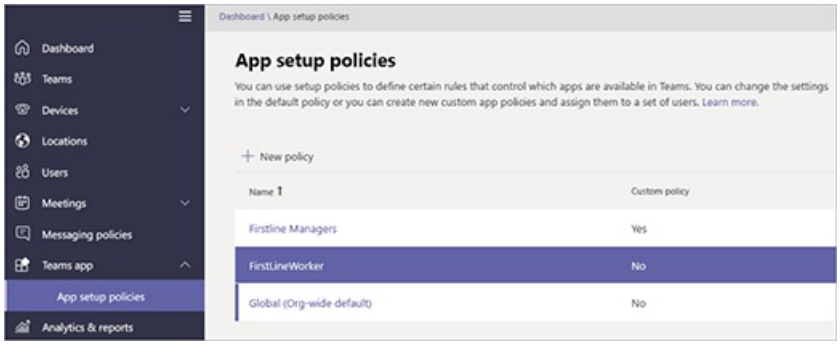
To allow or block specific users in your organization from using Shifts, make sure Shifts is turned on for your organization on the Manage apps page, and then create a custom app permission policy and assign it to those users. To learn more, see Manage app permission policies in Teams.

Use the FirstlineWorker app setup policy to pin Shifts to Teams

App setup policies let you customize Teams to highlight the apps that are most important for users in your organization. The apps set in a policy are pinned to the app bar—the bar on the side of the Teams desktop client and at the bottom of the Teams mobile clients—where users can quickly and easily access them.

Teams includes a built-in FirstlineWorker app setup policy that you can assign to Firstline Workers in your organization. By default, the policy includes the Activity, Shifts, Chat, and Calling apps.

To view the FirstlineWorker policy, in the left navigation of the Microsoft Teams admin center, go to **Teams app** > **App setup policies**.



Assign the FirstlineWorker app setup policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Search the audit log for Shifts events

(in preview)

You can search the audit log to view Shifts activity in your organization. To learn more about how to search the audit log and to see a list of Shifts activities that are logged in the audit log, see Search the audit log for events in Teams.

Before you can search the audit log, you have to first turn on auditing in the Security & Compliance Center. To learn more, see Turn audit log search on or off. Keep in mind that audit data is only available from the point at which you turned on auditing.

Related topics

- Shifts Help for Firstline Workers
- Assign policies to your users in Teams

Get started with Teams for healthcare organizations

12/5/2020 • 6 minutes to read • Edit Online

Microsoft Teams offers a number of telemedicine features useful for hospitals and other Healthcare organizations. Teams features are under development to aid hospitals with:

- Virtual visits and Electronic Healthcare Record (EHR) integration
- Teams policy packages
- Secure messaging
- Teams templates
- Care coordination and collaboration

This functionality is part of the Microsoft Cloud for Healthcare. Learn more about using this solution, which brings together capabilities from Azure, Dynamics 365, and Microsoft 365 at Microsoft Cloud for Healthcare.

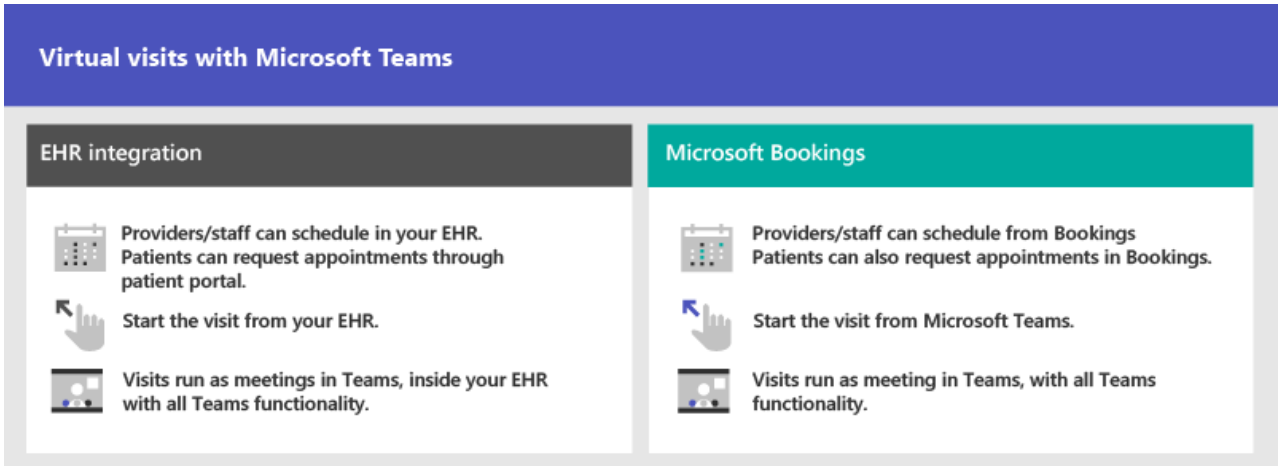
Watch the following video to learn more about using the healthcare collection to enhance health team collaboration in Microsoft Teams.

> **NOTE**
>
> The content in this section assumes that you've already deployed Teams in your organization. If you haven't yet rolled out Teams, start by reading How to roll out Microsoft Teams.

Virtual visits and Electronic Healthcare Record (EHR) integration

Use the complete meetings platform in Microsoft Teams to schedule, manage, and conduct virtual visits with patients.

- If your organization already uses Electronic Health Records, or EHR, you can integrate Microsoft Teams for a more seamless experience. Microsoft Teams Electronic Health Record (EHR) Connector makes it easy for clinicians to launch a virtual patient visit or consultation with another provider in Teams directly from the EHR system. To learn more, see Virtual visits with Teams - Integration into EHR.
- If you aren't using a supported EHR, you can use Microsoft Bookings and the Bookings app in Teams. To learn more, see Bookings app and virtual visits in Microsoft Teams.



Teams policy packages

Apply Teams policy packages to define what different roles can do in Teams. For example, specify policies for:

- Clinical workers, such as registered nurses, charge nurses, physicians, and social workers, so that they can have full access to chat, calling, shift management, and meetings.
- Information workers in your healthcare organization, such as IT personnel, informatics staff, finance personnel, and compliance officers, can have full access to chat, calling, and meetings.
- Patient rooms, to control settings for patient room devices.

To learn more, see Teams policy packages for healthcare.

Secure messaging

Secure messaging supports collaboration within health teams, including several new features:

- A message sender can set a special priority for their message, so the recipient is repeatedly notified until they read the message.
- A message sender can request a read receipt, so they are notified when a message they sent was read by the message recipient.

Together, these features allow quicker attention to urgent messages and confidence that the message was received and read. New health teams using these features can be created on a per-patient basis. These features are policy-based, and can be assigned to individuals or entire Teams.

To learn more, see Get started with Secure Messaging policies for Healthcare organizations.

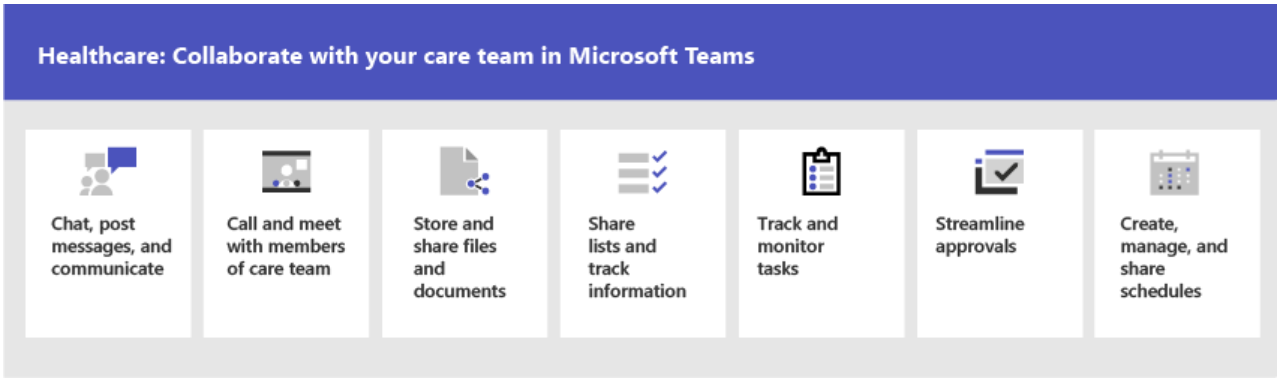
Also related to secure messaging is the ability to have other tenants federated by Healthcare organizations, allowing richer inter-tenant communication. (See Manage external access (federation) in Microsoft Teams).

Teams templates for healthcare organizations

New templates for creating Teams were developed to apply to a Hospital setting, and more are expected soon. This makes it easier to create teams that Healthcare workers use to coordinate care for patients in various departments or wards. To learn more, see Get started with Teams templates for Healthcare organizations. Teams can be started for internal departments such as cardiology, or for care wards, and more templates are in development.

Care coordination and collaboration

Bring your health team together to coordinate care and collaborate with Microsoft Teams.



Microsoft Teams enables physicians, clinicians, nurses, and other staff to collaborate efficiently with included collaboration features in Microsoft Teams, such as:

- Set up teams and channels for your health teams and information workers. Use channels with tabs as a way to structure their work, with additional help from tabs to which they can pin information sources.

- Chat, post messages, and communicate. Your team can have persistent conversations about different patients needing attention.
- Call and meet with members of the health team. Set up individual meetings, or use channel meetings to manage daily meetings, both with the power of Teams audio, video, screen sharing, recording, and transcription features.
- Store and share files and documents. Your health team is part of a single virtualized team that works and collaborates on Office documents.

In addition, your team can use apps in Teams to:

- Share lists and track information with the Lists app
- Track and monitor tasks with the Tasks app
- Streamline approvals with the Approvals app
- Create, manage, and share schedules with the Shifts app

Share lists and track information with the Lists app

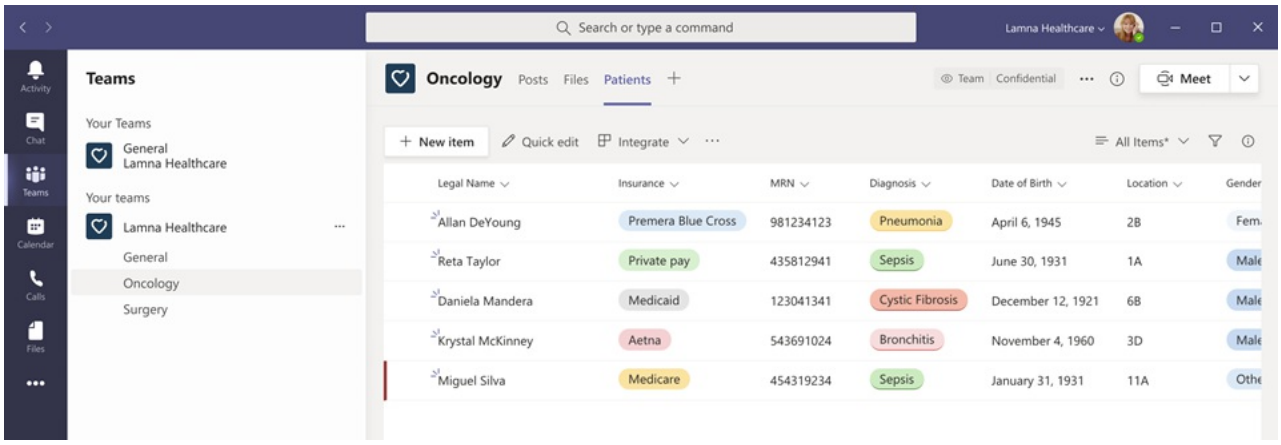
> **NOTE**
>
> Effective October 30, 2020, the Patients app has been retired and replaced by the Lists app in Teams. With Lists, care teams in your healthcare organization can create patient lists for scenarios ranging from rounds and interdisciplinary team meetings to general patient monitoring.

The Lists app in Teams helps teams track information and organize work. The app is pre-installed for all Teams users and is available as a tab in every team and channel. Lists can be created from scratch, from predefined templates, or by importing data to Excel.

health teams can use the Patients template to get started. They can create lists to track the needs and status of patients. Existing patient data on Excel spreadsheets can be brought in to create a list in Teams. These lists can be used for scenarios such as rounds and patient monitoring to coordinate care.

For example, a charge nurse creates a patient list in a team that includes all health team members. During rounds, the health team access Teams on their mobile devices and update patient information in the list, which everyone on the team can view to stay in sync. At rounding sessions where the health team gathers to discuss and evaluate key health performance metrics to ensure a patient is on the right glide path to discharge, they can share this information using Teams on a large display screen. health team members who aren't on site can join remotely.

Here's an example list which was set up for patient rounding.



To learn more, see Manage the Lists app for your organization in Teams.

Track and monitor tasks with the Tasks app

Use Tasks in Teams to track to do items for your whole health team. Your health team can create, assign, and

schedule tasks, categorize tasks, and update status at any time, from any device running Teams.

To learn more, see Manage the Tasks app for your organization in Microsoft Teams

Streamline approvals with the Approvals app

Use Approvals to streamline all of your requests and processes with your team. Create, manage, and share approvals directly from your hub for teamwork. Start an approval flow from the same place you send a chat, in a channel conversation, or from the Approvals app itself. Just select an approval type, add details, attach files, and choose approvers. Once submitted, approvers are notified and can review and act on the request.

You can allow the Approvals app for your organization and add it to your teams. To learn more about managing apps, see Manage your apps in the Microsoft Teams admin center.

Create, manage, and share schedules with the Shifts app and Firstline Worker integration

Microsoft Teams integrates with the Shifts app and Firstline Worker, which can be used to coordinate shift staffing features and more. For example, in Shifts, Nurse managers can set up and coordinate schedules for their staff, and nurses can check schedules and swap shifts. Teams includes a built-in Firstline Worker app setup policy that you can assign to Firstline Workers in your organization. By default, the policy includes the Activity, Shifts, Chat, and Calling apps. This policy controls behavior for these apps, for example, pinning the Shifts app to the app bar so the team can quickly access it.

To learn more, see Manage the Shifts app for your organization in Microsoft Teams.

Virtual visits with Teams - Integration into EHR

12/5/2020 • 6 minutes to read • Edit Online

Microsoft Teams Electronic Health Record (EHR) Connector makes it easy for clinicians to launch a virtual patient visit or consultation with another provider in Teams directly from the EHR system. Built on the Microsoft 365 cloud, Microsoft Teams enables simple, secure collaboration and communication with chat, video, voice, and healthcare tools in a single hub that supports compliance with HIPAA, HITECH certification, and more.

The communication and collaboration platform of Teams makes it easy for clinicians to cut through the clutter of fragmented systems so they can spend time providing the best possible care. Microsoft Teams Electronic Health Record (EHR) Connector can:

- Launch Teams virtual visits from both provider and patient portals.
- Write back into EHR metadata on connect and disconnect events to enable automatic auditing and record keeping.
- Integrate into existing clinician and patient workflows while allowing them to use Microsoft Teams.

  Watch the video of How to manage virtual visits from the EHR portal.

Before you begin

You'll need to make sure you have the following prerequisites before you can integrate the EHR connector:

- Active subscription to Microsoft Cloud for Healthcare or subscription to Microsoft Teams EHR Connector standalone offer.
- Users must have an appropriate Microsoft 365 or Office 365 license that includes Microsoft Teams meetings.
- Microsoft Teams should be adopted and used inside the organization.
- Organizations must have with Epic version November 2018 or later.
- Your systems must meet all software and browser prerequisites.

You'll also need information from the following people in your organization:

- Microsoft 365 administrator
- Epic administrator

> **NOTE**
> Request your Epic admin to provide the Epic-Microsoft Teams Telehealth Integration Guide available in the Epic marketplace.

Connector setup

The connector setup requires that you:

- Launch the EHR Connector configuration portal
- Configure provider organization information

- Verify and approve the configuration
- Review and finish the configuration

Launch the EHR Connector configuration portal

Configuring your healthcare organization to launch virtual visits with Microsoft Teams starts by launching the EHR Connector configuration portal. Use the test URL to configure the connector for your Epic test environment. Use the production URL when you're ready to enable your Epic production environment.

- Test environment https://ehrconnector-ppe.teams.microsoft.com
- Production environment https://ehrconnector.teams.microsoft.com

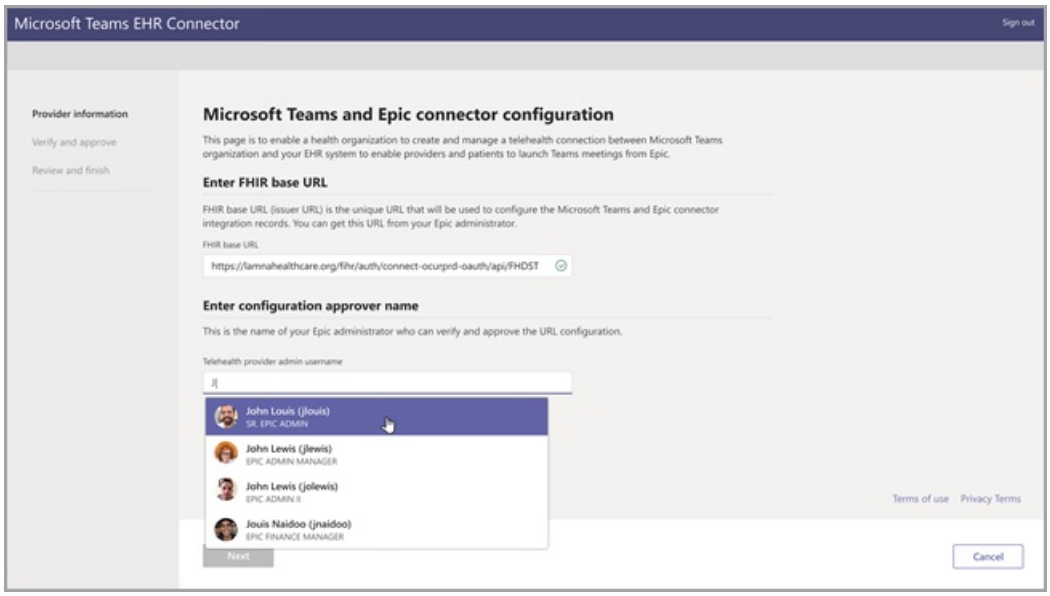
The Microsoft 365 admin and Epic admin from your organization must complete the information and integration steps in the configuration portal. For Epic configuration steps, contact the Epic resource assigned to your organization.

Configure provider organization information

This step is to be completed by the Microsoft 365 administrator. The Microsoft 365 administrator must launch the connector configuration portal and sign in with Microsoft credentials to start the configuration process.

To complete this step, the Microsoft 365 administrator must receive a valid Fast Health Interoperability Resources (FHIR) base URL from your Microsoft 365 administrator and the username of the Epic administrator who will be approving the configuration. The Microsoft 365 administrator must launch the connector configuration page and sign in with Microsoft credentials to start the configuration process.

- The FHIR base URL is a static address corresponding to your server FHIR API endpoint. An example URL is `https://lamnahealthcare.org/fihr/auth/connect-ocurprd-oauth/api/FHDST`.
- Configuration approver name is the name of the Epic system administrator who will be responsible for approving the configuration.

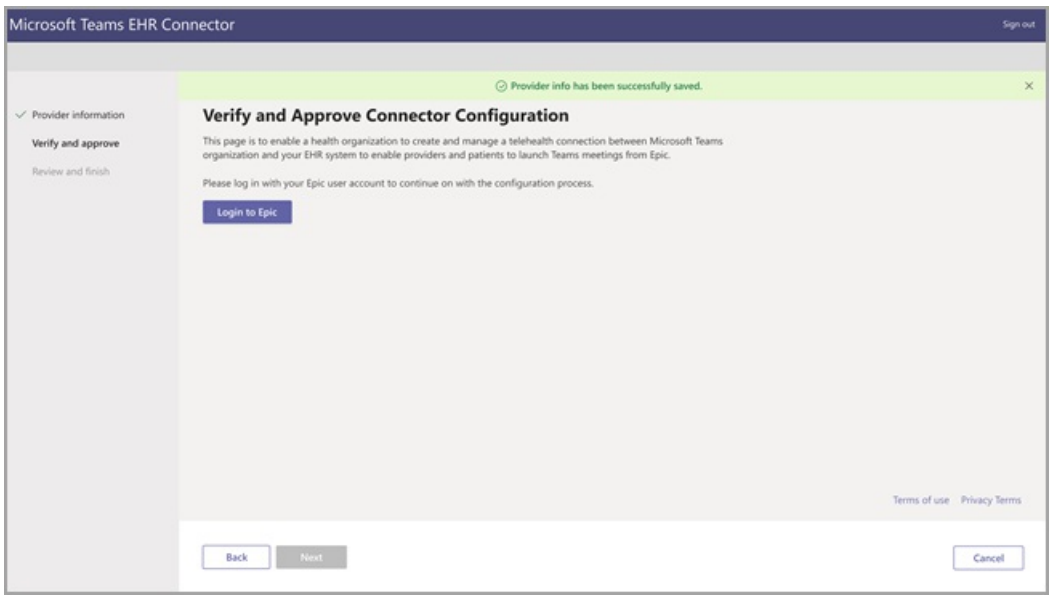


Verify and approve the configuration

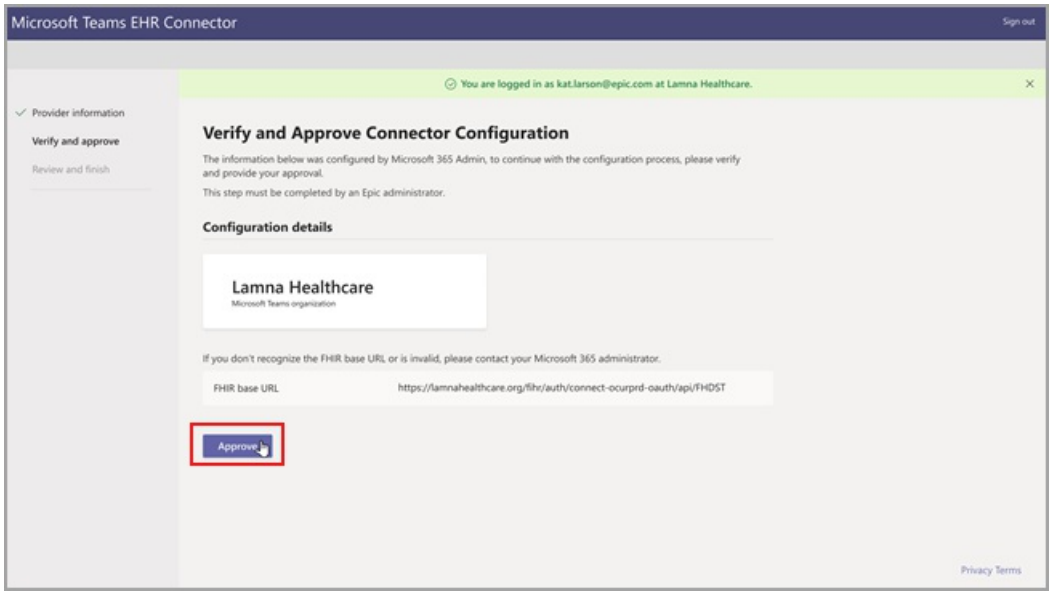
The Epic administrator for your healthcare organization who was added as an approver must now use the same EHR Connector URL from the previous step to sign in using their Microsoft 365 credentials. After successful validation, the approver is going to be asked to sign in using their Epic credentials to validate the Epic organization.

NOTE

The Microsoft 365 admin and Epic admin in your organizations can be the same person. In that case, add your own username as approver in the first step. You'll still need to sign in to Epic to validate your access. The Epic sign in is only used to validate your FHIR base URL. Microsoft will not store credentials or access EHR data with this sign in.



After a successful Epic sign in, the Epic administrator **must** approve the configuration. If the configuration isn't correct, the Microsoft 365 admin will have the ability to modify the original configurations by signing in to the Microsoft EHR Connector portal again.

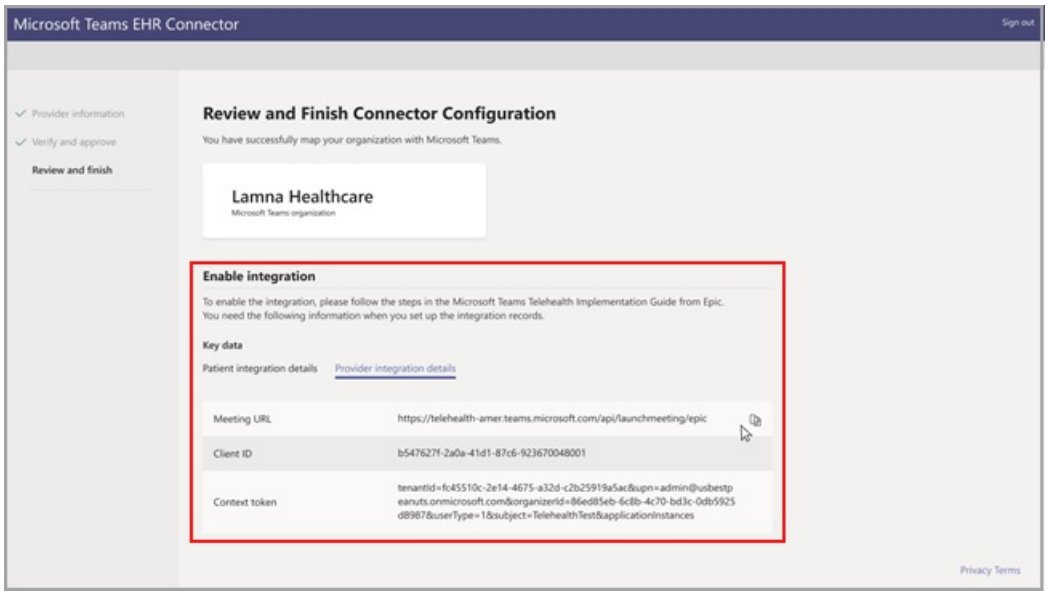


Review and finish the configuration

When the configuration information is approved by the Epic administrator, you'll be presented with integration records for patient and provider launch. These records are necessary to complete the virtual visit configuration in Epic. Refer to the Epic-Microsoft Teams Telehealth Integration guide for more details.

NOTE

At any time the Microsoft 365 or Epic administrator can sign in to the configuration portal to view integration records and modify organization configuration, if needed.



Launch Teams virtual visits

After completing the EHR Connector steps and Epic configuration, your organization is ready to support video visits with Microsoft Teams.

Virtual visit prerequisites

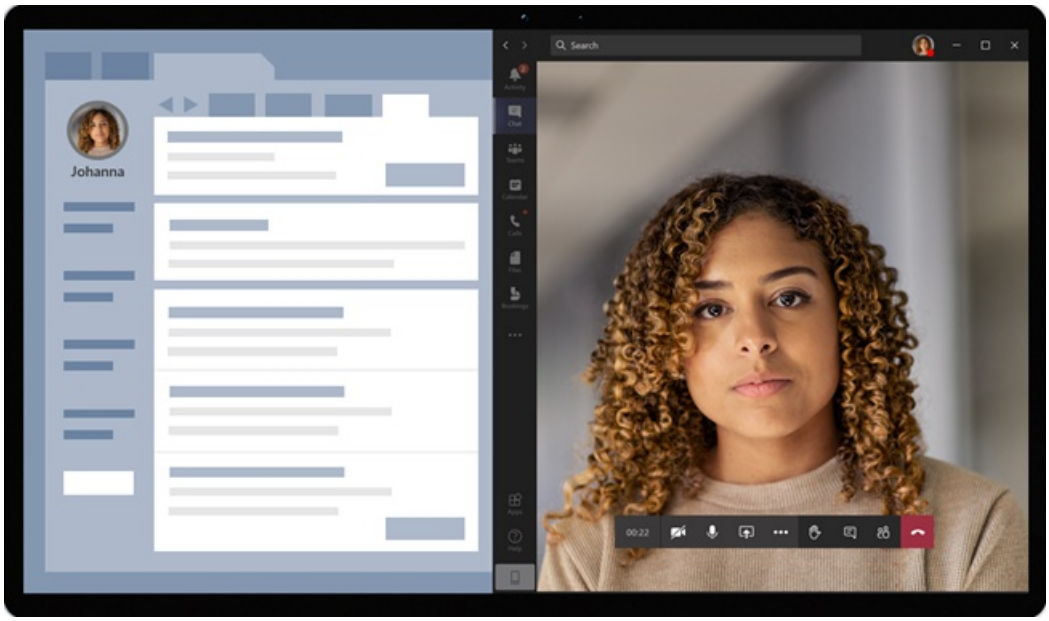
- Your systems must meet all software and browser prerequisites.
- Healthcare organization must have completed the setup between the Epic organization and Microsoft 365 organization.

Provider experience

Healthcare providers from your organization can also join virtual visits with Microsoft Teams from their Epic provider applications (Hyperspace, Haiku, Canto). The **Begin virtual visit** button is embedded in the provider flow.

Key features of the provider experience:

- Providers can join virtual visits using supported browsers or the Microsoft Teams application.
- Providers must do a one time sign in with their Microsoft 365 account when joining a virtual visit for the first time.
- After the one time sign in, the provider will be taken straight to the virtual appointment in Microsoft Teams. (Provider must be signed-in to Microsoft Teams).
- Provider can see real-time updates of participants connect and disconnect for a given appointment. The provider can see when the patient is connected to a virtual visit.

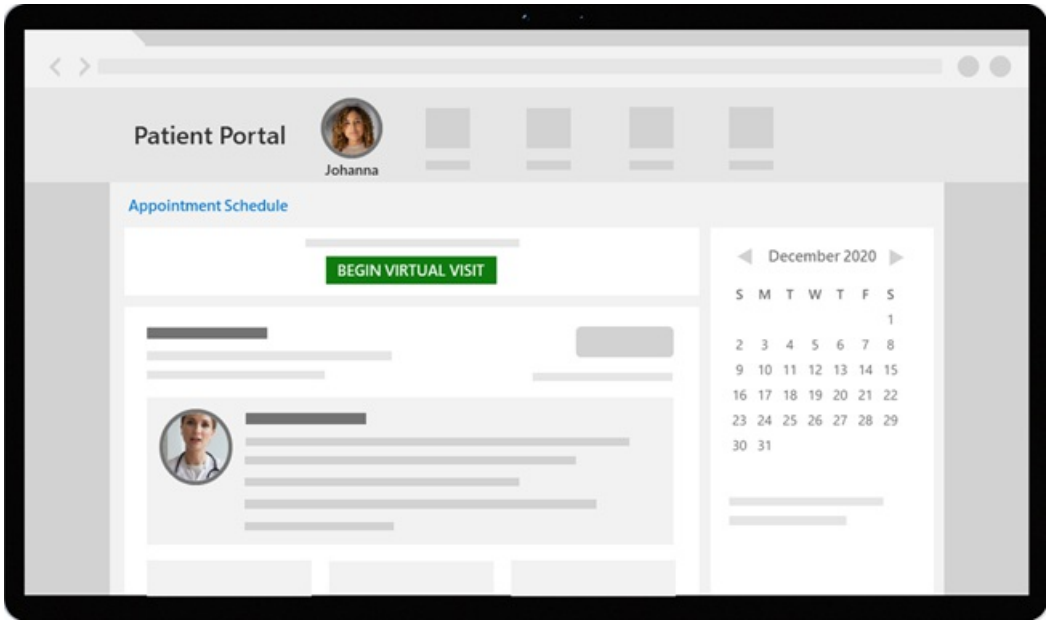


Patient experience

The connector supports patients joining virtual visits through MyChart web and mobile. At the time of the appointment, patients can start a virtual visit from MyChart using the **Begin virtual visit** button.

Key features of the patient experience:

- Patients can join virtual visits from modern web browsers on desktop and mobile without app installation.
- Patients can join virtual visits with a single click and there is no additional account or sign in required.
- Patients aren't required to create a Microsoft account or sign in to launch a virtual visit.
- Patients will be placed in a lobby until the healthcare provider joins the appointment and admits them to the virtual visit.
- Testing of the video and microphone is available in the lobby before joining the virtual visit.



> **NOTE**
>
> Epic, MyChart, Haiku, and Canto are trademarks of Epic Systems Corporation.

Privacy and location of data

Teams integration into EHR systems optimizes the amount of data being used and stored during integration and virtual visit flows. The solution follows the overall Teams privacy and data management principles and guidelines outlined in Teams Privacy.

The Microsoft Teams EHR connector doesn't store nor transfer any identifiable personal data or any health records of patients or healthcare providers from the EHR system. The only data that is stored by the EHR connector is the EHR user's unique ID, which is used during Teams meeting setup. The EHR user's unique ID is stored in one of the three geographic regions described in the Where your Microsoft 365 customer data is stored article. All chat, recordings, and other data entered into Teams by the meeting participants are stored according to existing storage policies. If you want to learn more information on the location of data in Microsoft Teams, visit Locations of data in Teams.

Virtual visits with Microsoft Teams and the Bookings app

11/2/2020 • 3 minutes to read • Edit Online

The Bookings app in Microsoft Teams offers a simple way to schedule in-person and virtual appointments, such as healthcare visits, financial consultations, interviews, customer support, education office hours, and much more.

Schedulers can manage multiple department and staff calendars, as well as communications with internal and external attendees, from a single experience. The virtual appointments themselves are held via Microsoft Teams Meetings, which offers robust videoconferencing capabilities.

> **NOTE**
> Only schedulers need to have the Bookings app installed in Teams. Staff conducting or participating in virtual appointments do not need the app. They can simply join appointments from their Outlook or Teams calendar or from a link in their booking confirmation email.

Prerequisites for using the Bookings app in Teams

- The Exchange mailbox must be in Exchange Online. On-premises Exchange Server mailboxes are not supported.
- Microsoft Bookings must be turned on for the organization.
- Users must have an appropriate license. Office 365 A3, A5, E3, and E5, as well as Microsoft 365 Business Standard, A3, A5, E3, and E5 are supported.
- All users of the Bookings app and all staff participating in meetings must have a license that supports Teams Meeting scheduling.
- Your systems must meet all Software and browser prerequisites.

Availability of Bookings in Teams

Microsoft Bookings App for Teams is available on the desktop and web. It can be found under Apps within Microsoft Teams and under **Manage Apps** within Teams Admin Center.

Control access to Bookings within your organization

There are several ways to control who has access to the Bookings app and to specific features of the app. To learn how to turn Microsoft Bookings on or off in the Microsoft 365 admin center, as well as how to create a Bookings app policy to allow selected users to create Bookings calendars, see Get access to Microsoft Bookings. You can also learn how to Create a Teams app policy to pin the Bookings app for select users.

Recommended Meeting Policy Settings

To enable the best experience for Bookings, create a staff meeting policy to automatically admit **Everyone in your organization**. This will allow staff to join the appointment automatically and enable lobby experience for external attendees. You can learn more about automatically admitting people to meetings.

Optional staff approvals setting

As an extra privacy setting, you can choose to require staff to opt in before their schedule availability information is

shared through Bookings and before they can be booked for an appointment.

To enable this setting, go to **Microsoft 365 admin center** > **Settings** > **Settings**, then select **Bookings**.

With this setting turned on, staff will receive an email in which they are asked to approve membership to a booking calendar.

This feature is gradually being rolled out worldwide to Microsoft 365 and Office 365 customers. If all options are not yet available in your environment, check back soon.

Changing your default domain when setting up Bookings mailboxes

When setting up a Bookings mailbox, the default email domain of your Microsoft 365 or Office 365 organization is used. However, this can cause problems when sending meeting invites to external recipients; your invite might be flagged as spam and moved to the recipient's junk folder, so the recipient might never see your invite.

We recommend that you change the default domain prior to creating your Bookings mailbox. For information on how to do this, see the Domains FAQ.

If you need to change the default domain after your Bookings mailbox has already been created, you can do so with PowerShell:

```
Set-Mailbox -identity business@domain.onmicrosoft.com -WindowsEmailAddress business@domain.com -EmailAddresses
business@domain.com
```

For more information, see the PowerShell documentation for the Set-Mailbox cmdlet.

> **NOTE**
> If you are using an Exchange hybrid configuration, we recommend that you thoroughly test mail flow between on-premises Exchange and Exchange Online when changing the default domain.

Sending feedback

We welcome your feedback on:

- User experience or ease of use
- Feature gaps or missing functionality
- Bugs or issues

To send feedback, click the **Help** button near the bottom of the Teams left navigation bar, then click **Report a Problem** for **ALL** issues. Please note at the beginning of your feedback report that you are sending feedback about "Bookings" so we can easily identify Bookings issues.

Related topics

Bookings documentation for end users

Teams policy packages for healthcare

12/5/2020 • 4 minutes to read • Edit Online

Overview

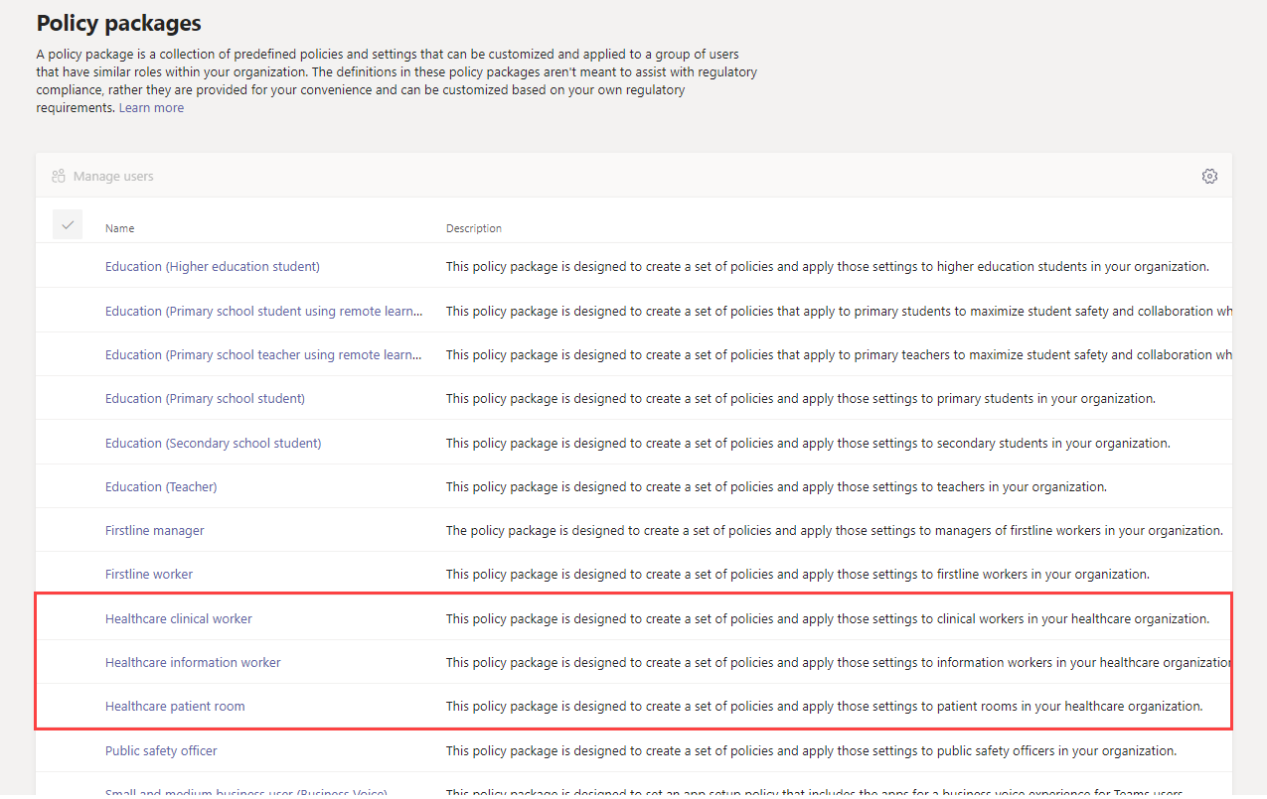
A policy package in Microsoft Teams is a collection of predefined policies and policy settings that you can assign to users who have similar roles in your organization. Policy packages simplify, streamline, and help provide consistency when managing policies. You can customize the settings of the policies in the package to suit the needs of your users. When you change the settings of policies in a policy package, all users who are assigned to that package get the updated settings. You can manage policy packages by using the Microsoft Teams admin center or PowerShell.

Policy packages pre-define policies for the following, depending on the package:

- Messaging
- Meetings
- Calling
- App setup
- Live events

Teams currently includes the following healthcare policy packages.

PACKAGE NAME IN THE MICROSOFT TEAMS ADMIN CENTER	BEST USED FOR	DESCRIPTION
Healthcare clinical worker	Clinical workers in your healthcare organization	Creates a set of policies and policy settings that give clinical workers such as registered nurses, charge nurses, physicians, and social workers full access to chat, calling, shift management, and meetings.
Healthcare information worker	Information workers in your healthcare organization	Creates a set of policies and policy settings that give information workers such as IT personnel, informatics staff, finance personnel, and compliance officers, full access to chat, calling, and meetings.
Healthcare patient room	Patient room devices	Creates a set of policies and policy settings that apply to patient rooms in your healthcare organization.



Each individual policy is given the name of the policy package so you can easily identify the policies that are linked to a policy package. For example, when you assign the Healthcare clinical worker policy package to clinicians in your organization, a policy named Healthcare_ClinicalWorker is created for each policy in the package.



Get started with policy packages

To get you started with Healthcare policy packages, on the Microsoft Admin Center onboarding hub, select **Healthcare**, and then select **Assign policy settings by role**. Once you're ready to get started, decide which policy packages you'd like to assign individuals in your organization to.

Select **View policy details** to learn more about the specific policies in a package and their respective settings. These can be customized after assignment in the Teams Admin Center.

Choose one or multiple packages to assign and then click **Next**. You can search for and add people to the policy package best suited for their role. An individual can't be assigned to more than one policy package at one time.

Once you've added people to the right policy package, **Finish** finalizes your selections. You can continue to customize and manage policy packages in the Microsoft Teams admin center.

Manage policy packages

View

View the settings of each policy in a policy package before you assign a package. In the left navigation of the Microsoft Teams admin center, go to **Policy packages**, select the package name, and then select the policy name.

Decide whether the predefined values are appropriate for your organization or whether you need to customize them to be more restrictive or lenient based on your organization's needs.

Customize

Customize the settings of policies in the policy package, as needed, to fit the needs of your organization. Any changes you make to policy settings are automatically applied to users who are assigned the package. To edit the settings of a policy in a policy package, in the left navigation of the Microsoft Teams admin center, go to **Policy packages**, select the policy package, select the name of the policy you want to edit, and then select **Edit**.

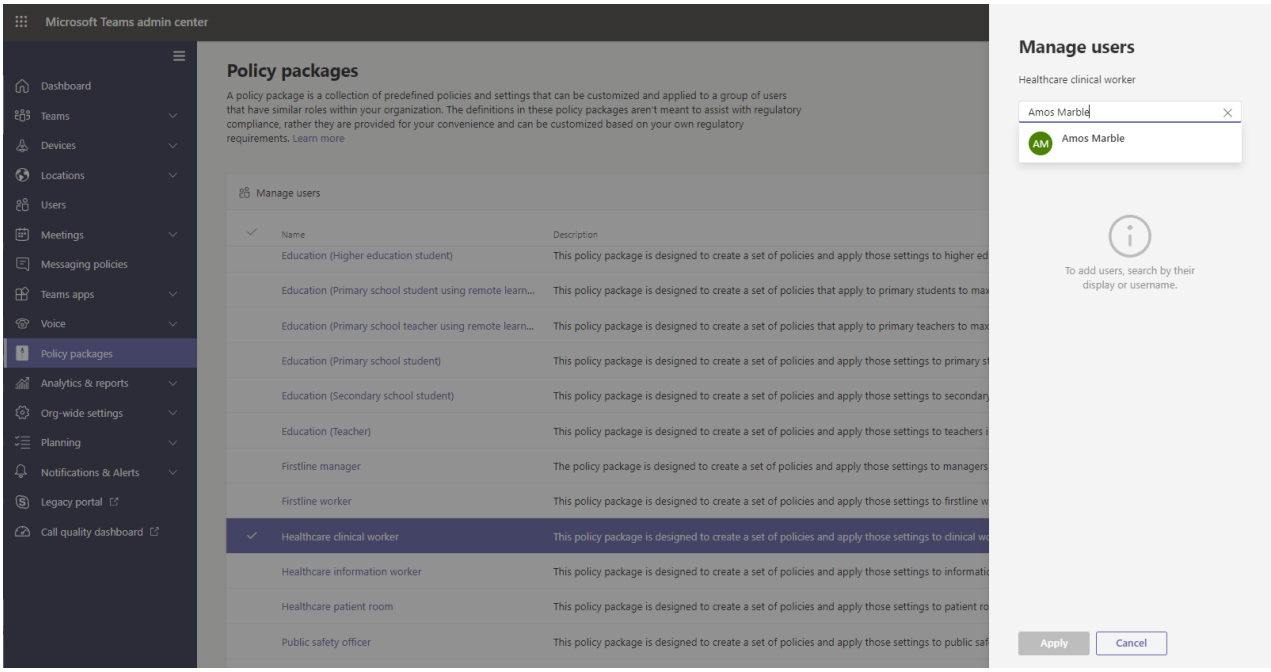
Keep in mind that you can also change the settings of policies in a package after you assign the policy package. To learn more, see Customize policies in a policy package.

Assign

Assign the policy package to users. If a user has a policy assigned, and then later you assign a different policy, the most recent assignment will take priority.

Assign a policy package to one or several users

To assign a policy package to one or multiple users, in the left navigation of the Microsoft Teams admin center, go to **Policy packages**, and then select **Manage users**.



To learn more, see Assign a policy package.

If a user has a policy assigned, and then later you assign a different policy, the most recent assignment will take priority.

Assign a policy package to a group

This feature is in private preview

Policy package assignment to groups let you assign multiple policies to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly. This method is recommended for groups of up to 50,000 users but will also work with larger groups.

To learn more, see Assign a policy package to a group.

Assign a policy package to a large set (batch) of users

Use batch policy package assignment to assign a policy package to large sets of users at a time. You use the New-CsBatchPolicyPackageAssignmentOperation cmdlet to submit a batch of users and the policy package that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch.

A batch can contain up to 5,000 users. You can specify users by their object Id, UPN, SIP address, or email address. To learn more, see Assign a policy package to a batch of users.

Related topics

Manage policy packages in Teams

Assign policies to your users in Teams

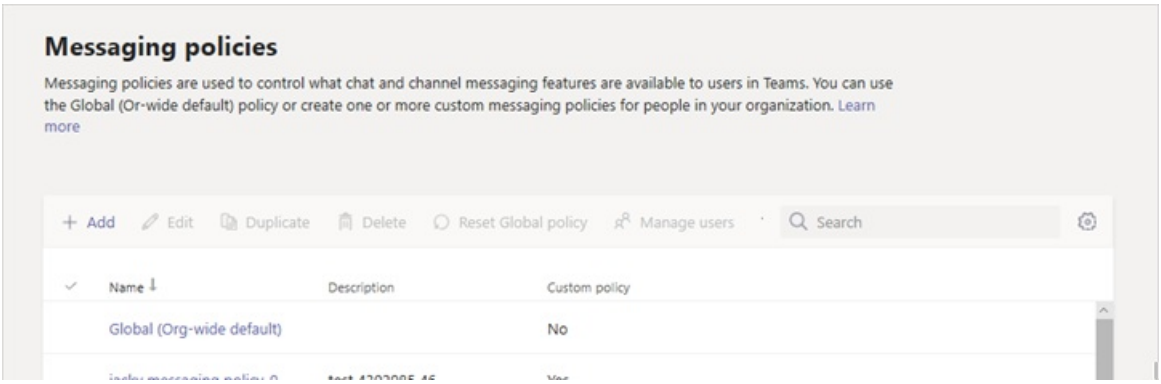
Secure Messaging for healthcare organizations

11/2/2020 • 4 minutes to read • Edit Online

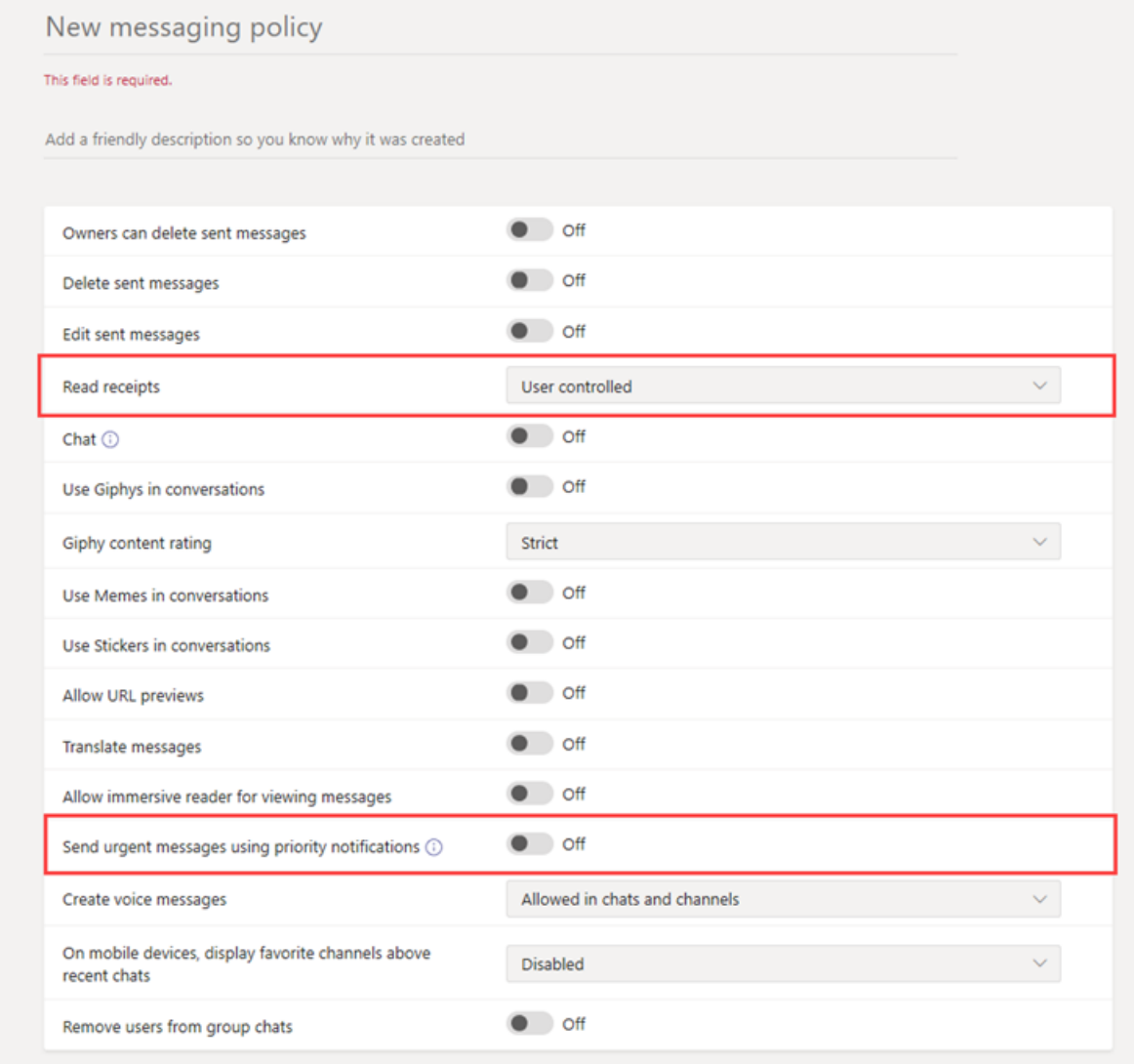
Messaging policies are used to control which chat and channel messaging features are available to users in Microsoft Teams, and are part of the overall deployment of Secure Messaging for healthcare organizations like Hospitals, clinics, or doctor's offices, where having a message picked up and acted upon in a timely manner is crucial, as is knowing when crucial messages are read.

You can use the global (Org-wide default) policy or create one or more custom messaging policies for people in your organization. Users in your organization will automatically get the global policy unless you create and assign a custom policy. After you create a custom policy, assign it a user or groups of users in your organization. For example, you may choose to only allow certain job roles to use these features (perhaps doctors and nurses only) and other workers (like the janitorial or kitchen staff) to get a more limited set of features. Decide for yourself what needs your organization has, the guidance here is at most a suggestion.

Policies can be easily managed in the Microsoft Teams admin center by logging in with administrator credentials and choosing **Messaging policies** in the left navigation pane.



To edit the existing default Messaging policy for your organization, click **Global (Org-wide default)**, and then make your changes. To create a new custom messaging policy, click **Add** and then select your settings. Choose **Save** when you are done.



The following settings are of special interest for Healthcare applications, and should be considered when designing a custom policy used in the Healthcare field:

Read receipts

Read receipts allows the sender of a chat message to know when their message was read by the recipient in 1:1 and group chats 20 people or less. Use this setting to specify whether read receipts are user controlled, on for everyone, or off for everyone. Message read receipts are important in Healthcare organizations because they remove uncertainly about whether a message was read.

For Healthcare applications, choose either **User controlled** or **On for everyone**. Be aware that when using the **On for everyone** setting, the only way to set receipts for the whole tenant is either to have only one messaging policy for the whole tenant (the default policy named "Global (Org-wide Default)") or to have all messaging policies in the tenant use the same settings for receipts. The read receipts feature is most effective when the feature is enabled to **On for everyone**.

Usage example without read receipts: Jakob Roth, a high risk patient, is admitted to the hospital. Sofia Krause is a nurse working as part of the inter-disciplinary team (IDT) of medical workers, including different specialists, is assigned as the primary care coordinator in charge of this patient. Sofia sends emails and other instant messages to a groups of nurses and doctors who use a variety of messaging clients and apps, and often gets no response or indication whether a message was read by team members. Due to tangled communication processes, Jakob's medication is misapplied and his hospital stay is extended.

Usage example with read receipts: Jakob Roth, a high risk patient, is admitted to the hospital. Sofia Krause is a nurse working as part of the inter-disciplinary team (IDT) of medical workers, including different specialists, is

assigned as the primary care coordinator in charge of this patient. Sofia starts a group chat with a set of doctors and other nurses who will be working with the patient to coordinate care and starts an emergency triage. The nurses and doctors communicate and collaborate over the patient's care plan throughout the care coordination process. Important and urgent messages are sent through 1:1 and group chat conversations. Sofia uses the read receipts functionality to determine if messages sent requesting support are delivered and read by the targeted physicians or nurses. Jakob's patient outcomes are near-optimal and he goes home sooner because his health team communicates smoothly.

Send urgent messages using priority notifications

A user can mark a message as *urgent* when sending chat messages to other users. This feature helps hospital staff alert one another when a critical incident requires their attention. Unlike regular *important* messages, priority notifications notify users every two minutes for up to 20 minutes or until the message is picked up and read by the recipient, maximizing the likelihood that the message is acted upon in a timely manner.

An admin can enable or disable the ability for users assigned this policy to send priority notifications. This feature is on by default. The recipient of the priority message might not have the same messaging policy, and will not have an option to disable receiving priority messages. For Healthcare applications, we recommend enabling the feature for at least some users, but you'll need to determine which ones.

Usage example: Sofia Krause is readmitting a high-risk patient, Jakob Roth. Manuela Carstens, a physician, is the primary care doctor for this patient. Sofia sends a message to Manuela using a priority notification asking for immediate help with triage of Jakob. Manuela's phone receives the message but Manuela didn't feel the phone vibration and does not reply. Teams re-notifies Manuela and will continue to persistently re-notify until she reads the message. If read receipts are also enabled, Sofia can be aware that the message was read by Manuela, even before Manuela decides how to respond.

Related topics

- Manage messaging policies in Teams
- Get started with Teams for Healthcare organizations

Message delegation

11/2/2020 • 2 minutes to read • Edit Online

A user can already explicitly set their status to Away or Do not Disturb, and provide custom text. The message delegation feature works as follows:

1. A user @username mentions another user in part of a text status message, suggesting that while they are unavailable people who want to contact them instead contact the @username mentioned user.
2. The person who has been assigned as a delegate is notified that they were nominated to be a delegate.
3. Someone trying to contact the first user can then hover over the nominated delegate and easily message the delegate instead.

This is a user-initiated process in the client, and no Admin involvement is required to enable the feature.

Delegation use scenario in Healthcare

Usage example without setting delegates: Dr. Franco Piccio is on-call at the radiology department. He receives an urgent personal call and has to step away for the next couple of hours. He asks one of his peers in the radiology department, Dr. Lena Ehrle, to cover for him while he is gone. He informally hands over his pager to Dr. Ehrle, who is listening for urgent messages and pings on the pager and responds to them on behalf of Dr. Piccio in addition to her current responsibilities. Others on the team may not realize the informal delegation happened, and confusion ensues with a patient's care.

Usage example with setting delegates: Dr. Franco Piccio is on-call at the radiology department. He receives an urgent personal call and has to step away for the next couple of hours. He asks one of his peers in the radiology department, Dr. Lena Ehrle to cover for him while he is gone. He changes his custom status message to say something similar to "I am unavailable for the next few hours. Please contact @DrEhrle for any emergencies." Others on the team realize the delegation happened as they're attempting to contact Dr. Piccio, so they now know to contact Dr. Ehrle in the meantime. Little to no confusion ensues with a patient's care.

Impact of co-existence modes on user status in the Teams client

Admins should be aware that status notes and delegation mention behaviors will depend partly on a user's co-existence mode. This matrix shows the possibilities:

CO-EXISTENCE MODE	EXPECTED BEHAVIOR
TeamsOnly	Users can set a note only from Teams. User's Teams note is visible in Teams & SfB.
Islands	User's note set in Teams visible only in Teams. User's note set in SfB visible only in SfB
SfB* modes	Users can set a note only from SfB. User's SfB note is visible in SfB & Teams.

A user can only set a note in Teams if their mode is TeamsOnly or Islands.

Displaying notes set in Skype for Business

There is no visual indication that a note was set from Skype for Business.

Skype for Business doesn't enforce a character limit on status notes. Microsoft Teams will only display the first 280 characters of a note set from Skype for Business. An ellipse (...) at the end of a note indicates truncation.

Skype for Business doesn't support expiry times for notes.

Migration of notes from Skype for Business to Teams is not supported when a user is upgraded to TeamsOnly mode.

Related topics

Coexistence with Skype for Business

Use Teams healthcare templates in the admin center

11/2/2020 • 2 minutes to read • Edit Online

Microsoft Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

For healthcare organizations, templates can be especially powerful, as they provide structure for users to become oriented with how to best leverage Teams effectively. Templates also allow administrators to deploy consistent teams across their organizations. This article is for you if you're responsible for planning, deploying, and managing multiple teams across your Healthcare organization.

We currently offer two first-party healthcare templates that you can use for a variety of situations. To learn more about team templates in general, see Get started with Teams templates in the admin center.

Collaborate on patient care

Streamline healthcare communication and collaboration within a ward, pod, or department. The template can be used to facilitate patient management and operational needs of a ward.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Collaborate on patient care	`healthcareWard`	Channels: • General • Announcements • Huddles • Rounds • Staffing • Training Apps: • Wiki

Hospital

Streamline communication and collaboration between multiple wards, pods, and departments within a hospital. This template includes a set of base channels for hospital operations, and can be self-extended to include specialties, ad-hoc.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Hospital	`healthcareHospital`	Channels: • General • Announcements • Compliance • Custodial • Human resources • Pharmacy Apps: • Wiki

Related topics

Get started with Teams templates

Get started with Teams templates for healthcare organizations

11/2/2020 • 2 minutes to read • Edit Online

Microsoft Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

For healthcare organizations, templates can be especially powerful, as they provide structure for users to become oriented with how to effectively use Teams. Templates also allow administrators to deploy consistent teams across their organizations. This article is for you if you're responsible for planning, deploying, and managing multiple teams across your healthcare organization.

We currently offer two first-party healthcare templates that you can use for a variety of situations. To learn more about team templates in general, see Get started with Teams templates.

Ward template

The ward template is meant for communication and collaboration within a ward, pod, or department. The template can be used to facilitate patient management, as well as the operational needs of a ward. For example, ward announcements can be posted in the *Announcements* channel and shifts can be managed in *Staffing*. If you're looking to streamline your ward operations, then this template is for you.

BASE TEMPLATE TYPE	BASETEMPLATEID	BASELINE TEMPLATE CHANNELS
Healthcare - Ward	`https://graph.microsoft.com/beta/teamsTemplates('healthcareWard')`	Announcements* Huddles* Rounds* Staffing* Training*

* Auto-favorited

Hospital template

The hospital template is meant for communication and collaboration between multiple wards, pods, and departments within a hospital. Included in this template are several operational channels including *Announcements*, *Custodial*, and *Pharmacy*, but we also provide a script below which extends the template with a variety of additional department or specialty-centric channels that you can add to, delete from, or edit to your liking. For example, if you have an *Endocrinology* department, but don't need a channel for *Ophthalmology*, then the script can be adapted to include an *Endocrinology* channel and remove the *Ophthalmology* channel. We recommend that these specialty or ward-modeled channels not be auto-favorited to avoid notification saturation. Users generally favorite any channels that they find relevant.

BASE TEMPLATE TYPE	BASETEMPLATEID	BASELINE TEMPLATE CHANNELS

BASE TEMPLATE TYPE	BASETEMPLATEID	BASELINE TEMPLATE CHANNELS
Healthcare - Hospital	`https://graph.microsoft.com/beta/teamsTemplates('healthcareHospital')`	Announcements* Compliance* Custodial Human Resources Pharmacy

* Auto-favorited

How to use first-party templates

To use these templates, simply change the 'template@odata.bind' property in the request body from 'standard' to the TemplateIDs above. For more information on how to deploy Teams templates, see the Microsoft Graph article on how to create a Team.

> **NOTE**
>
> The channels in the template will automatically be created under the General Tab.

Example: Hospital template extension script

```
{
          "template@odata.bind": "https://graph.microsoft.com/beta/teamsTemplates('healthcareHospital')",
          "DisplayName": "Contoso Hospital",
          "Description": "Team for all staff in Contoso Hospital",
          "Channels": [
            {
              "displayName": "Ambulatory",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "Anesthesiology",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "Cardiology",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "CCU",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "Ear, Nose, and Throat",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "Emergency Care",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "Family Medicine",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "Gynecology",
              "IsFavoriteByDefault": false
            },
            {
              "displayName": "ICU",
```

```
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Mother-Baby",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Neonatal",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Neurology",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Oncology",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Ophthalmology",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "PACU",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Psychiatric",
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            "displayName": "Radiology",
            "IsFavoriteByDefault": false
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            "displayName": "Rehabilitation",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Surgical",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Urology",
            "IsFavoriteByDefault": false
          },
          {
            "displayName": "Women's Health",
            "IsFavoriteByDefault": false
          }
        ],
        "Apps": [
          {
            "Id": "1542629c-01b3-4a6d-8f76-1938b779e48d"
          }
        ]
        }
```


Related topics

Get started with Teams templates

Get started with Teams for Healthcare organizations

Get started with Teams templates in the admin console

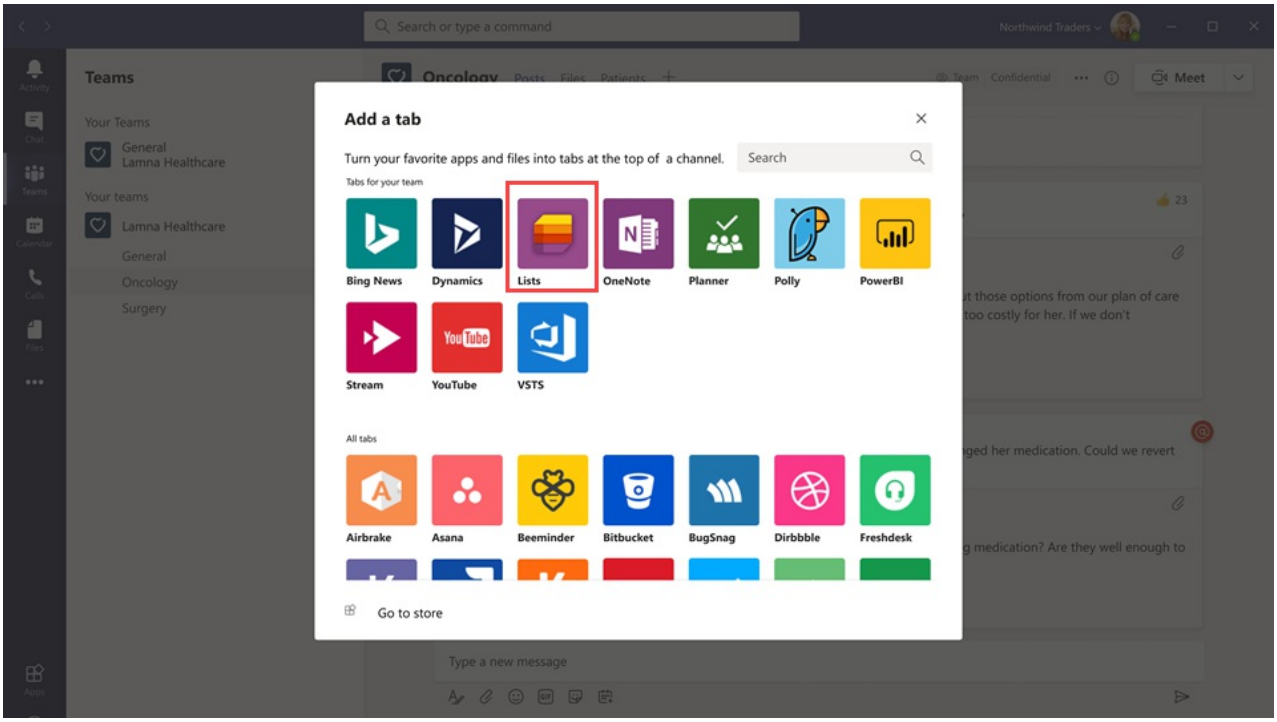
Manage the Lists app for your organization in Microsoft Teams

11/2/2020 • 6 minutes to read • Edit Online

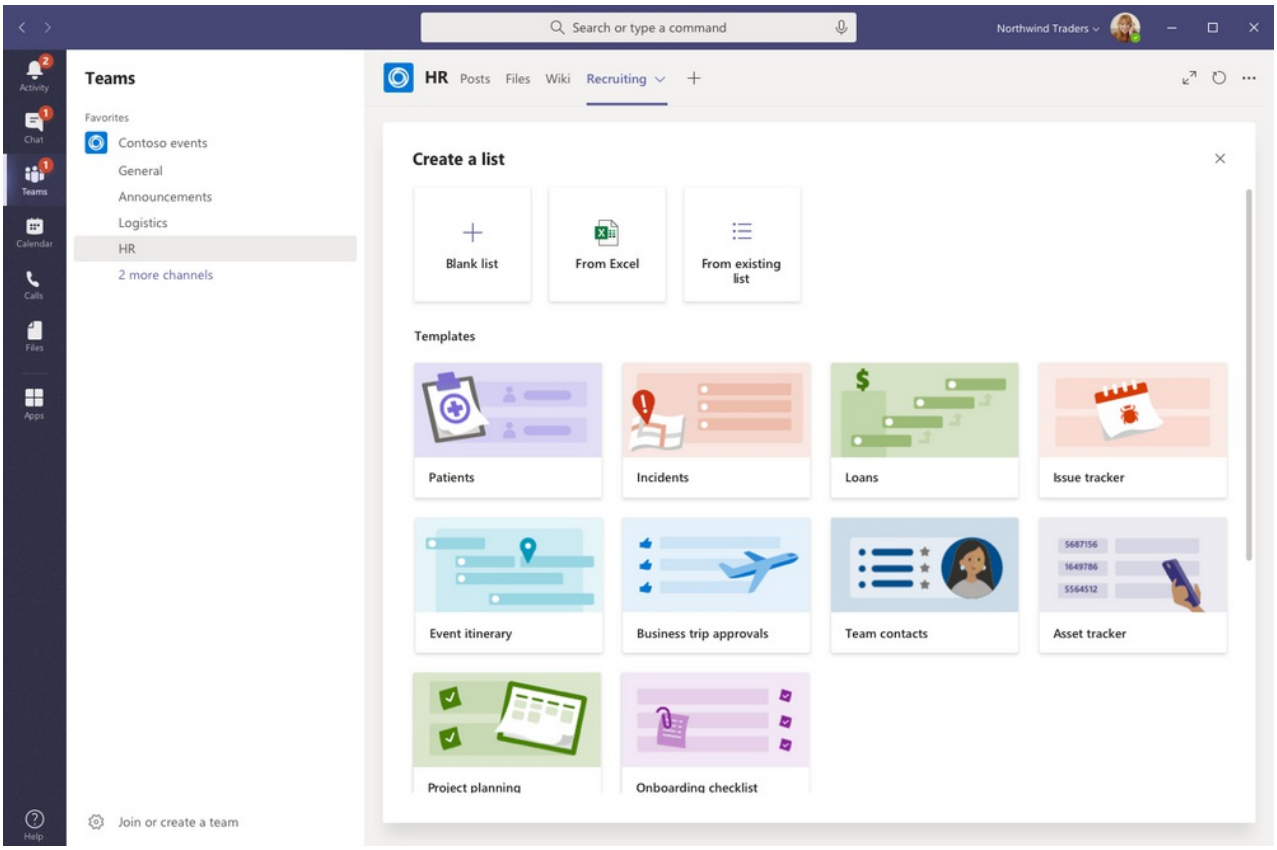
Overview of Lists

The Lists app in Microsoft Teams helps users in your organization track information, organize work, and manage workflows. With Lists, users can track data such as issues, assets, routines, contacts, inventory, incidents, loans, patients, and more using customizable views, rules, and alerts to keep everyone on the team in sync.

In Teams, users access Lists as a tab in a channel. Click + to open the tab gallery and add a new Lists app tab instance to a channel to get started.



Users can create new lists or pin existing lists from within the same team or from a different SharePoint site that they have access to. New lists can be created from scratch, from built-in templates, based on the structure of an existing list, or by importing data from an Excel workbook. The Lists app is available in Teams desktop, web, and mobile clients.



Templates

Templates in Lists are tailored to common information tracking scenarios for users. Each template comes with a predefined list structure, form layouts, and formatting options at both a list view and a details view level to help users get started quickly. After selecting a template, users get a preview of what the list will look like, along with some sample data. Here's some examples of how teams in your organization can use the predefined templates in Lists:

- Track issues and bring them to closure using the Issue tracker template.
- Organize all your event details with the Event itinerary template.
- Use the Patients template to record the needs and status of patients for health teams in your healthcare organization to monitor and coordinate care.
- Track the status of loan applications with the Loans template.

Example scenario

A local post office is responsible for sorting and delivering mail in their district. Each morning, the post office has a team huddle to review daily goals, share announcements, and discuss known incidents.

After the huddle, mail carriers pick up their mail and start their delivery route. Incidents can occur along a route, for example, a vehicle accident, dog-related issue, or social unrest protest. When mail carriers encounter an incident, they use Teams on their mobile devices to record the incident details, which are tracked in a list in the team channel. Everyone on the team, including mail carriers in the field, can see this information and stay informed.

Before moving to Teams, mail carriers had to go back to the post office to complete a hard-copy form to report an incident which was entered in an Excel spreadsheet. Teams gives mail carriers a mobile first, experience where they can use Lists to report incidents in the field as they happen, share incident details with team members, have conversations about them on the channel, and drive incidents to resolution.

What you need to know about Lists

Lists is available in every team and channel

Lists is pre-installed for all Teams users and is available directly in the tab gallery of every team and channel. This means that users don't have to go to the Teams app store to install it.

Lists and SharePoint

Lists data is stored in the SharePoint Online team site. To learn more about how SharePoint Online interacts with Teams, see How SharePoint Online and OneDrive for Business interact with Teams.

Permissions set in SharePoint apply to lists created in the Lists app. By default, lists inherit permissions from the site to which they belong. These permissions govern the types of actions that users can do, such as whether they can create or edit lists. To learn more, see Permission levels in SharePoint and User permissions and permission levels in SharePoint Server.

In certain scenarios, you may want restrict what actions users can do in lists. For example, a person on a team edits a list view, which changes it for all team members, and you want to allow only the team owner or certain team members to edit list views. To learn more, see Customize permissions for a SharePoint list or library.

> **NOTE**
> At this point, owner and member permissions in a team aren't linked in any way to permissions in the team site that govern the behavior of lists or the Lists App. However, based on customer feedback and usage, this will be considered for a future iteration of the product.

Limitations

With Lists, users get a desktop, web, and mobile experience. It's important to know that users can't create new lists or pin existing lists using Lists on the Teams mobile client. To view or edit a list on the Teams mobile client, a list must first be created or added using Lists on the Teams desktop or web client.

Guests can't create or delete a list. They can add list items to existing lists, start new conversations about list items, and reply to existing conversations about list items.

Lists and the SharePoint app

If users in your organization created lists using the SharePoint app, those lists will be automatically moved to Lists without any action needed from the user. To get the best and richest lists integration experience in Teams, use the Lists app and pin your existing lists.

Set up Lists

Enable or disable Lists in your organization

Lists is enabled by default for all Teams users in your organization. You can turn off or turn on the app at the org level on the Manage apps page in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps** .
2. Do one of the following:
   - To turn off Lists for your organization, search for the Lists app, select it, and then click **Block**.
   - To turn on Lists for your organization, search for the Lists app, select it, and then click **Allow**.

Enable or disable Lists for specific users in your organization

To allow or block specific users in your organization from using Lists, make sure Lists is turned on for your organization on the Manage apps page, and then create a custom app permission policy and assign it to those users. To learn more, see Manage app permission policies in Teams.

Search the audit log for list events

Lists are enabled with enterprise-level auditing so you can search for lists and list item events in the audit log in the Security & Compliance Center. To learn more, see Search the audit log in the Security & Compliance Center.

For a list of audit events that are relevant to the Lists app in Teams, see SharePoint list activities.

Before you can search the audit log, you have to first turn on auditing in the Security & Compliance Center. Keep in mind that audit data is only available from the point at which you turned on auditing.

Power Automate, Power Apps, and Graph API

Lists supports Power Automate for workflows and Power Apps for list forms. Developers can use the Lists API to connect list data as a source through Microsoft Graph.

Give feedback or report an issue

To send us feedback or report an issue, click **Help** near the bottom of the left navigation in Teams, and then select **Report a problem**. Select **Lists**, and then enter your feedback or details about the issue you're experiencing.

Related topics

- Lists help documentation

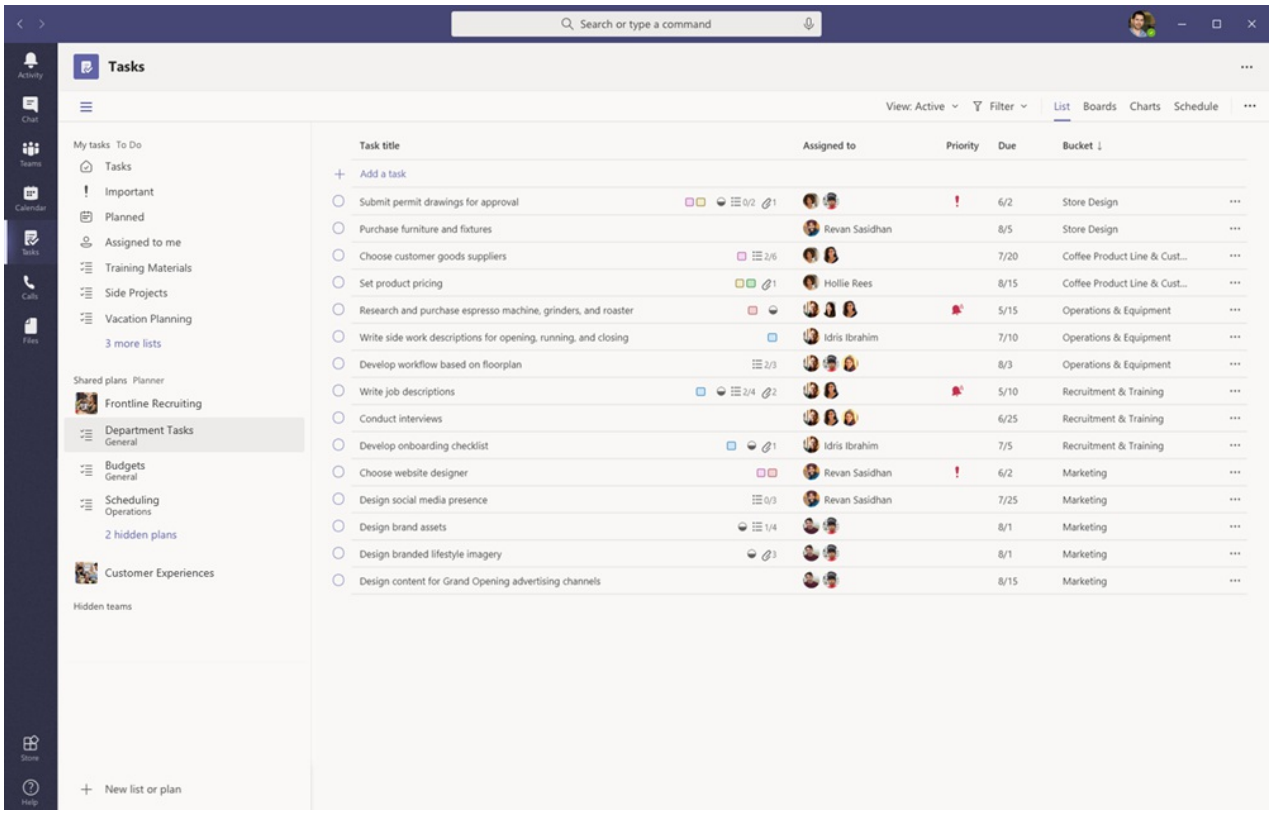
Manage the Tasks app for your organization in Microsoft Teams

12/5/2020 • 8 minutes to read • Edit Online

Overview of Tasks

The Tasks app brings a cohesive task management experience to Microsoft Teams, integrating individual tasks powered by Microsoft To Do and team tasks powered by Planner in one place. Users can access Tasks as an app on the left side of Teams and as a tab in a channel within individual teams. **My tasks** and **Shared plans** in Tasks let users view and manage all their individual and team tasks and prioritize their work. Tasks is available in Teams desktop, web, and mobile clients.

> **NOTE**
>
> As we roll out the Tasks experience on Teams desktop clients, the app name will initially appear as **Planner** to users. The name will then temporarily change to **Tasks by Planner and To Do**, and later on, it will be renamed to **Tasks**. On Teams mobile clients, users will always see the app name as **Tasks**. There may be a short delay in the availability of the mobile experience after the desktop experience is available.



For organizations who want to streamline task management for Firstline Workers, Tasks also includes capabilities that enable you to target, publish, and track tasks at scale across your Firstline Workforce. For example, corporate and regional leadership can create and publish task lists targeted to relevant locations, such as specific retail stores, and track progress through real-time reports. Managers can assign tasks to their staff and direct activities within their locations, and Firstline Workers have a prioritized list of their assigned tasks on mobile or desktop. To enable task publishing, you'll first need to set up a team targeting hierarchy for your organization, which defines how all teams in the hierarchy are related to each other.

What you need to know about Tasks

Tasks is available as an app and as a tab in a channel. Keep in mind that the app comprises both individual tasks from To Do and team tasks from Planner whereas the tab shows only team tasks.

With Tasks, users get a desktop, web, and mobile experience. If Tasks is installed on the Teams desktop client, users will also see it on their Teams web and mobile clients. The exception is guest users. It's important to know that guests can only access Tasks as an app from the Teams mobile client. Guests will see Tasks tabs on both Teams desktop and web clients.

My tasks shows a user's individual tasks. **Shared plans** show tasks that the whole team is working on and includes any task list that's added as a Tasks tab to a channel. Note the following:

- Task lists that a user creates in the Tasks app will also appear in To Do clients for that user. Similarly, task lists that a user creates in To Do will appear in **My tasks** in Tasks for that user. The same is true for individual tasks.
- Any Tasks tab that's added to a channel will also appear in Planner clients. When a user creates a plan in Planner, the plan won't show in the Tasks or Planner app unless it's added as a tab to a channel. When a user adds a new Tasks tab, they can create a new list or plan or choose an existing one.

Set up Tasks

> **IMPORTANT**
> Settings and policies that you configured for Planner will also apply to Tasks.

Enable or disable Tasks in your organization

Tasks is enabled by default for all Teams users in your organization. You can turn off or turn on the app at the org level on the Manage apps page in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps** .
2. In the list of apps, do one of the following:
   - To turn off Tasks for your organization, search for the Tasks app, select it, and then click **Block**.
   - To turn on Tasks for your organization, search for the Tasks app, select it, and then click **Allow**.

> **NOTE**
> If you can't find the Tasks app, search for the names in the first note of this article. The app could still be in the process of being renamed.

Enable or disable Tasks for specific users in your organization

To allow or block specific users in your organization from using Tasks, make sure Tasks is turned on for your organization on the Manage apps page, and then create a custom app permission policy and assign it to those users. To learn more, see Manage app permission policies in Teams.

Use an app setup policy to pin Tasks to Teams

App setup policies let you customize Teams to highlight the apps that are most important for users in your organization. The apps you set in a policy are pinned to the app bar—the bar on the side of the Teams desktop client and at the bottom of the Teams mobile clients—where users can quickly and easily access them.

To pin the Tasks app for your users, you can edit the global (Org-wide default) policy or create and assign a custom app setup policy. To learn more, see Manage app setup policies in Teams.

A user's My tasks is visible if the user is licensed for Exchange Online

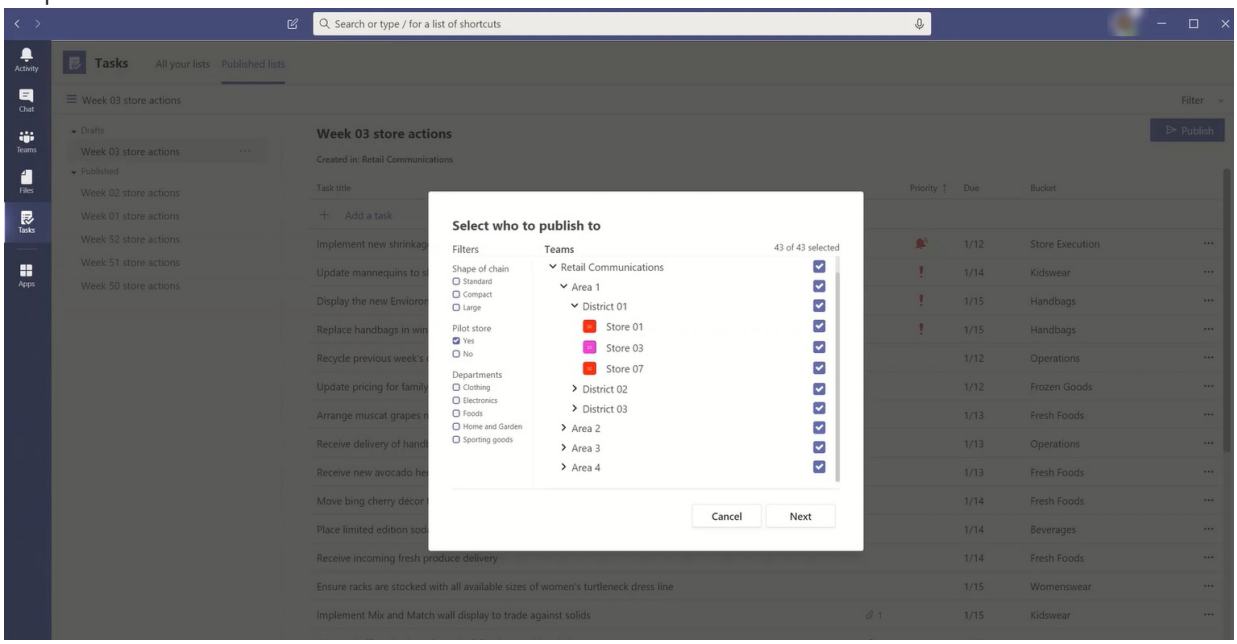
If you don't want a user to see **My tasks**, you can hide it. To do this, remove the user's Exchange Online license. It's important to know that after you remove an Exchange Online license, the user no longer has access to their mailbox. Mailbox data is held for 30 days, after which the data will be removed and can't be recovered unless the mailbox is placed on In-Place Hold or Litigation Hold.

We don't recommend this for information workers, but there may be some scenarios where this could apply, such as for Firstline Workers who don't depend on email.

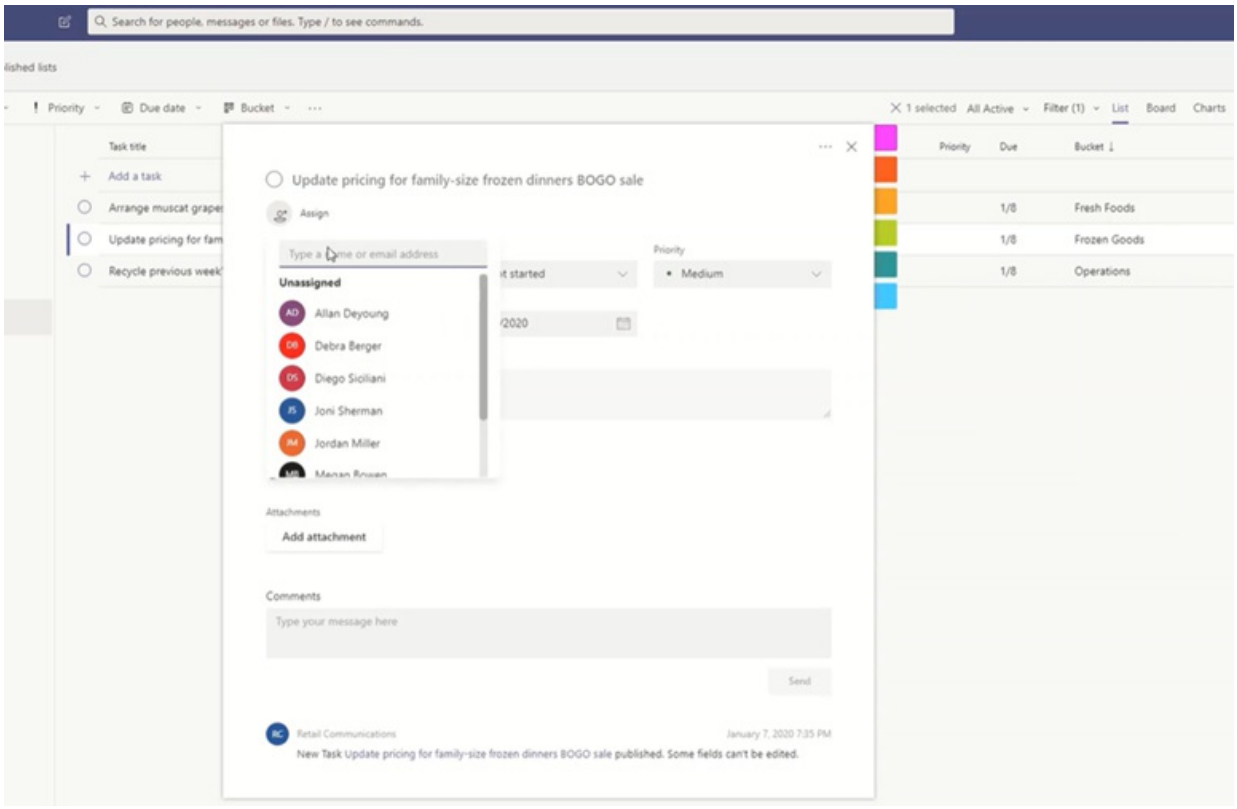
Task publishing

With task publishing, your organization can publish task lists targeted to specific locations (teams) across your organization to define and share a work plan to be completed at those locations.

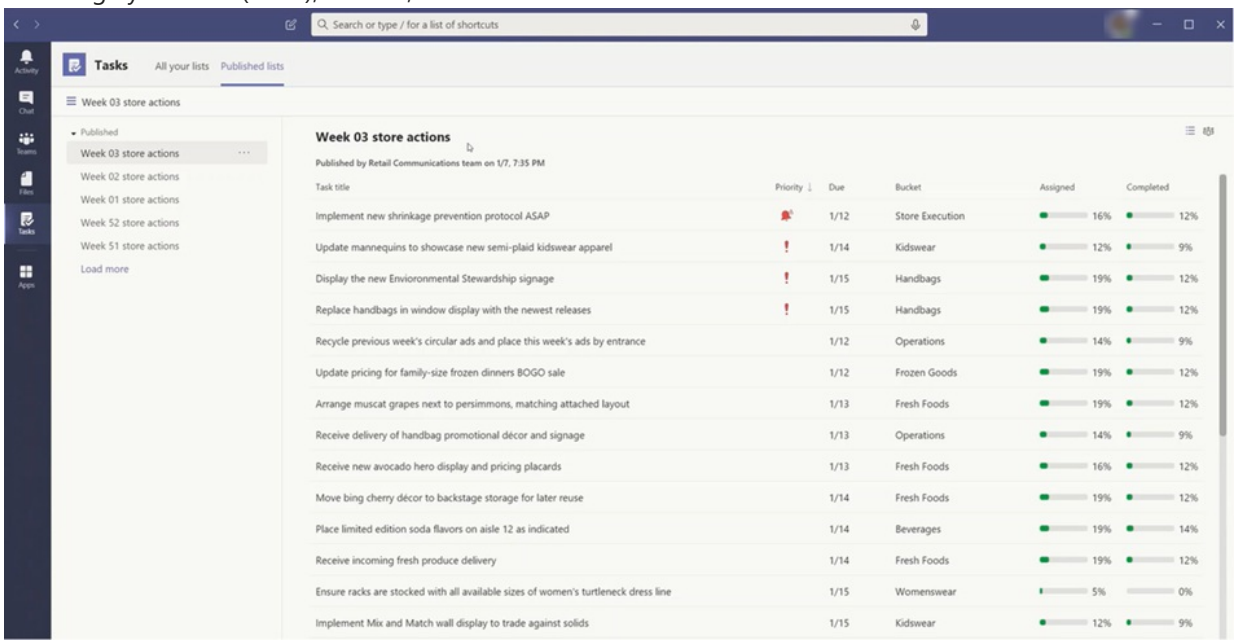
- People on the publishing team, such as corporate or regional leadership, can create task lists and publish them to specific teams.



- Managers on the recipient teams can review the published task lists and assign individual tasks to team members.



- Firstline Workers have a simple mobile experience to see tasks assigned to them. They can attach photos to show their work when appropriate and mark their tasks as completed.
- Publishers and managers can view reports to see assignment and completion status of tasks at each level, including by location (team), task list, and individual task.



Users create, manage, and publish task lists on the **Published lists** tab in the Tasks app. This tab only shows for a user if your organization set up a team targeting hierarchy and the user is on a team that's included in the hierarchy. The hierarchy determines whether the user can publish or receive task lists and view reporting for received lists.

Example scenario

Here's an example of how task publishing works.

Contoso is rolling out a new food takeout and delivery promotion. To maintain a consistent brand experience, they need to coordinate consistent execution of the rollout across over 300 store locations.

The Marketing team shares the promotion details and the corresponding list of tasks with the Retail

Communications Manager. The Retail Communications Manager, who serves as the gatekeeper for stores, reviews the information, creates a task list for the promotion, and then creates a task for each unit of work that needs to be performed by each of the affected stores. When the task list is complete, she needs to select the stores that must complete the work. In this case, the promotion only applies to stores in the United States that have an in-store restaurant. In Tasks, she filters the store list based on the in-store restaurant attribute, selects the matching United States locations in the hierarchy, and then publishes the task list to those stores.

Store managers at each location receive a copy of the published tasks and assign those tasks to their team members. Managers can use the Tasks experience to understand all the work required across their store. They can also use the available filters to focus on a specific set of work, such as work due today or work in a particular area.

Firstline Workers at each store location now have a prioritized list of their work in Tasks on their mobile device. When they finish a task, they mark it complete. Some may even choose to upload and attach a photo to the task to show their work.

Contoso headquarters and intermediate managers can view reporting to see the assignment and completion status of tasks at each store and across stores. They can also drill down to a specific task to see the status within different stores. As the launch date gets closer, they can spot any abnormalities and check in with their teams as needed. This visibility allows Contoso to improve the efficiency of the rollout and provide a more consistent experience across their stores.

Set up your team targeting hierarchy

To enable task publishing in your organization, you have to first set up your team targeting schema in a .CSV file. The schema defines how all the teams in your hierarchy are related to each other and the attributes used to filter and select teams. After you create the schema, upload it to Teams to apply it to your organization. Members of the publishing team, such as the Retail Communications Manager in the example scenario, can then filter teams by hierarchy, attributes, or a combination of both to select the relevant teams that should receive the task lists, and then publish the task lists to those teams.

For steps on how to set up your team targeting hierarchy, see Set up your team targeting hierarchy.

Power Automate and Graph API

Tasks supports Power Automate for To Do and Graph APIs for Planner. To learn more, see:

- Planner tasks and plans API overview
- Using Microsoft To Do with Power Automate

Shifts for Teams

12/5/2020 • 2 minutes to read • Edit Online

Teams gives Firstline Workers in your organization the tools they need to communicate and collaborate effectively and do their best work. Here you'll find the admin guidance you need to set up and manage Shifts, the schedule management tool, in Teams.

Set up and manage Shifts for your organization

	**Manage Shifts in your organization**		**Shifts Help for Firstline Workers**

Shifts extensions

	**Shift Graph APIs** Shifts Graph APIs allow you to integrate Shifts data with external workforce management systems, providing you the flexibility to build custom Shifts experiences in the back end, while giving users a rich, front-end experience in Teams.
	**Workforce management integrations** If you're using third-party workforce management systems, such as Kronos and JDA, for scheduling, time, and attendance, you can integrate directly with Shifts through Shifts Graph APIs and SDK with open source integrations.
	**Shifts + Power Automate** Shifts + Power Automate lets you take info from Shifts and create custom workflows with other apps and perform operations at scale. Automate key processes with little to no code. The triggers and templates support a variety of scenarios such as enabling auto-approvals for shift requests when a manager's approval isn't needed.

Featured training

	Video: What is Shifts?		Video: What is Shifts?		Video: Manage a Shifts schedule

Manage the Shifts app for your organization in Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

IMPORTANT

Effective June 30, 2020, Microsoft StaffHub has been retired. We're building StaffHub capabilities into Microsoft Teams. Today, Teams includes the Shifts app for schedule management and additional capabilities will roll out over time. StaffHub stopped working for all users on June 30, 2020. Anyone who tries to open StaffHub is shown a message directing them to download Teams. To learn more, see Microsoft StaffHub has been retired.

Overview of Shifts

The Shifts app in Microsoft Teams keeps Firstline Workers connected and in sync. It's built mobile first for fast and effective time management and communication for teams. Shifts lets Firstline Workers and their managers use their mobile devices to manage schedules and keep in touch.

- Managers create, update, and manage shift schedules for teams. They can send messages to one person ("there's a spill on the floor") or the entire team ("the regional GM is arriving in 20 minutes"). They can also send policy documents, news bulletins, and videos.
- Employees view their upcoming shifts, can see who else is scheduled for the day, request to swap or offer a shift, and request time off.

It's important to know that Shifts currently doesn't support guest users. This means that guests on a team can't be added to or use shift schedules when Guest access is turned on in Teams.

NOTE

For details about Shifts capabilities on different platforms, see Teams features by platform.

Availability of Shifts

Shifts is available in all Enterprise SKUs where Teams is available.

Location of Shifts data

Shifts data is currently stored in Azure in data centers in North America, Western Europe, and Asia Pacific. For more information about where data is stored, see Where is my data?

Set up Shifts

Enable or disable Shifts in your organization

Shifts is enabled by default for all Teams users in your organization. You can turn off or turn on the app at the org level on the Manage apps page in the Microsoft Teams admin center.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Manage apps** .
2. In the list of apps, do one of the following:

- To turn off Shifts for your organization, search for the Shifts app, select it, and then click **Block**.
- To turn on Shifts for your organization, search for the Shifts app, select it, and then click **Allow**.

Enable or disable Shifts for specific users in your organization

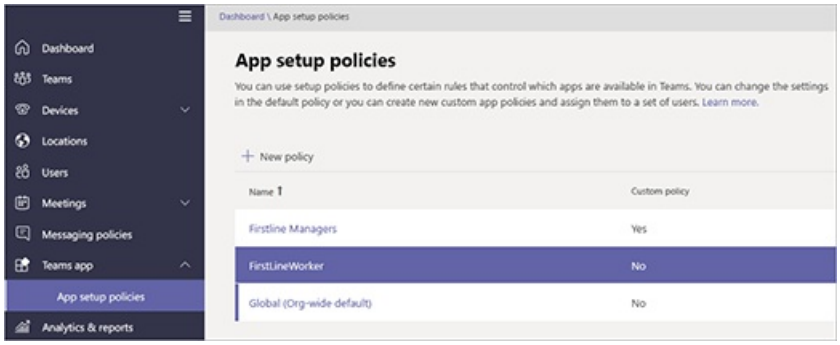
To allow or block specific users in your organization from using Shifts, make sure Shifts is turned on for your organization on the Manage apps page, and then create a custom app permission policy and assign it to those users. To learn more, see Manage app permission policies in Teams.

Use the FirstlineWorker app setup policy to pin Shifts to Teams

App setup policies let you customize Teams to highlight the apps that are most important for users in your organization. The apps set in a policy are pinned to the app bar—the bar on the side of the Teams desktop client and at the bottom of the Teams mobile clients—where users can quickly and easily access them.

Teams includes a built-in FirstlineWorker app setup policy that you can assign to Firstline Workers in your organization. By default, the policy includes the Activity, Shifts, Chat, and Calling apps.

To view the FirstlineWorker policy, in the left navigation of the Microsoft Teams admin center, go to **Teams app** > **App setup policies**.



Assign the FirstlineWorker app setup policy to users

You can assign a policy directly to users, either individually or at scale through a batch assignment (if supported for the policy type), or to a group that the users are members of (if supported for the policy type).

To learn about the different ways that you can assign policies to users, see Assign policies to your users in Teams.

Search the audit log for Shifts events

(in preview)

You can search the audit log to view Shifts activity in your organization. To learn more about how to search the audit log and to see a list of Shifts activities that are logged in the audit log, see Search the audit log for events in Teams.

Before you can search the audit log, you have to first turn on auditing in the Security & Compliance Center. To learn more, see Turn audit log search on or off. Keep in mind that audit data is only available from the point at which you turned on auditing.

Related topics

- Shifts Help for Firstline Workers
- Assign policies to your users in Teams

Teams for Education

11/2/2020 • 2 minutes to read • Edit Online

With Teams, educators and faculty can create collaborative classrooms, connect in professional learning communities, and communicate with students and educators. Use the admin resources here to help you successfully deploy, adopt, and manage Teams in your school or institution.

	Quick start - Teams for Education admins
	Assignments in Teams for Education
	Insights in Teams for Education
	Resources for Teams for Education admins
	Governance FAQ for Teams for Education admins

Get started with Microsoft Teams for remote learning

12/5/2020 • 18 minutes to read • Edit Online

For an overview of making the transition to remote learning and resources to help you get started, see our remote learning home page.

Resources to assist educators and students with remote learning are available in Remote teaching and learning in Office 365 Education.

This article covers the actual steps to take in order to get your educational institution set up for remote learning.

> **NOTE**
>
> For details about remote learning capabilities on different platforms, see Teams features by platform.

> **NOTE**
>
> If you're an educator, educational leader, or IT professional, these resources may help:
>
> - Get your entire educational institute up and running on Teams quickly with the **Getting Started one-pager**.
> - Download **How to get started with Teams**: A guide for IT professionals with helpful practices for security and change management.
> - A collection of articles written for educators including how-to guidance for the most important **first steps in teaching in Teams**.
> - A 1-hour online course in the Microsoft Educator Center shows how educators use Teams in their professional lives. **Transform Learning with Microsoft Teams**.
> - A 1-hour online course in the Microsoft Educator Center leads educators through teaching in Class Teams. **Crafting a Collaborative Learning Environment with Class Teams**.
> - If you're an educator, student, or a parent or guardian, get more guidance on **teaching and learning remotely with Office 365**.
> - Parents and guardians can also go to our **Parent Support Page** for help with remote learning.

Don't miss the March 4, 2020 blog, How schools can ramp up remote learning programs quickly with Microsoft Teams.

Learning online can be just as personal, engaging and socially connected as learning in a classroom. Students and educators can stay in touch and help each other using conversations, and can feel like they are meeting in person using live meetings. Educators can track student progress in their daily work using Assignments. No one needs to feel out of touch. Many students who learn online say they feel they have more of a voice, and they feel more connected to their educators and peers than they did in the classroom. And, just like in a classroom, educators can use the apps and functions of Teams to support how they work best.

Microsoft Teams is a digital hub that brings conversations, content, assignments, and apps together in one place, letting educators create vibrant learning environments. Build collaborative classrooms, connect in professional learning communities, and connect with colleagues – all from a single experience.

Within Teams, educators can quickly converse with students, share files and websites, create a OneNote Class Notebook, and distribute and grade assignments. Built-in OneNote Class Notebooks and end-to-end assignment management allow educators to organize interactive lessons and provide effective and timely feedback. Educational institute administrators and staff can stay up-to-date and collaborate using Staff Teams for announcements and topical conversations. Educators can share instructional material using Professional Learning

Communities.

Use the best practices in this article to start using Teams for your educational needs to enable remote learning capabilities. Class Teams can be used to create collaborative class spaces, provide a virtual meeting platform, facilitate learning with assignments and feedback, and lead live calls with students.

Teams has clients available for desktop (Windows, Mac, and Linux), web, and mobile (Android and iOS) to make sure all your staff and students can stay connected.

Learn more about Teams usage scenarios at the Teams for education webinar series.

User accounts, licenses, and identity security

Teams leverages Microsoft 365 capabilities to authenticate users and provide services. Staff, instructors, and students should have identities established to facilitate collaboration. If identities do not already exist, follow this process to establish them.

Teams licenses need to be enabled for users and then licenses need to be assigned to the users before they can use Teams capabilities. Teams relies on additional Microsoft 365 capabilities such as Microsoft 365 groups, Exchange, SharePoint and OneDrive to enable collaborative scenarios. Users receive the best Teams experience if all these services are also enabled. Teams is supported for users who have email hosted by Google.

Microsoft Teams is included in Office 365 A1, which is free for educational institutions. For IT guidance on how to deploy Office 365 and get your entire educational institution started on Teams, check out this page. For support, you can file a ticket here and for trainings on Teams, visit your local Microsoft Store to speak with a Specialist.

> **NOTE**
> Please review Updated Guidance for M365 EDU Deployment during COVID-19 for our latest information on EDU deployments.

Easily set up Teams

These are the two things you need to do to get up and running with Teams:

1. Allow users to create teams

Students and educators will get the most out of Teams when they can use it with minimal barriers and have the flexibility to tailor it to their needs. One way users can tailor their Teams experience is by having the ability to create teams that meet their needs. **By default, everyone can create Microsoft 365 groups and Teams**. There are times when this capability may not be appropriate; for example, some customers may want to restrict primary-secondary students from creating Teams. If needed, Microsoft 365 group and Team creation can be restricted to certain security groups within your environment.

Higher education institutions benefit when you let everyone, including students, create teams for classes, research, group projects, and study groups. Primary-secondary schools may want to restrict students from creating Teams to make sure that all student to student communications are happening within a forum that include an adult. In this case, Microsoft 365 group and Team creation can be restricted to all educators and staff.

For a walkthrough of how to create Teams, check out: Create a class team in Microsoft Teams.

2. Configure user experiences using policies

IMPORTANT

You can run the Teams for Education Policy Wizard to easily apply policies for your students, educators and staff. The tool adjusts the Global (Org-wide default) policy definition of a core set of policies with settings that we recommend for student safety and applies it to students. The tool also creates and assigns a set of custom policies to educators and staff. If you already used the wizard to apply policies for your students, educators and staff, use this article as a reference or *only* if you want to manually create and manage policies for your students, educators and staff.

NOTE

To learn more about the actions you must take to protect students, you can check out the Keeping students safe in Teams for distance learning. If you want to deep dive into our admin EDU policy recommendations, you should go to Teams policies and policy packages for Education.

Teams policies provide the ability to control the options available for specific users or groups of users. Policies can be applied to define who should be allowed to use private chat, private calling, meeting scheduling, content types that can be shared, and more.

Higher education staff, educators, and students benefit from the capabilities included with the default (global) policies. Some additional policy settings can be enabled to add more functionality to Teams, including enabling translate capabilities in the messaging policy and allowing for automatic meeting transcription in the meeting policy.

Primary-secondary school students may need restricted capabilities provided to students. Policies set boundaries on what the students can do. Because the student population is often the largest set of users and they often receive the most restrictive settings, it is recommended that student policy changes be made to the 'Global (Org-wide default)' polices.

IMPORTANT

For meeting policies assigned to any users, we recommend setting the "Automatically admit people" setting to "Everyone in your organization". This setting will ensure that non-authenticated users must be admitted from the lobby before they can join Teams meetings. For more information, check out Manage meeting policies in Teams.

Primary school staff and educators should be assigned policies that grant the core capabilities that may be restricted for students. Create new policies that allow the for private chat and meeting scheduling (the default settings for a new policy). Assign these policies in bulk to your staff and educators.

Start using Teams

Create class teams for secure classroom use

Microsoft Teams for Education offers specific team types for educational use. The Class team type is designed for classroom use and comes with specific features that support classroom needs including:

- Assignments
- Grades
- OneNote classroom notebook
- Class Materials folder for securing read-only content for students
- Insights to provide real-time data regarding student's engagement, assignments, and well-being for each classroom.
- Early educator access to set up the class before students are added
- The ability to mute disruptive students and other special permissions

There are a few ways in which class teams can be created, and Teams for Education has a unique set of deployment tools to make it as easy as possible.

- Automatic team creation using SDS
- Educator-led team creation from Office 365 class groups
- PowerShell script using Graph APIs
- Manual team creation

We'll step through various options to help you choose the right deployment path that best fits your needs.

Automatic team creation using SDS

Automating team creation saves both IT admins and educators time. It ensures that educators have all their class teams created and ready to set up upon sign in. School Data Sync (SDS) is a free Office 365 Education tool that reads the data from an educational institution's system of record, for example a Student Information System (SIS) or Learning Management system (LMS). SDS uses the data to enrich Office 365 setup in many ways, including creating class teams in bulk and staying in sync with your information system to keep your instructor and student membership updated as enrollment changes. SDS can import data from any system of record and has built-in connectors to many of the world's existing SIS vendors. We highly recommend using SDS, as it provides the following benefits.

Benefits

- Automatic creation and maintenance of class teams – educators will be able to sign in to Teams and immediately start teaching.
- Membership sync with SIS/LMS to maintain student membership changes.
- EDU Customer Success Team available for free deployment assistance.
- Early educator access: Educators have time to prepare their team before admitting students.
- Optionally creates users and applies Office 365 licenses.
- Creates security groups for use across Office 365 including Teams policy.
- Creates Administrative Units for scoped administrative delegation and Teacher Password Reset.
- Built-in error and retry handling, throttling backoff, and session stability for large scale processing to reduce work on admins.
- Built-in cleanup capabilities to rename and archive groups and teams once they are obsolete.
- Grade Sync: Educators can do all their grading in Teams and have it automatically write grades from Teams back to the SIS gradebook.
- Student Data Protection: Prevent students from using non-Microsoft apps and to track and manage parent consent.
- Imported data is used to enrich Education Insights with user roles, organizations (schools) and other important data.

Considerations

SDS creates teams in two steps. The first step creates a Microsoft 365 group in Azure Active Directory (Azure AD) and the second step automatically turns that group into a team. The second step of creating teams is optional in SDS. An admin may not want to automatically create teams depending on deployment time and the number of unused teams that may result. We recommend institutions with 500,000 teams or more to turn off the automatic team creation toggle in SDS and use the educator-led team creation method.

Get started

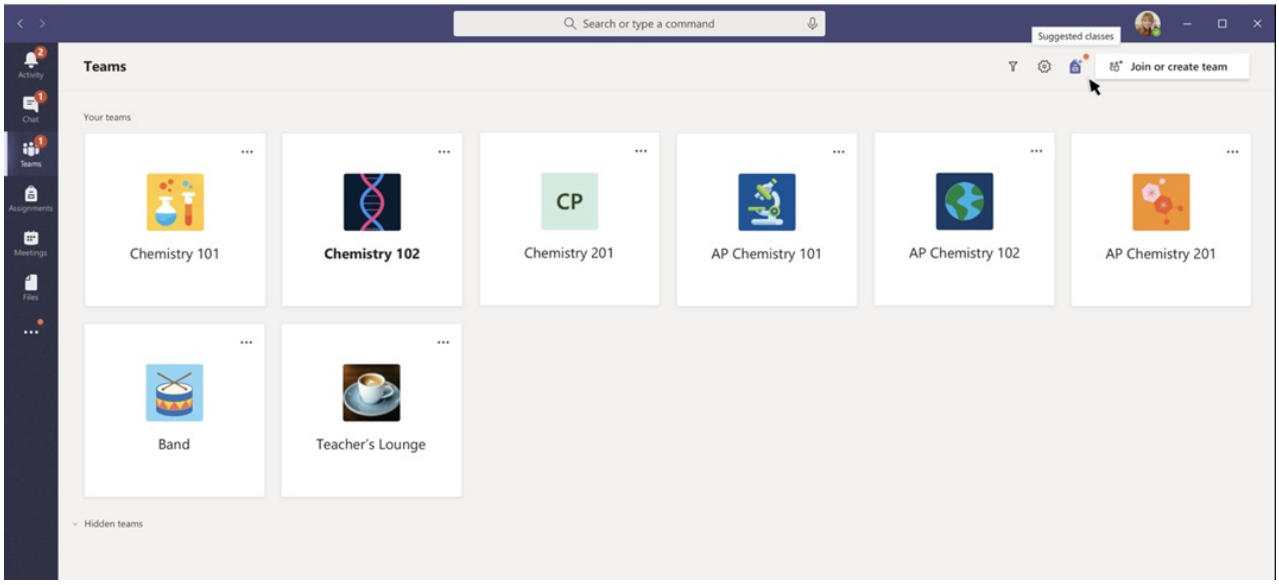
To get started, go to School Data Sync (SDS) and contact https://aka.ms/sdssupport deployment assistance.

Educator-led team creation from Office 365 class groups

Educator-led team creation is a great deployment option if you want to make it easy for educators to quickly create the classes they need. We also recommend that institutions with more than 500,000 teams use this method to minimize the number of extraneously-created teams.

This hybrid approach allows you to either use SDS to create groups for each class (recommended) or use Graph

API to create them on your own. After class groups are prepared, educators can convert their groups into teams by using the **Suggested classes** icon.



Benefits

- Early educator access: Educators have time to prepare their team before admitting students.
- Reduces the number of unused and unnecessary teams. The classes are prepared and suggested but not created unless the teacher intends to use them. We recommend this option for large institutions that have more than 500,000 teams to reduce clutter.
- SDS
  - Membership sync with SIS/LMS to maintain student membership changes.
  - EDU Customer Success Team available for free deployment assistance.
  - Optionally creates users and applies Office 365 licenses.
  - Creates security groups for use across Office 365 including Teams policy.
  - Creates Administrative Units for scoped administrative delegation and Teacher Password Reset.
  - Built-in error and retry handling, throttling backoff, and session stability for large scale processing to reduce work on admins.
  - Built-in cleanup capabilities to rename and archive groups and teams once they are obsolete.
  - Grade Sync: Educators can do all their grading in Teams and have it automatically write grades from Teams back to the SIS gradebook.
  - Student Data Protection: Prevent students from using non-Microsoft apps and to track and manage parent consent.
  - Imported data is used to enrich Education Insights with user roles, organizations (schools) and other important data.
- Graph API
  - Additional flexibility and control.
  - Doesn't require integration with SDS.

Considerations

- Not fully automated and requires some educator action.
- Educators who don't have permission to create teams can still create teams from existing groups as shown here.
- Graph API requires a high level of technical expertise and time to create and run the script and fix any issues when creating class groups.

Get started

To get started with the SDS method, go to School Data Sync (SDS) and contact https://aka.ms/sdssupport deployment assistance.

To use the Graph API method, see Graph API and Create a class team.

> **NOTE**
>
> To use this method with SDS, you'll need to turn the automatic team creation toggle off in your SDS profile. You can also use a combination of automatic and educator-led team creation for required and optional class teams by using two SDS profiles.

PowerShell script using Graph APIs

With PowerShell, you can write a script to create teams, channels and configure settings automatically. It requires the admin to first create the group, add educators and students, and then create the team as outlined here. You can also use the Microsoft Graph API to create, configure, clone, and archive teams. For more information, see Use the Microsoft Graph API to work with Microsoft Teams, Microsoft Teams PowerShell and Create a class team. Using Graph APIs is a great way to have more control and flexibility, however, it requires a high level of technical expertise and takes more time to set up initially.

Benefits

- Additional flexibility and control.
- Option to create early educator access teams or immediate student access to teams.
- If you create teams from groups, educators will have early access and student membership changes to the Azure AD group will be synced.

Considerations

- Requires a high level of technical expertise and time to create and run the script and fix any issues when creating class groups.
- No built-in error handling or retry logic.
- Membership changes are not synced with SIS.

> **NOTE**
>
> Class teams require hidden group membership so only educators and students within the class can see the members of that class. To create an Office 365 class group, see Create a class team to meet the same privacy requirements.

Manual team creation

Students and educators will get the most out of Teams when they can use it with minimal barriers and have the flexibility to tailor it to their needs. One way users can tailor their Teams experience is by having the ability to create teams. Educators set up their own class type team and invite students as shown here. Educators can invite students by adding students to the team, sharing a join code, or sharing a link to the team. If possible, it's best to have educators add their students to the team to ensure the students get access and are notified that they've been added to a team.

Benefits

- Additional flexibility for educators.
- Immediate team creation and access.

Considerations

- Requires educator action and time.
- Student membership is not synced with SIS and requires manual management.
- Doesn't give educators early access to their teams. Students will gain immediate access.

Recommended best practices

- Deploy early! Deploy early to ensure everything is working reliably and ready for the first day of school.
- If you have more than 500,000 teams, we recommend using the educator-led team creation method. It reduces unused teams and clutter by only creating class teams that are relevant and needed.
- If there are any issues (for example, classes are missing) with SDS automatic team creation and educators need

them immediately, then they can use the educator-led team creation method to retry. Manual team creation is another solution, however, it won't keep your team membership updated.

- The tenant team limit is 500,000 teams. Therefore, admins should proactively try to reduce the number of unused teams to avoid hitting these limits and extending their setup time. For more information about limits, see Limits and specifications for Microsoft Teams.

Early access to class teams

Early Access Class Teams allows educators access to their class teams before their students can view it and begin participating. This allows educators time to set up, add files, and get organized before granting access to their students. When they are ready for students to access the team, they can easily activate their class. As an admin, you also have additional control and capabilities around creating and setting up Early Access Class Teams.

How do I create class teams that allow educators early access to set up a team before admitting students?

Teams created from groups (through SDS, educator-led or Graph API) automatically create early access teams by default. To create your own early access teams using Graph API, you'll need to create a class and create the team from a group.

How do I check if a class is activated?

In the team resource type, we added a new property, isMembershipLimitedToOwners, to determine whether a class is activated. Use the Get Team API to query the `isMembershipLimitedToOwners` property for a specific class. If the team is activated, it will return a value of false. If the team hasn't been activated by the team owner, it will return a value of true.

How do I activate a class for an educator?

Use the Update Team API and set the `isMembershipLimitedToOwners` property to false to activate the team on your educator's behalf. Note that after a team is activated, it can't be reversed.

Create staff teams for staff communication and collaboration

Staff type teams are designed for educational institute administrators and staff to easily share information and work together on institute-wide initiatives, including making announcements, settings up meetings, sharing content, and bringing in external apps, like Planner for task tracking. Educational institute administrators can add staff members to the team via the team creation wizard, adding members after the team is created, or by sharing a join code or link to the team. Creating channels is a great way to organize conversation and files by workstream or subject. The Go-to guide for team owners is an excellent place to learn about team owner duties and capabilities.

Teams meeting scenarios

Collaborative meetings for virtual classes

Microsoft Teams meetings support up to 250 concurrent attendees, including the ability to have audio, video, content sharing, whiteboards, and shared notes. Meetings can be scheduled within the Teams client for meeting within a private space or within a team channel, so all team members know about it. Meetings can be recorded and saved for attendees to review later. These recordings can also be transcribed to easily find content that had been discussed. A laptop or mobile phone webcam, microphone, and speaker can be used for meetings, and you can get premium audio/video quality from Microsoft Teams optimized devices.

In Teams, meeting organizers can end a meeting for all participants. With this capability, educators can ensure that students don't stay in a meeting unsupervised after a class is finished.

District/University events or updates

Some instruction needs larger audiences and additional production capabilities. These meetings often have defined presenters, producers, and moderated Q&A. Teams supports these sessions using Microsoft Teams live events. Live Events can be used for scenarios, such as district or university-wide updates, leadership addresses, and for instruction to large classes or student groups, or extend to your community. Learn more about conducting live sessions at: plan and schedule a live event, produce a live event, attend a live event, and moderating a Q&A.

Recommended Tips & Tricks

You can learn more about how Teams is used in Education at: Microsoft Teams for Education.

> **NOTE**
>
> Some key Teams features are not specific to education. Tips and tricks for core Teams capabilities can be found at: Teams Help and Learning.

Prevent users from changing their profile photo

Teams honors the Outlook on the web mailbox policy setting that's configured by tenant admins to control whether users can change their profile picture. If the **-SetPhotoEnabled** setting is turned off, users can't add, change, or remove their profile picture. To prevent students or staff from changing or removing their profile picture, turn off this setting in the Outlook on the web mailbox policy that's assigned to them.

For example, if a student uploads a profile picture that's approved by your educational institute's IT or HR department, no action is needed. However, if a student uploads a picture that's inappropriate, change the picture according to your educational institute's internal policies.

Adoption content

Microsoft has developed adoption content and strategy guidance for deploying Teams. The Teams adoption guide provides a good overview of available content and the Teams Customer Success Kit provides many templates that can be used for Teams awareness. The Microsoft Educator Center provides education specific training on how Microsoft Teams and OneNote are used in the classroom.

Additional adoption resources include:

- "You can in :90" quick tip videos
- Teams for Education video playlist
- BLOG: See how this school uses Teams for distance learning

Support Readiness

IT professionals and support staff can get up to speed with Teams architecture and underlying use of Microsoft 365 capabilities with the Teams IT architecture posters and admin technical training.

Additional support resources include:

- Teams Troubleshooting
- Troubleshoot Microsoft Teams installation and update issues
- File a support ticket (can be used by educators and staff)
- Support and Help center for educators using Teams
- Student Help center
- Teams for Virtualized Desktop Infrastructure
- How to quickly optimize Office 365 traffic for remote staff
- Monitor and manage call quality
- Verify service health for Teams
- Support resources for Teams
- Teams help center

Teams policies and policy packages for Education

12/5/2020 • 10 minutes to read • Edit Online

IMPORTANT

You can run the Teams for Education Policy Wizard to easily apply policies for your students, educators and staff. The tool adjusts the Global (Org-wide default) policy definition of a core set of policies with settings that we recommend for student safety and applies it to students. The tool also creates and assigns a set of custom policies to educators and staff. If you already used the wizard to apply policies for your students, educators and staff, use this article as a reference or *only* if you want to manually create and manage policies for your students, educators and staff.

NOTE

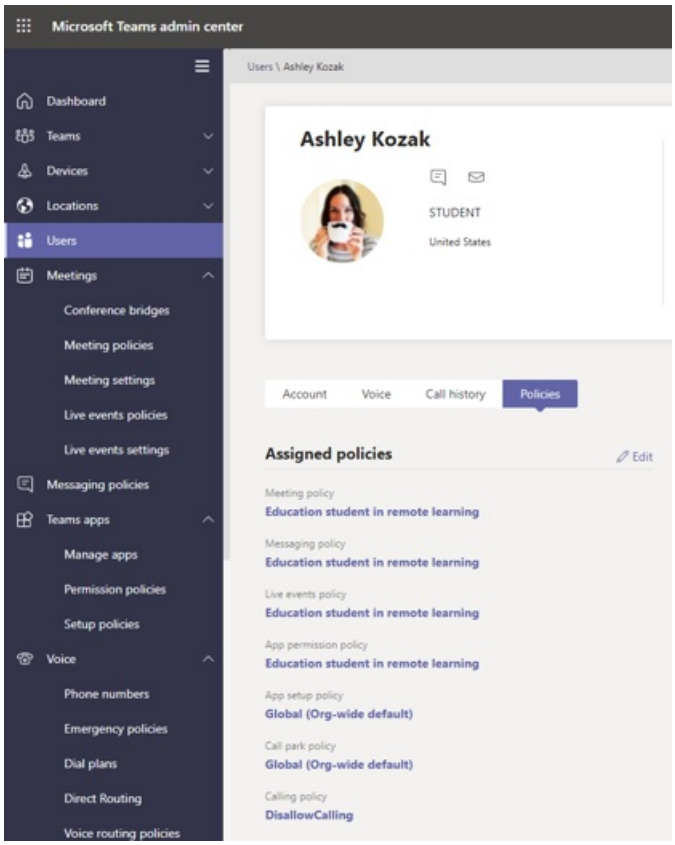
For the larger story on policies in Microsoft Teams, please review Assign policies to your users in Microsoft Teams.

Admins: Getting started with Microsoft Teams policy management

Microsoft Teams allows users to do things like attend online meetings or live events, chat, make calls, and use apps. Setting the right Microsoft Teams admin policies is a critical step in ensuring that Teams is a safe learning environment for students. As an admin, you can use policies to control the Teams features that are available to users in your educational institute. In most cases, policies must be adjusted for both students and educators to keep the environment safe.

Here's a list of the main policy areas you will find in Microsoft Teams. To learn more about the policies in each area and the capabilities they control, use the links below:

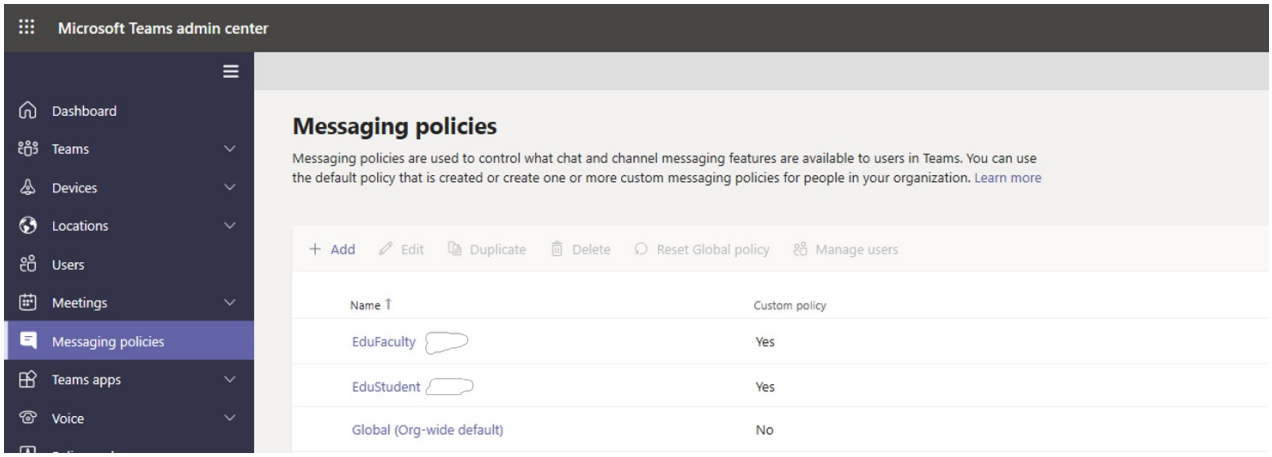
- Meetings
- Live events
- Calling
- Messaging
- Teams
- App permissions



You can manage all Teams policies in the Microsoft Teams admin center by signing in with your admin credentials.

Where to find Microsoft Teams policies

Once you've logged into the Teams admin center, you'll be able to go to the policy settings for any area of Teams you need to manage, by clicking on the policy option in the left hand navigation of the Teams admin center. We've included a screenshot of the location of the messaging policies.



How to create and update a policy definition

Before you assign policies to your users, you need to first add and create your policy definitions for each capability area with Teams.

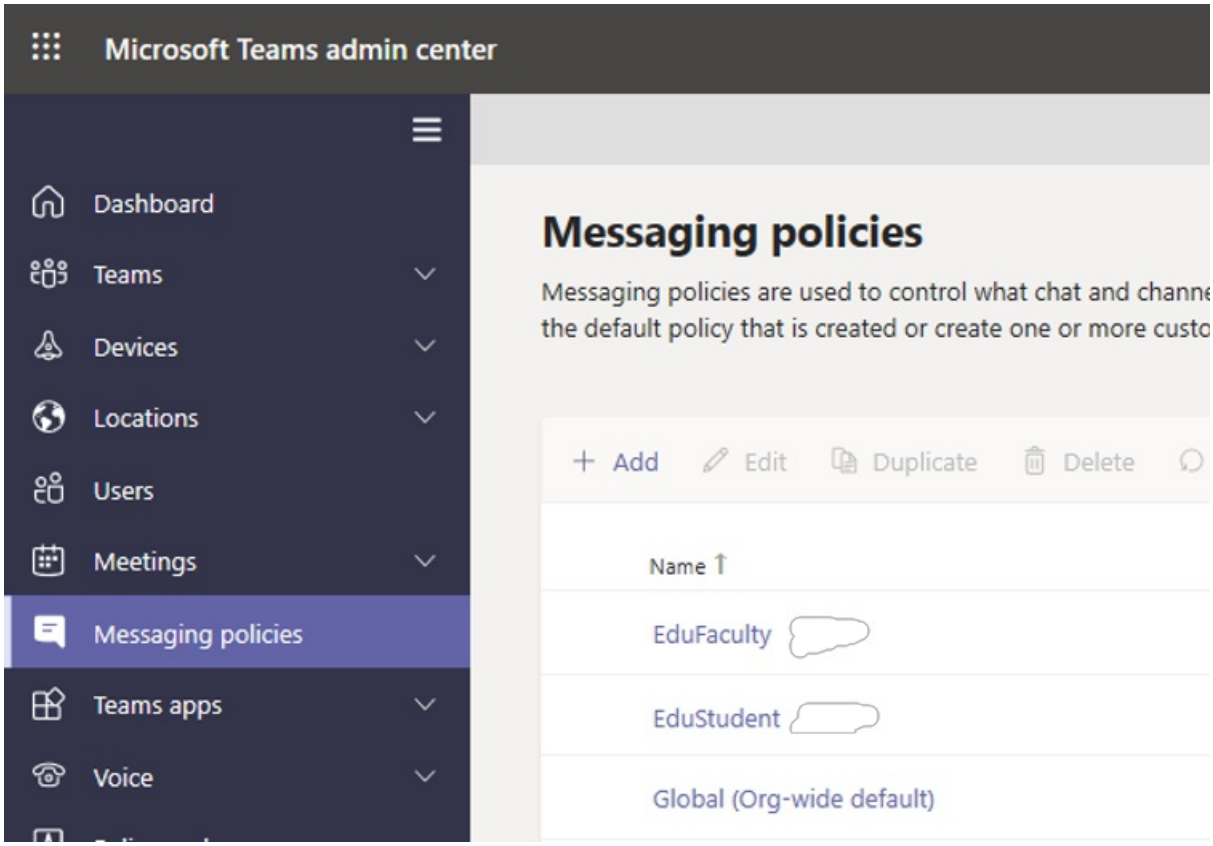
> **NOTE**
>
> We recommend that you set different policy definitions for your students and educators.

By default, every new user (student or educator) will be assigned the Global (Org-wide default) policy definition for each capability area. We recommend that you use the Global (Org-wide default) for your strictest set of policy definitions. In most cases, this stricter policy set will be more appropriate for students. Using your Global (Org-wide default) policy definition in this way will ensure that new users will have the tightest restrictions when they

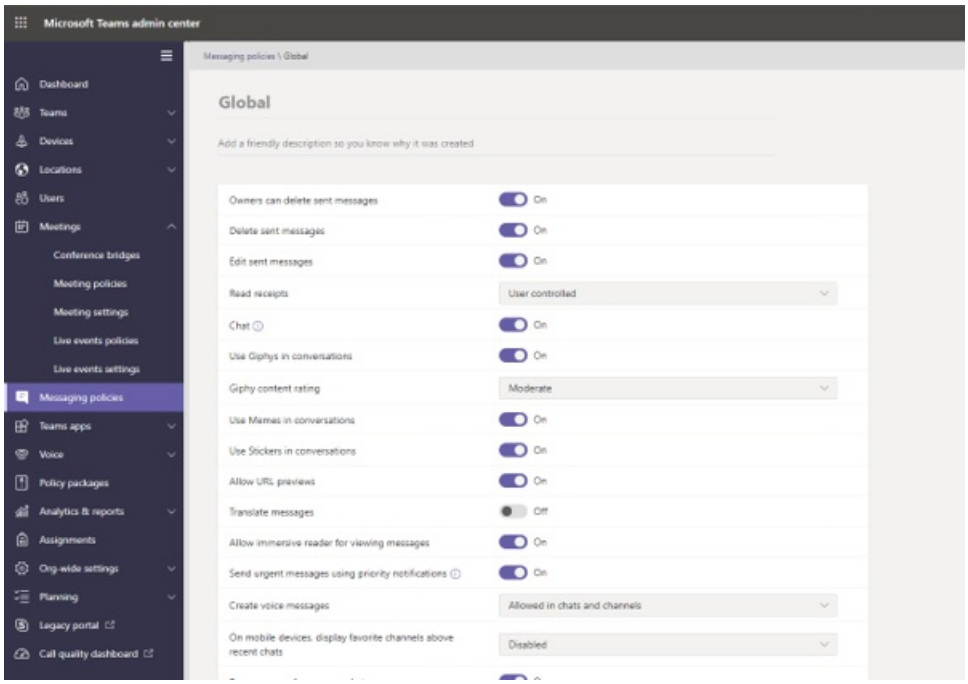
are added to your tenant. To adhere to this guidance, we recommend you follow these steps:

1. Create a custom policy definition for each Teams capability area with policy values that are fitting for your educators' needs (without this, educators will have the same restricted access as your students as defined within the Global (Org-wide default) policy definition).
2. Assign these new custom policy definitions to your educators.
3. Edit the Global (Org-wide default) policy definitions for each capability area with values that are appropriate for your students.
4. The Global (Org-wide default) policy definitions will be applied to your students as long as they have no other policy definitions assigned.

To create or edit policy definitions, go to the policy capability area you want to work in (for example, Messaging policies). Select **Add** to create a new custom policy definition. To change an existing policy definition, select **Edit**.



Whether you choose to add or edit a policy definition, you're brought to a view that lists all the policy options related to this policy area. Use this list to select what values you want set in your policy definition.



> **IMPORTANT**
>
> Don't forget to select **Save** before you leave the page.

Assigning policy definitions

There are multiple methods you can use to assign policy definitions to your users. Each method has its own advantages and disadvantages, which will differ depending on your institution's unique needs.

In most cases, we recommend that you use group policy assignment to assign policies to your users. This method allows for faster and more seamless policy application. When a user is added to a group that has a policy definition assigned to it, the new user automatically inherits the policies of the group. This allows for easier policy management when large numbers of users are added and removed to the environment, for example at the beginning and ending of a school term.

For large organizations, we also recommend batch policy assignment, which is tailored for cases where you need to assign policies to large sets of users. To learn more about these application methods, refer to Assign policies to large sets of users in your school.

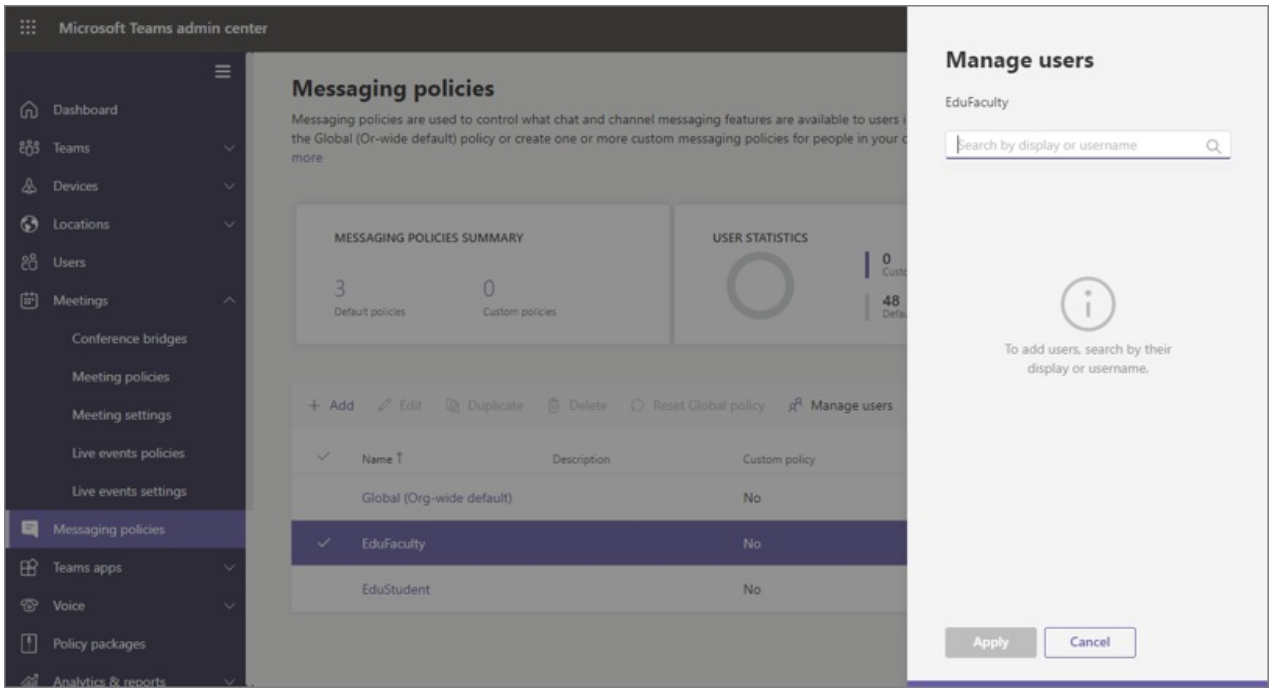
If you have a smaller institution or have a need to update an individual student or educator's policy settings, follow the instructions below.

> **IMPORTANT**
>
> Policy assignments given at the individual user level override any group policies assigned to the user. Ensure that you are only using individual policy assignments when you desire to override group policy settings.

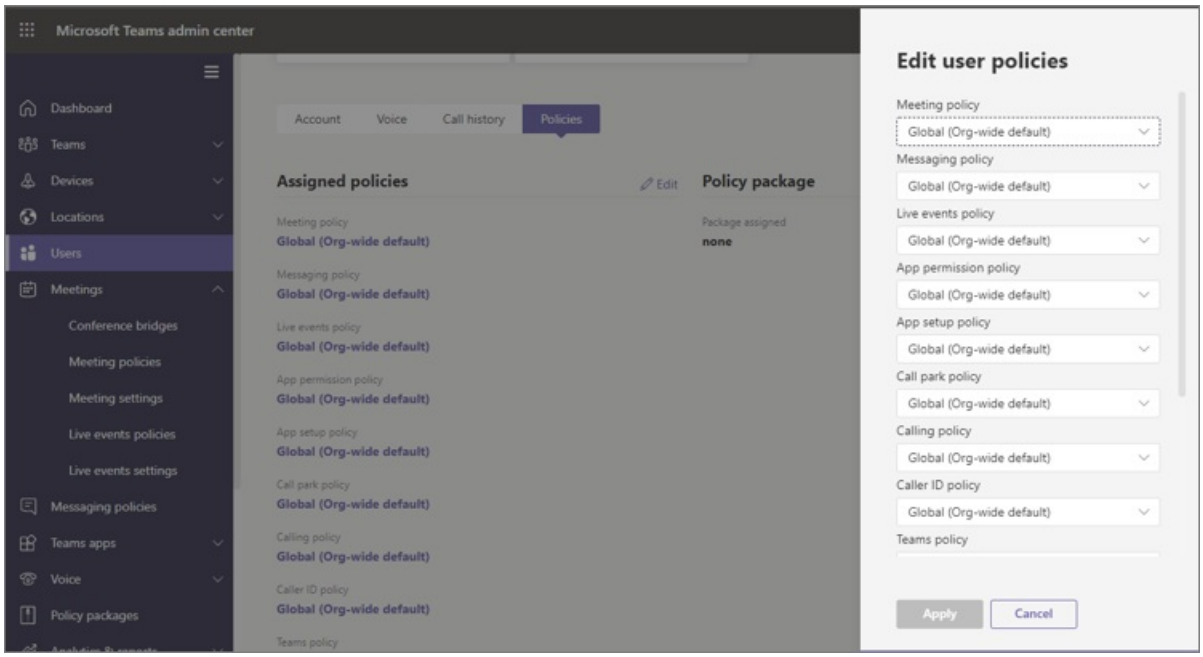
How to assign a policy definition to a user

> **NOTE**
>
> Assigning a policy definition may take a while to propagate out to all the users and clients. You might want to do this when the user accounts are first created in Azure/M365, and whenever a new student joins the educational institute.

Once your policy definition is created or updated, you can assign it to a user by selecting **Manage users** on the policy page, searching for the desired user, then applying the policy.



You can also assign a policy to a user by navigating to **Users**, selecting the user you wish to update policies for, selecting **Policies**, then **Edit**. From there, you can select the policy definition you'd like to assign to the user for each capability area.



Policy packages in Microsoft Teams

> **NOTE**
>
> For more reading, you can check out Manage policy packages in Microsoft Teams for step by step guidance on assigning single users a package, assigning packages in bulk to up to 5000 users, and managing and updating the policies linked to each package.

A policy package in Teams collects predefined policies and policy settings that you learned about outlined above, and assigns them to users with similar roles in your institution. Policy packages simplify, streamline, and help provide consistency when managing policies. In normal practice, you assign each of your users a policy package, and redefine the policies in each package as needed to suit the needs of that user group. When you update settings in a package, all users assigned to that package are changed as a bulk update.

Educational institutions in general have many users with unique needs, depending partly on the age and maturity of the students. For example, you may want to grant educators and staff full access to Microsoft Teams, but want to limit Microsoft Teams capabilities for students to encourage a safe and focused learning environment. You can use policy packages to tailor settings based on the needs of different cohorts in your educational institute community.

> **IMPORTANT**
>
> Our primary recommendation is that you use the Global (Org-wide default) policy definition for students instead of a policy package. This ensures that new users in your organizations always have the strictest set of policies appropriate for students. If this recommendation does not meet the needs of your institution, one of the student policy packages below may be a good alternative.

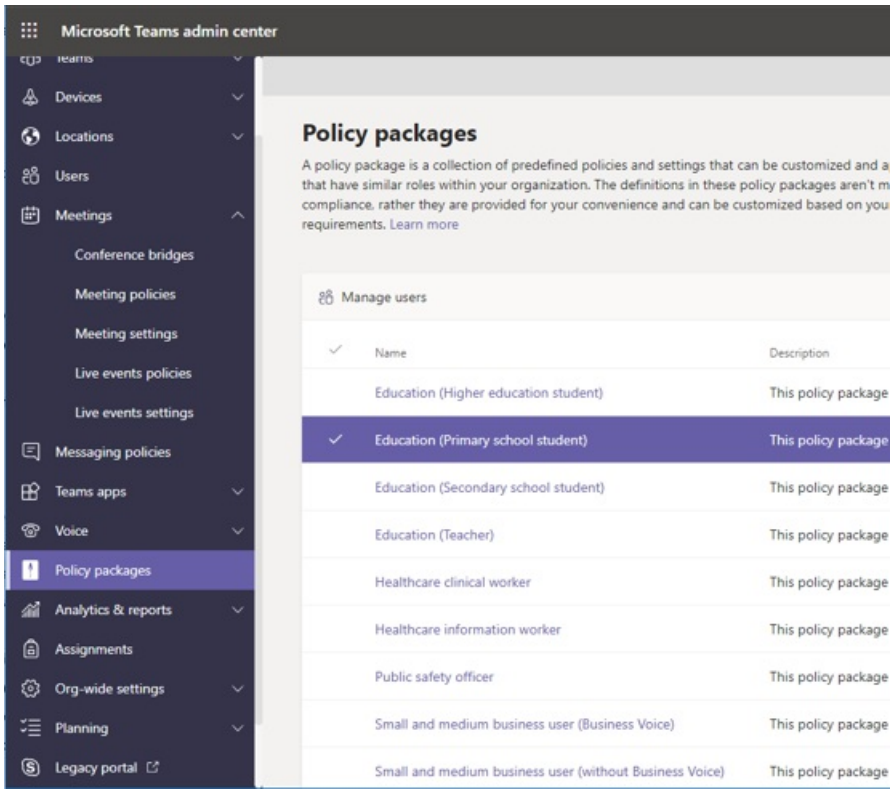
Just like the policy list earlier in this article, policy packages predefine policies for:

- Meetings
- Live events
- Calling
- Messaging
- App permissions

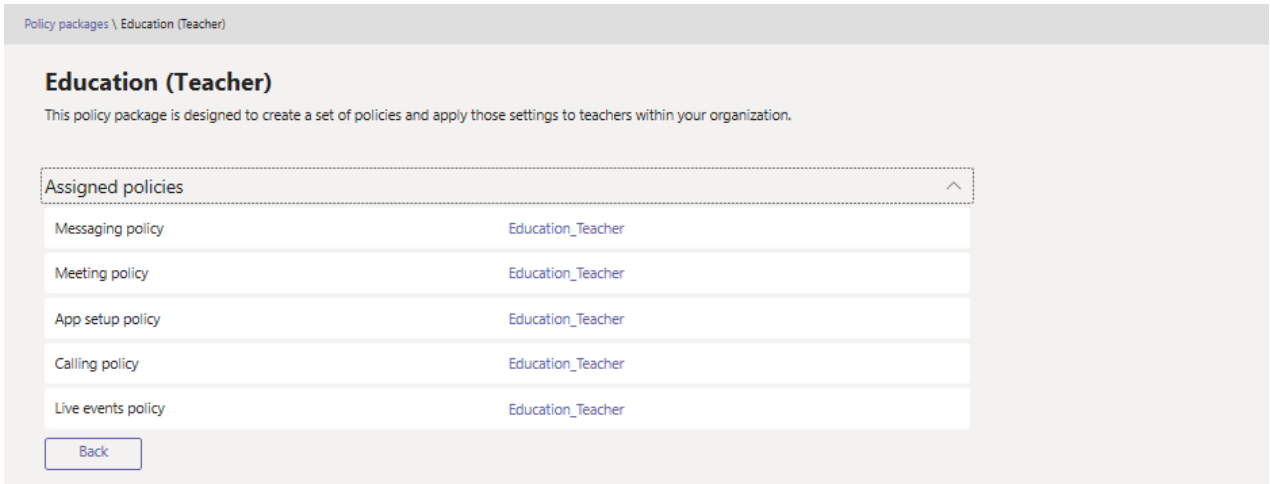
Microsoft Teams currently includes the following policy packages:

PACKAGE NAME LISTED IN MICROSOFT TEAMS ADMIN CENTER	BEST USED FOR	DESCRIPTION
Education_Teacher	Educators and staff	Use this set of policies and policy settings to grant educators and staff within your organization full access to chat, calling and meetings through Microsoft Teams.
Education_PrimaryStudent	Primary school aged students	Younger, primary school aged students within your institution may need more limits within Microsoft Teams. Use this set of policies and policy settings to limit capabilities like meetings creation and management, chat management, and private calling.
Education_SecondaryStudent	Secondary school aged students	Secondary school aged students within your institution may need more limits within Microsoft Teams. Use this set of policies and policy settings to limit capabilities like meetings creation and management, chat management, and private calling.
Education_HigherEducationStudent	Higher education students	Higher education students within your intuition may need fewer limits than younger students, but some limitations may be recommended. You can use this set of policies and policy settings to give access to chat, calling, and meetings within your organization, but limit how your students use Microsoft Teams with external participants.

PACKAGE NAME LISTED IN MICROSOFT TEAMS ADMIN CENTER	BEST USED FOR	DESCRIPTION
Education_PrimaryTeacher_RemoteLearning	Educators and staff	Creates a set of policies that apply to primary teachers to maximize student safety and collaboration when using remote learning.
Education_PrimaryStudent_RemoteLearning	Primary school aged students	Creates a set of policies that apply to primary students to maximize student safety and collaboration when using remote learning.



Each individual policy is given the name of the policy package so you can identify policies linked to a policy package. For example, when you assign the Education_Teacher policy package to educators in your educational institution, a policy named Education_Teacher is created for each policy in the package.



> **NOTE**
>
> If you decide that educators and administrative support staff need different policies, you can repurpose an existing package: identify a package you aren't currently using and change the settings to be appropriate for that group. You might have to make a note to yourself which group has which package, but that's the only impediment to repurposing a package.

Manage policy packages

View

View the settings of each policy in a policy package before you assign a package. In the left navigation of the Microsoft Teams admin center, select **Policy packages**, select the package name, and then select the policy name.

Decide whether the predefined values are appropriate for your organization or whether you need to customize them to be more restrictive or lenient based on your organization's needs.

Customize

Customize the settings of policies in the policy package, as needed, to fit the needs of your organization. Any changes you make to policy settings are automatically applied to users who are assigned the package. To edit the settings of a policy in a policy package, in the Microsoft Teams admin center, select the policy package, select the name of the policy you want to edit, and then select **Edit**.

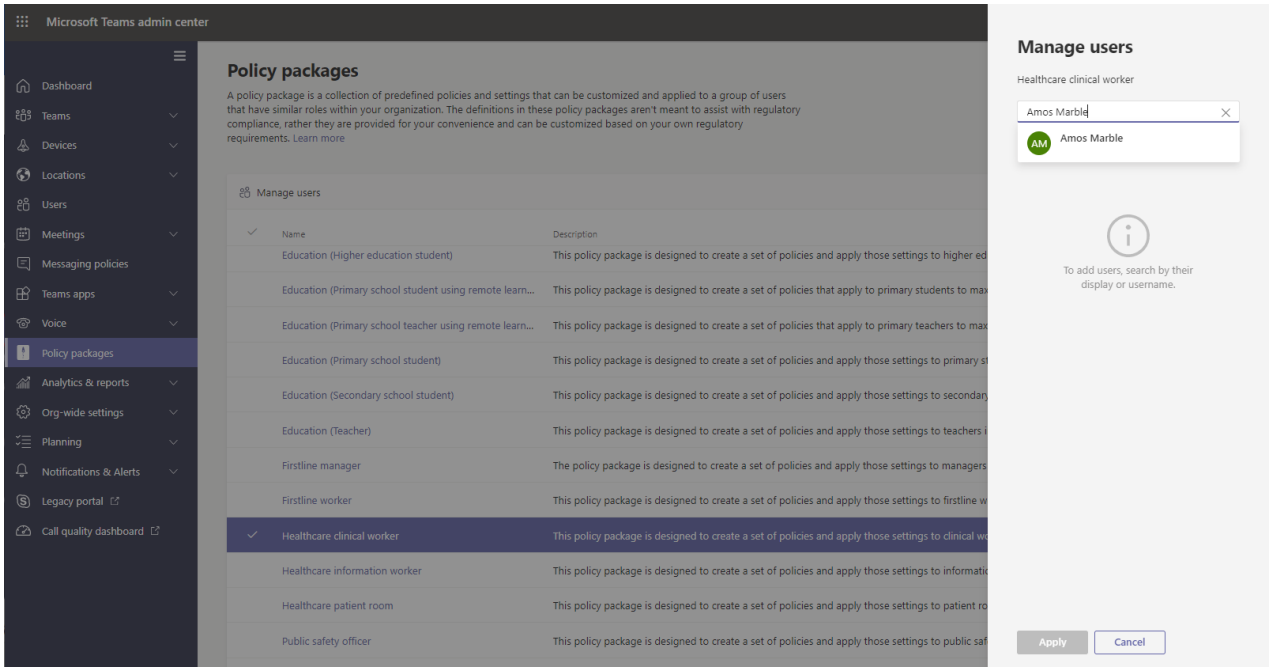
Keep in mind that you can also change the settings of policies in a package after you assign the policy package. To learn more, see Customize policies in a policy package.

Assign

Assign the policy package to users. If a user has a policy assigned, and then later you assign a different policy, the most recent assignment will take priority.

Assign a policy package to one or several users

To assign a policy package to one or multiple users, in the left navigation of the Microsoft Teams admin center, go to **Policy packages**, and then select **Manage users**.



To learn more, see Assign a policy package.

If a user has a policy assigned, and then later you assign a different policy, the most recent assignment will take priority.

Assign a policy package to a group

This feature is in private preview

Policy package assignment to groups let you assign multiple policies to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly. This method is recommended for groups of up to 50,000 users but will also work with larger groups.

To learn more, see Assign a policy package to a group.

Assign a policy package to a large set (batch) of users

Use batch policy package assignment to assign a policy package to large sets of users at a time. You use the New-CsBatchPolicyPackageAssignmentOperation cmdlet to submit a batch of users and the policy package that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch.

A batch can contain up to 5,000 users. You can specify users by their object Id, UPN, SIP address, or email address. To learn more, see Assign a policy package to a batch of users.

Policies that should be assigned for student safety

For more information on the steps you need to take to protect students in your environment, carefully review Keeping students safe while using Teams for distance learning.

Assign policies to large sets of users in your school

12/5/2020 • 11 minutes to read • Edit Online

IMPORTANT

You can run the Teams for Education Policy Wizard to easily apply policies for your students, educators and staff. The tool adjusts the Global (Org-wide default) policy definition of a core set of policies with settings that we recommend for student safety and applies it to students. The tool also creates and assigns a set of custom policies to educators and staff. If you already used the wizard to apply policies for your students, educators and staff, use this article as a reference or *only* if you want to manually create and manage policies for your students, educators and staff.

NOTE

For the larger story on assigning policies in Microsoft Teams, see Assign policies to your users in Teams.

Overview

Do you need to give your students and educators access to different features in Microsoft Teams? You can quickly identify the users in your organization by license type and then assign them the appropriate policy. This tutorial shows you how to assign a meeting policy to large sets of users in your school. You can assign policies using the Microsoft Teams admin center and PowerShell and we'll show you both ways.

You can assign a meeting policy to a security group that the users are members of or directly to users at scale through a batch policy assignment. You'll learn how to:

- **Use policy assignment to groups to assign a meeting policy to a security group (recommended)**. This method lets you assign a policy based on group membership. You can assign a policy to a security group or distribution list. As members are added to or removed from the group, their inherited policy assignments are updated accordingly. We recommend you use this method because it reduces the time to manage policies for new users or when users' roles change. This method works best for groups of up to 50,000 users but will also work with larger groups.
- **Use batch policy assignment to assign a meeting policy directly to users in bulk**. You can assign a policy for up to 5,000 users at a time. If you have more than 5,000 users, you can submit multiple batches. With this method, when you have new users, you'll need to re-run the batch assignment to assign the policy to those new users.

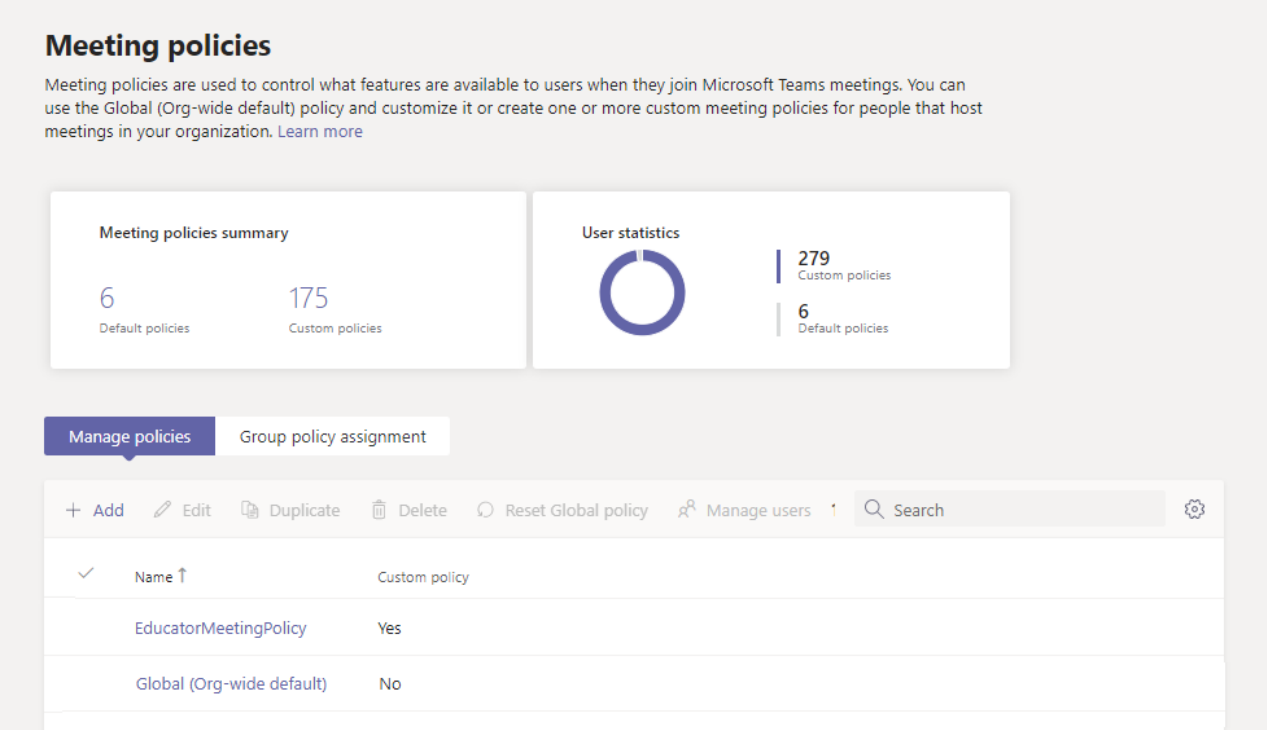
Remember that in Teams, users automatically get the Global (Org-wide default) policy for a Teams policy type unless you create and assign a custom policy. Because the student population is often the largest set of users and they often receive the most restrictive settings, we recommend that you do the following:

- Create a custom policy that allows core capabilities such as private chat and meeting scheduling and assign the policy to your staff and educators.
- Assign the custom policy to your staff and educators.
- Edit and apply the Global (Org-wide default) policy to restrict capabilities for students.

Keep in mind that the Global policy will apply to all users in your school until you create a custom policy and assign it to your staff and educators.

In this tutorial, students will get the Global meeting policy and we'll assign a custom meeting policy named

EducatorMeetingPolicy to staff and educators. We assume that you've edited the Global policy to tailor meeting settings for students and created a custom policy that defines the meeting experience for staff and educators.



Assign a policy to a group

Follow these steps to create a security group for your staff and educators, and then assign a custom meeting policy named EducatorMeetingPolicy to that security group.

Before you get started

> **IMPORTANT**
>
> When you assign a policy to a group, the policy assignment is propagated to members of the group according to precedence rules. For example, if a user is directly assigned a policy (either individually or through a batch assignment), that policy takes precedence over a policy that's inherited from a group. This also means that if a user has a meeting policy that was directly assigned to them, you'll have to remove that meeting policy from the user before they can inherit a meeting policy from a security group.

Before you get started, it's important to understand precedence rules and group assignment ranking. **Make sure that you read and understand the concepts in What you need to know about policy assignment to groups.**

You'll need to complete all these steps for your staff and educators to inherit a meeting policy from a security group.

1. Create security groups.
2. Assign a policy to a security group.
3. Remove a policy that was directly assigned to users.

Create security groups

First, create a security group for your staff and educators.

With School Data Sync (SDS), you can easily create security groups educators and students in your school. We recommend that you use SDS to create the security groups you need to manage policies for your school.

If you're unable to deploy SDS within your environment, use this PowerShell script to create two security groups,

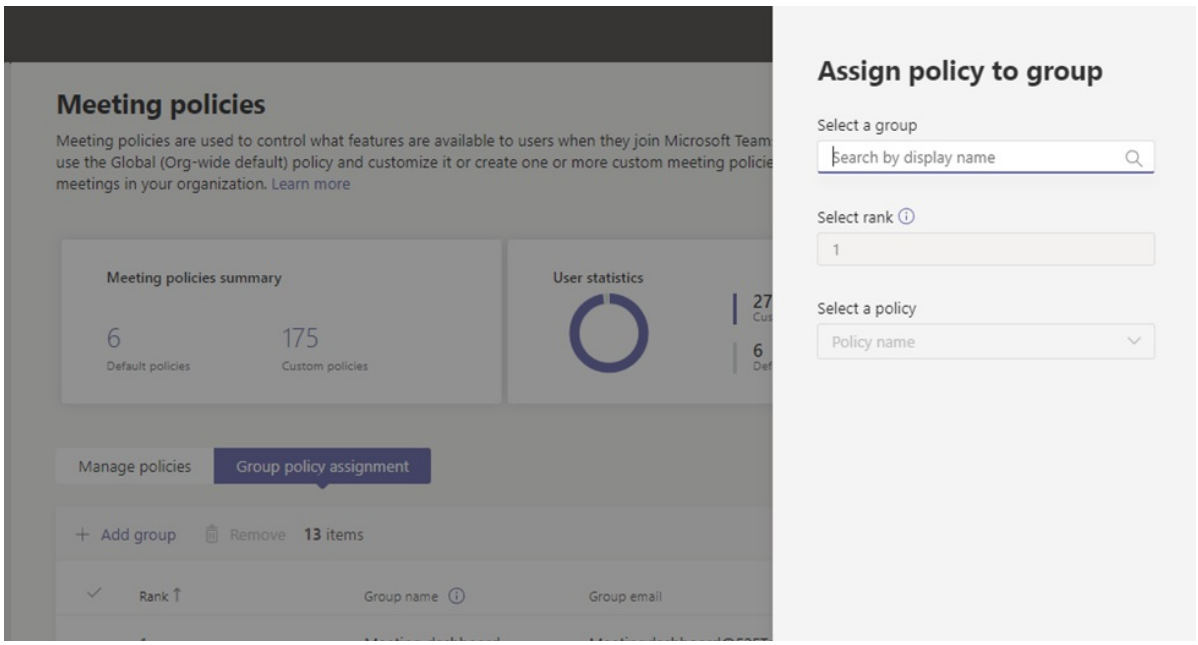
one for all staff and educators who have a Faculty license assigned and another for all students who have a Student license assigned. You'll need to run this script routinely to keep the groups fresh and up to date.

Assign a policy to a security group

Using the Microsoft Teams admin center

> **NOTE**
>
> Currently, policy assignment to groups using the Microsoft Teams admin center is only available for Teams calling policy, Teams call park policy, Teams policy, Teams live events policy, Teams meeting policy, and Teams messaging policy. For other policy types, use PowerShell.

1. In the left navigation of the Microsoft Teams admin center, go to **Meetings** > **Meeting policies**.
2. Select the **Group policy assignment** tab.
3. Select **Add group**, and then in the **Assign policy to group** pane, do the following:



   a. In the **Select a group** box, search for and add the security group that contains your staff and educators.
   b. In the **Select rank** box, enter **1**.
   c. In the **Select a policy** box, select **EducatorMeetingPolicy**.
   d. Select **Apply**.

To remove a group policy assignment, on the **Group policy assignment** tab of the policy page, select the group assignment, and then select **Remove**.

To change the ranking of a group assignment, you have to first remove the group policy assignment. Then, follow the steps above to assign the policy to a group.

Using PowerShell

> **NOTE**
>
> Currently, policy assignment to groups using PowerShell isn't available for all Teams policy types. See New-CsGroupPolicyAssignment for the list of supported policy types.

Install and connect to the Microsoft Teams PowerShell module

Run the following to install the Teams PowerShell module (if it's not already installed). Make sure you install version 1.0.5 or later.

```
Install-Module -Name MicrosoftTeams
```

Run the following to connect to Teams and start a session.

```
Connect-MicrosoftTeams
```

When you're prompted, sign in using your admin credentials.

Assign a policy to a group

Run the following to assign the meeting policy named EducatorMeetingPolicy to the security group that contains your staff and educators and set the assignment ranking to 1. You can specify a security group by using the object Id, Session Initiation Protocol (SIP) address, or email address. In this example, we use an email address (staff-faculty@contoso.com).

```
New-CsGroupPolicyAssignment -GroupId staff-faculty@contoso.com -PolicyType TeamsMeetingPolicy -PolicyName
"EducatorMeetingPolicy" -Rank 1
```

Remove a policy that was directly assigned to users

Remember that if a user was directly assigned a policy (either individually or through a batch assignment), that policy takes precedence. This means that if a user has a meeting policy that was directly assigned to them, you'll have to remove that meeting policy from the user before they can inherit a meeting policy from a security group.

To learn more, see What you need to know about policy assignment to groups.

Follow these steps to remove the meeting policy that was directly assigned to your staff and educators.

Install and connect to the Microsoft Teams PowerShell module

Run the following to install the Teams PowerShell module (if it's not already installed). Make sure you install version 1.0.5 or later.

```
Install-Module -Name MicrosoftTeams
```

Run the following to connect to Teams and start a session.

```
Connect-MicrosoftTeams
```

When you're prompted, sign in using the same admin credentials you used to connect to Azure AD.

Unassign a policy that was directly assigned to users

Run the following to remove a meeting policy from users who were directly assigned that policy. You can specify users by email address or object ID.

In this example, the meeting policy is removed from users specified by their email address.

```
$users_ids = @("reda@contoso.com", "nikica@contoso.com", "jamie@contoso.com")
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsMeetingPolicy -PolicyName $null -Identity $users_ids -
OperationName "Unassign meeting policy"
```

In this example, the meeting policy is removed from the list of users in a text file named user_ids.txt.

```
$user_ids = Get-Content .\users_ids.txt
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsMeetingPolicy -PolicyName $null -Identity $users_ids -
OperationName "Unassign meeting policy"
```

Get policy assignments for a group

Run the following to see all the policies assigned to a specific security group. Note that groups are always listed by their group Id even if its SIP address or email address was used to assign the policy.

```
Get-CsGroupPolicyAssignment -GroupId staff-faculty@contoso.com
```

Get the policies assigned to a user

Run the following to see all the policies that are assigned to a specific user. The following example shows you how to get the policies that are assigned to reda@contoso.com.

```
Get-CsUserPolicyAssignment -Identity reda@contoso.com
```

Assign a policy to a batch of users

Follow these steps to assign a custom meeting policy named EducatorMeetingPolicy directly to your staff and educators in bulk.

Using PowerShell

Connect to the Azure AD PowerShell for Graph module and the Teams PowerShell module

Before you perform the steps in this article, you'll need to install and connect to the Azure AD PowerShell for Graph module (to identify users by their assigned licenses) and the Microsoft Teams PowerShell module (to assign the policies to those users).

Install and connect to the Azure AD PowerShell for Graph module

Open an elevated Windows PowerShell command prompt (run Windows PowerShell as an administrator), and then run the following to install the Azure Active Directory PowerShell for Graph module.

```
Install-Module -Name AzureAD
```

Run the following to connect to Azure AD.

```
Connect-AzureAD
```

When you're prompted, sign in using your admin credentials.

To learn more, see Connect with the Azure Active Directory PowerShell for Graph module.

Install and connect to the Microsoft Teams PowerShell module

Run the following to install the Teams PowerShell module (if it's not already installed). Make sure you install version 1.0.5 or later.

```
Install-Module -Name MicrosoftTeams
```

Run the following to connect to Teams and start a session.

```
Connect-MicrosoftTeams
```

When you're prompted, sign in using the same admin credentials you used to connect to Azure AD.

Identify your users

First, run the following to identify your staff and educators by license type. This tells you what SKUs are in use in your organization. You can then identify staff and educators that have a Faculty SKU assigned.

```
Get-AzureAdSubscribedSku | Select-Object -Property SkuPartNumber,SkuId
```

Which returns:

```
SkuPartNumber      SkuId
-------------      -----
M365EDU_A5_FACULTY e97c048c-37a4-45fb-ab50-922fbf07a370
M365EDU_A5_STUDENT 46c119d4-0379-4a9d-85e4-97c66d3f909e
```

In this example, the output shows that the Faculty license SkuId is "e97c048c-37a4-45fb-ab50-922fbf07a370".

> **NOTE**
>
> To see a list of Education SKUs and SKU IDs, see Education SKU reference.

Next, we run the following to identify the users that have this license and collect them all together.

```
$faculty = Get-AzureADUser -All $true | Where-Object {($_.assignedLicenses).SkuId -contains "e97c048c-37a4-
45fb-ab50-922fbf07a370"}
```

Assign a policy in bulk

Now, we assign the appropriate policies to users in bulk. The maximum number of users for which you can assign or update policies is 5,000 at a time. For example, if you have more than 5,000 staff and educators, you'll need to submit multiple batches.

Run the following to assign a custom meeting policy named EducatorMeetingPolicy to your staff and educators.

```
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsMeetingPolicy -PolicyName EducatorMeetingPolicy -
Identity $faculty.ObjectId
```

> **NOTE**
>
> To assign a different policy type in bulk, like TeamsMessagingPolicy, you'll need to change `PolicyType` to the policy that you're assigning and `PolicyName` to the policy name.

Get the status of a bulk assignment

Each bulk assignment returns an operation ID, which you can use to track the progress of the policy assignments or identify any failures that might occur. For example, run the following:

```
Get-CsBatchPolicyAssignmentOperation -OperationId 3964004e-caa8-4eb4-b0d2-7dd2c8173c8c | fl
```

To view the assignment status of each user in the batch operation, run the following. Details of each user are in the `UserState` property.

```
Get-CsBatchPolicyAssignmentOperation -OperationId 3964004e-caa8-4eb4-b0d2-7dd2c8173c8c | Select -
ExpandProperty UserState
```

Assign a policy in bulk if you have more than 5,000 users

First, run the following to see how many staff and educators you have:

```
$faculty.count
```

Instead of providing the whole list of user IDs, run the following to specify the first 5,000, and then the next 5,000, and so on.

```
New-CsBatchPolicyAssignmentOperation -PolicyType TeamsMeetingPolicy -PolicyName EducatorMeetingPolicy -
Identity $faculty[0..19999].ObjectId
```

You can change the range of user IDs until you reach the full list of users. For example, enter `$faculty[0..4999` for the first batch, use `$faculty[5000..9999` for the second batch, enter `$faculty[10000..14999` for the third batch, and so on.

Get the policies assigned to a user

Run the following to see all the policies that are assigned to a specific user. The following example shows you how to get the policies that are assigned to hannah@contoso.com.

```
Get-CsUserPolicyAssignment -Identity hannah@contoso.com
```

FAQ

I'm not familiar with PowerShell for Teams. Where can I learn more?

For an overview of using PowerShell to manage Teams, see Teams PowerShell overview. For more information about the cmdlets used in this article, see:

- New-CsGroupPolicyAssignment
- Get-CsGroupPolicyAssignment
- New-CsBatchPolicyAssignmentOperation
- Get-CsBatchPolicyAssignmentOperation
- Get-CsUserPolicyAssignment

Related topics

- Assign policies to your users
- Teams policies and policy packages for Education
- Manage meeting policies in Teams

PowerShell script sample - Create security groups for educators and students in your school

7/31/2020 • 6 minutes to read • Edit Online

Use this PowerShell script to create the security groups that you need to manage Microsoft Teams policies in your school. The policy assignment to groups feature in Teams lets you assign a policy to a group of users, such as a security group. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly.

This PowerShell script creates two security groups, one for staff and educators and another for students in your school, based on license type. You can then assign policies to the security groups that you created. For more information about using this script, see Assign policies to large sets of users in your school.

This script does the following:

- Identifies staff and educators who are assigned a Faculty SKU, creates a security group, and then adds staff and educators to the group.
- Identifies students who are assigned a Student SKU, creates a security group, and then adds the students to the group.
- Updates the membership of each security group to add or remove staff, educators, and students based on whether they have a license.

You'll need to run this script regularly to keep the security groups fresh and up to date.

> **IMPORTANT**
> It's important to understand precedence rules and group assignment ranking when assigning policies to groups. Make sure that you read and understand the concepts in What you need to know about policy assignment to groups.

Before you start

Download and install the Skype for Business Online PowerShell module, and then restart your computer if prompted.

To lean more, see Manage Skype for Business Online with Office 365 PowerShell and Teams PowerShell overview.

Sample script

```
<#
Script Name:
CreateOrUpdate_SecurityGroup_Per_LicenseType.ps1
Synopsis:
This script is designed to perform following operations:
1. Create a security group for faculty and student members based on the assigned license SKU and add the
members accordingly.
2. Update the security group to add/remove teachers and students so that only users who have a valid
teacher/student license are present in the group.
The output of the script is written in a log file present at location: C:\results\log.txt
Written By:
Mihir Roy
Change Log:
Version 1.0, 10/08/2019 - First Draft
#>
```

```
#>

#Figure out to determine if the user is using an existing group or creating a new one
param
(
    [string]$teachergroupname,
 [string]$teachergroupdesc,
 [string]$studentgroupname,
 [string]$studentgroupdesc,
 [Guid]$facultyid,
 [Guid]$studentid
)

[bool] $create = $false

if ([string]::IsNullOrEmpty($teachergroupname) -and [string]::IsNullOrEmpty($studentgroupname) -and
[string]::IsNullOrEmpty($studentid) -and [string]::IsNullOrEmpty($facultyid)) {
 throw "Please enter valid groupnames to create groups for Teachers and Students. In order to update a group,
please enter the teacher and/or student group id's."
}

#Connect to Azure AD
Write-Host "`n"
Write-Host -ForegroundColor Green "Please enter your Global Administrator Username and Password"
Write-Host "`n"
Connect-MsolService

[Guid] $teachergroupid = New-Guid
[Guid] $studentgroupid = New-Guid

if (![string]::IsNullOrEmpty($teachergroupname)) {
 New-MsolGroup -DisplayName $teachergroupname -Description $teachergroupdesc
 $Group = Get-MsolGroup -SearchString $teachergroupname
 $teachergroupid = $Group.ObjectId
 $create = $true
}

if (![string]::IsNullOrEmpty($studentgroupname)) {
 New-MsolGroup -DisplayName $studentgroupname -Description $studentgroupdesc
 $Group = Get-MsolGroup -SearchString $studentgroupname
 $studentgroupid = $Group.ObjectId
 $create = $true
}


#Build the Students Array
$StudentsArray = @()

#Build the Teachers Array
$TeachersArray = @()

#Build the Student Sku Array
$StudentSkus = @()
$AllSkus = Get-AzureADSubscribedSku
$StudentSkuIDs = ($AllSkus | ? {$_.skupartnumber -like "*student*"}).skuid
Write-Host -ForegroundColor Green "The Student Skus identified are listed below:"
Foreach ($Element in $StudentSkuIDs) {
$SkuPart = (Get-AzureADSubscribedSku | ? {$_.SkuID -eq $Element}).SkuPartNumber
Write-Host -ForegroundColor Green "Student SkuID ${Element} for License $SkuPart"
}
Write-Host "`n"

#Build the Teacher Sku Array
$TeacherSkus = @()
$AllSkus = Get-AzureADSubscribedSku
$TeacherSkuIDs = ($AllSkus | ? {$_.skupartnumber -like "*faculty*"}).skuid
Write-Host -ForegroundColor Green "The Teacher Skus identified are listed below:"
Foreach ($Element in $TeacherSkuIDs) {
$SkuPart = (Get-AzureADSubscribedSku | ? {$_.SkuID -eq $Element}).SkuPartNumber
Write-Host -ForegroundColor Green "Teacher SkuID ${Element} for License $SkuPart"
```

```
Write-Host -ForegroundColor Green "Teacher SkuID ${Element} for License $SkuPart"
}
Write-Host "`n"

#Get All Users in AAD
Write-Host -ForegroundColor Green "Getting All Users in Azure Active Directory with an assigned license"
Write-Host "`n"
$AllUsers = Get-AzureADUser -All $true | ? {$_.AssignedLicenses -ne $null}

$teacherAdd = $create -and ($teachergroupid -ne $null)
$studentAdd = $create -and ($studentgroupid -ne $null)

#Start foreach loop for all users with student licenses
if ($teacherAdd -or $studentAdd) {
 Foreach ($User in $AllUsers) {
 $ObjectID = $User.ObjectID
 Write-host "`n"
 Write-Host -ForegroundColor Green "Getting Assigned Licenses for $DN"
 $GetUser = Get-AzureADUser -objectid $user.objectid
 $AssignedLicenses = ($GetUser | select -ExpandProperty assignedlicenses).skuid
 Write-Host -ForegroundColor Green "User Assigned License: " $User.Displayname "-" $AssignedLicenses "-"
$User.ObjectId


 #Set Variables
 $UPN = $User.userprincipalname
 $DN = $User.Displayname
 $OBJ = $User.ObjectID
 $Age = $User.AgeGroup
 $Consent = $User.ConsentProvidedForMinor
 $Legal = $User.LegalAgeGroupClassification

  #Start foreach loop for all assigned skus
  Foreach ($License in $AssignedLicenses) {

   #Creating new PS Object for each Sku and adding to the array
   If ($TeacherSkuIDs -contains $License) {
    $TeacherObj = New-Object PSObject
    $TeacherObj | Add-Member NoteProperty -Name UserPrincipalName -Value $UPN
    $TeacherObj | Add-Member NoteProperty -Name DisplayName -Value $DN
    $TeacherObj | Add-Member NoteProperty -Name ObjectID -Value $OBJ
    $TeacherObj | Add-Member NoteProperty -Name SkuID -Value $License
    $TeacherObj | Add-Member NoteProperty -Name AgeGroup -Value $Age
    $TeacherObj | Add-Member NoteProperty -Name ConsentProvidedForMinor -Value $Consent
    $TeacherObj | Add-Member NoteProperty -Name LegalAgeGroupClassification -Value $Legal
    $TeachersArray += $TeacherObj
    if ($teachergroupid -ne $null) {
     Add-MsolGroupMember -GroupObjectId $teachergroupid -GroupMemberType User -GroupMemberObjectId $OBJ
    }
   }

   If ($StudentSkuIDs -contains $License) {
    $StudentObj = New-Object PSObject
    $StudentObj | Add-Member NoteProperty -Name UserPrincipalName -Value $UPN
    $StudentObj | Add-Member NoteProperty -Name DisplayName -Value $DN
    $StudentObj | Add-Member NoteProperty -Name ObjectID -Value $OBJ
    $StudentObj | Add-Member NoteProperty -Name SkuID -Value $License
    $StudentObj | Add-Member NoteProperty -Name AgeGroup -Value $Age
    $StudentObj | Add-Member NoteProperty -Name ConsentProvidedForMinor -Value $Consent
    $StudentObj | Add-Member NoteProperty -Name LegalAgeGroupClassification -Value $Legal
    $StudentsArray += $StudentObj
    if ($studentgroupid -ne $null) {
     Add-MsolGroupMember -GroupObjectId $studentgroupid -GroupMemberType User -GroupMemberObjectId $OBJ
    }
   }
  }
 }
}
```

```
if ((!$teacherAdd) -and ($facultyid -ne $null)) {
 #Users to be Added in the Teacher Group that are not present
 $teacherGrpMembers = Get-MsolGroupMember -GroupObjectId $facultyid
 $teachersToAdd = ($AllUsers | ? {$_.ObjectId -ne $null}).objectid | Where {($teacherGrpMembers | ?
{$_.ObjectId -ne $null}).objectid -NotContains $_}
 Foreach ($id in $teachersToAdd) {
  $GetUser = Get-AzureADUser -objectid $id
  $AssignedLicenses = ($GetUser | select -ExpandProperty assignedlicenses).skuid
  Foreach ($License in $AssignedLicenses) {

   #Adding faculty members to the security group
   If ($TeacherSkuIDs -contains $License) {
    Add-MsolGroupMember -GroupObjectId $facultyid -GroupMemberType User -GroupMemberObjectId $id
   }
  }
 }

 #Users (Faculty) to be removed from the group that are not in tenant anymore
 $teachersToRemove = ($teacherGrpMembers | ? {$_.ObjectId -ne $null}).objectid | Where {($AllUsers | ?
{$_.ObjectId -ne $null}).objectid -NotContains $_}
 if ($teachersToRemove.Count > 0) {
  Foreach ($id in $teachersToRemove) {
   Remove-MsoLGroupMember -GroupObjectId $facultyid -GroupMemberType User -GroupmemberObjectId $id
  }
 }
}

if ((!$studentAdd) -and ($studentid -ne $null)) {
 #Users to be Added in the Student Group that are not present
 $studentGrpMembers = Get-MsolGroupMember -GroupObjectId $studentid
 $studentsToAdd = ($AllUsers | ? {$_.ObjectId -ne $null}).objectid | Where {($studentGrpMembers | ?
{$_.ObjectId -ne $null}).objectid -NotContains $_}
 Foreach ($id in $studentsToAdd) {
  $GetUser = Get-AzureADUser -objectid $id
  $AssignedLicenses = ($GetUser | select -ExpandProperty assignedlicenses).skuid
  Foreach ($License in $AssignedLicenses) {

   #Adding student members to the security group
   If ($StudentSkuIDs -contains $License) {
    Add-MsolGroupMember -GroupObjectId $studentid -GroupMemberType User -GroupMemberObjectId $id
   }
  }
 }

 #Users (Students) to be removed the group that are not in tenant anymore
 $studentsToRemove = ($studentGrpMembers | ? {$_.ObjectId -ne $null}).objectid | Where {($AllUsers | ?
{$_.ObjectId -ne $null}).objectid -NotContains $_}
 if ($studentsToRemove.Count > 0) {
  Foreach ($id in $studentsToRemove) {
   Remove-MsolGroupMember -GroupObjectId $studentid -GroupMemberType User -GroupmemberObjectId $id
  }
 }
}

Start-Transcript -Path "C:\results\log.txt"
if ($facultyid -ne $null) {
 $TeacherGroup = Get-MsolGroupMember -GroupObjectId $facultyid
 Write-Host -ForegroundColor Green "Teacher Group Count:" $TeacherGroup.Count
 Write-Host -ForegroundColor Green "Teacher Group Id:" $facultyid
}
else {
 $TeacherGroup = Get-MsolGroupMember -GroupObjectId $teachergroupid
 Write-Host -ForegroundColor Green "Teacher Group Count:" $TeacherGroup.Count
 Write-Host -ForegroundColor Green "Teacher Group Id:" $teachergroupid
}

if ($studentid -ne $null) {
 $StudentGroup = Get-MsolGroupMember -GroupObjectId $studentid
 Write-Host -ForegroundColor Green "Student Group Count:" $StudentGroup.Count
```

```
 Write-Host -ForegroundColor Green "Student Group Id:" $studentid
}
else {
 $StudentGroup = Get-MsolGroupMember -GroupObjectId $studentgroupid
 Write-Host -ForegroundColor Green "Student Group Count:" $StudentGroup.Count
 Write-Host -ForegroundColor Green "Student Group Id:" $studentgroupid
}
Stop-Transcript
```

Related topics

Assign policies to your users in Teams

Help for low bandwidth situations for Teams for EDU

3/28/2020 • 4 minutes to read • Edit Online

There are a lot of network elements when it comes to working with Microsoft Teams that can affect performance, and low bandwidth is one of the situations that can feel entirely out of your control. Consider the following:

- A low-speed internet connection for the school.
- A low-speed internet connection for one or more students.
- Times of the day when there is low bandwidth due to network usage in an area.
- Low bandwidth periods due to outages local to neither the school nor to students, but which impact performance nonetheless.
- Non-bandwidth issues (for example, issues with hardware) that masquerade as low bandwidth issues.

This article will give you best practices to follow for a variety of Teams activities when you're faced with a low-bandwidth issue.

> **IMPORTANT**
>
> There's information here on How Microsoft Teams uses memory, because in addition to low bandwidth problems, you may be having resource issues on your device. If you're looking for network guidance for Microsoft Teams, review Prepare your organization's network for Microsoft Teams.

Resolving low bandwidth issues for ITAdmins

The important thing to remember, as an ITAdmin, is that while you have solutions for low bandwidth issues that are wide-spread that will resolve problems quickly, this should be considered carefully, as some issues may be able to resolved with a more narrow focus taken at the educator or even the student/parent level.

In short, if the low bandwidth issue occurs for a wide group of students, taking action as an ITAdmin makes sense, and it also makes sense if the actions taken at the student/educator level haven't been helpful.

> **NOTE**
>
> If you've got the time to invest, the Quality of Experience Review Guide is a worthwhile read (this is not EDU-specific, but it will still have valuable information). This will allow experienced ITAdmins to go in-depth on the experience for their educators and students.

Meetings and video

A primary focus for low bandwidth issues are meetings, and specifically video in meetings. We have some of the actions below that an ITAdmin should consider when dealing with issues reported by students or educators in regard to having the best meeting experience in an educational setting.

Meeting policies

In regards to meetings, one of the most concerning areas for low bandwidth situations has to do with videos. Fortunately, in addition to Teams being able to scale to detected bandwidth automatically, you as an ITAdmin have policy options you can set at the per-organizer and/or per-user level to give everyone the best experience in light of the bandwidth they have to work with at a given time.

Some of the things you can set via policy include:

- Disabling video altogether, so no one could enable it.
- Media bit rate (this is set per-user).

To learn more about your options, and to walk through the specifics of what policies you'd need to set for meetings and video, check out Meeting policy settings in Teams: Audio and video for detailed walk-through information.

Screen sharing policies

In other cases, educators may be sharing their entire screen to students, when sharing should be limited to an application relevant to the lesson being taught. This can also be set via policy, if that's a more desirable way to do it than to have educators making that choice individually.

For a good idea of what you can do about limiting screen sharing via policy settings, check out Meeting policy settings in Teams: Screen sharing.

Dial-in number for meetings

It may be easier for some students to attempt to dial in to some classroom sessions. You can provide a dial-in number for Teams meetings, so students with issues can phone in as an alternative to attending a video meeting.

For more information on this, you can read Set the phone numbers included on invites in Microsoft Teams.

Low bandwidth scenarios as an educator

Educators should feel empowered to take steps to resolve low bandwidth issues, and may be a superior choice to ITAdmin action in the following situations:

- If the problem is intermittent, or relatively transitory.
- If there is a specific time of the day you can anticipate there being an issue, or the low bandwidth period has some predictability to it.

In these situations, you can take some actions.

For more information, check out Use Teams for schoolwork when bandwidth is low.

Low bandwidth scenarios as a parent or student

There are also situations, and you should proactively discuss them with your educators, where the bandwidth problem may be on the student's side (for example, a large number of students are able to watch the video lessons without issue, but a small number of students have difficulties).

It's not reasonable to expect many parents to be able to troubleshoot these issues, and low bandwidth issues may be out of a student or parent's control (their home may not have access to high bandwidth, they may have a lot of people in their immediate area consuming bandwidth and affecting what they can do, there may be internet instability, and so on).

We've put together guidance in our Use Teams for schoolwork when bandwidth is low article for parents and students as well, you can review and try these recommendations if you're having any problems.

IT Admin Guide to Insights in Teams for Education

11/2/2020 • 5 minutes to read • Edit Online

With Insights in Microsoft Teams for Education, educators and leaders can access analytics data about digital engagement, assignment workload, grades, communication and more. Insights is driven by ethical principles that put educators and students first, meet privacy standards, and ensure continuous compliance for your institution.

Insights is active in Office 365 Education SKUs A1, A3, and A5.

> **NOTE**
> Educators, learn how to use Insights here: Educator's guide to Insights in Microsoft Teams.

Use Insights

User types

- **Students** are identified by their license and *do not have* access to the Insights tab(even if they are an owner of the team).
- **Educators** are identified by faculty licenses. Educators must have a faculty license and be a class team owner to add and see the data presented in the Insights tab.
- **Leaders** are also identified by faculty license, but in addition they need explicit permissions from the IT global admin to view the reports in the Insights app.
- Guest accounts *do not have* access to Insights.

Entry points

Educators and leaders have different entry points where they can discover and use Insights.

Educators can use these two entry points:

- Tabs - insights for each class they own are available in a tab added from the top navigation menu. Insights will surface activity data from all channels within a class team, but can only be added as a tab to public channels. The tab reflects activity from everyone in the class team who isn't an owner (including educators who aren't owners of the team).
- Personal app - an overview of all their active classes is available from the left Teams app bar.

Leaders can use Insights as a personal app.

Manage setup policy

As an admin, you can use app setup policy to install Insights by default for your educators and leaders when they start Teams. With that policy you can customize Teams to highlight Insights, and pin it for them in the apps bar.

> **TIP**
> Read Teams Policies and Policy Packages for Education about Teams policies and policy packages for education.

Compliance

Insights has industry-leading compliance commitments, and is classified as a Tier-C service within the Office 365 Compliance Framework.

NOTE

Visit the Microsoft Trust Center to learn more about how Microsoft protects your data.

Privacy

The information collected and shown through Insights does meets more than 90 regulatory and industry standards, including GDPR and the Family Education Rights and Privacy Act (FERPA) for the security of students and children and other, similar, privacy-oriented regulations. It's important for IT admins to know that the information collected on a per-student basis is intended to be used in a class context only, to allow educators and leaders to determine students' behavior. The information is collected for meaningful learning activities, such as class meetings attendance, posting messages, responding to classmates' posts, working on assignments, editing files, and more. We don't show information about private chat or a Teams login, as an example.

Our goal is to help educators to understand engagement and shine a spotlight on student learning. While these class activities can be focused down to actions at the student level, there is no positive or negative value assigned to these actions by Microsoft Teams, and there is no judgmental identification of individual students based on criteria. The information in Insights informs an educator that, for example, a student has not been active in the tool during a certain period in time, or has completed all their assignments last week on-time. It remains the responsibility of the educator to interact with the student and that student's family or guardians to determine the underlying reason for any activity or inactivity detected.

Data collection

- We collect data for Insights when Education Analytics is turned on for the tenant. The data is collected from Teams activity in order to surface actionable insights for teaching and learning.
- Guests data *does not* collected for Insights.
- By default, Education Analytics is turned **On**.

Currently, this data is pulled from the following areas of student and educator activity in class teams:

TEAMS COMPONENT	DATA COLLECTED
Assignments	Opening, turning in, and grade on assignments.
Channel engagement	Visiting a channel, creating a post, replying to and liking a post (not including chat content).
Files	Uploading, downloading, accessing, modifying, commenting on, and sharing a file (not including file content).
Meetings	Attendance (not including meeting content).

Data location

Insights data for European-based tenants is stored on servers in Europe. Data for US-based tenants is stored on servers in the United States. If you use Insights and your Office 365 tenant is in a region outside of Europe or the United States, your data will be stored in the appropriate geographic region.

Performance and reliability

Insights is designed to handle a high volume of data collected from Teams activity with optimal performance and reliability.

The data collection process takes place on separate servers regardless of the installation of the Insights tab in Teams. The Insights tab or personal app does not affect application performance or network bandwidth for educators and students using the rest of Teams functionality.

> **TIP**
>
> Read Help for low-bandwidth situations for Teams for EDU about using Teams for Education when bandwidth is low.

How to delete your data

Education services stores student and educator actions performed in the context of a class team. This data is considered a co-mingled data set and therefore isn't automatically deleted from the service once student or educator user accounts are deleted from your organization.

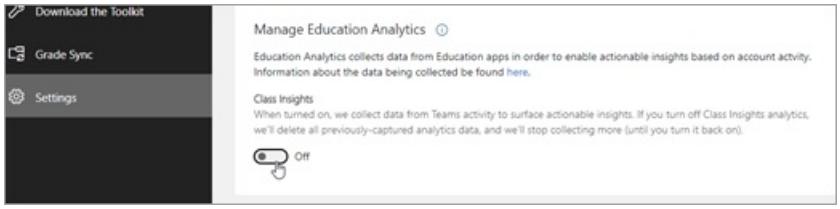
> **NOTE**
>
> Deleting data has a negative impact on Insights' ability to analyze class team engagement over time.

- Open a support ticket at https://edusupport.microsoft.com/support. The support ticket must state clearly the request for a GDPR Delete DSR operation and contain the user object ID to be deleted. There is no ability to limit the data set or time window of the deletion.
- Once filed, the support ticket waits in the queue for one week in order to meet compliance minimal retention policy. You have the opportunity to cancel the operation during this time.
- After one week, the Education Analytics team takes action to ensure all data related to the user ID is deleted from the service. Microsoft support monitors the ICM ticket and will notify you once the deletion process is complete, in no more than 28 days.

Turn Insights off and on using School Data Sync (SDS)

School Data Sync (SDS) helps to automate the process of importing and synchronizing Student Information System (SIS) data with Office 365.

The use of Insights does not require the use of SDS. However, you may choose to opt out from Education Analytics at any time by turning off the toggle in the SDS Admin Center under **Settings** > **Manage Education Analytics**.



By default, Education Analytics, and therefore Insights, is turned on. When you opt out of Analytics, we delete all data collected for the Insights tab. Turn Analytics back on, and we start collecting data from the time it's re-enabled.

Additional resources

- Educator's guide to Insights

Assignments in Teams for Education

12/5/2020 • 3 minutes to read • Edit Online

Assignments are tasks or units of work assigned to a student or team member in a class as part of their study. You can create assignments within your Teams class.

Learn more about Assignments.

> **NOTE**
> For details about Teams assignments on different platforms, see Teams features by platform.

Assignments in the Microsoft Teams admin center

With the admin settings in Microsoft Teams admin center, you can turn the following features on or off to be available for students and teachers within your organization. The following are settings related to Assignments:

Weekly guardian email digest

The emails will contain information about assignments from the previous week and for the upcoming week, and will be sent over the weekend. Information about the email content can be found here. The emails need to be set up and updated by the admins by using School Data Sync (SDS). This feature automatically populates classes for Teams with student rosters from the school's student information system (SIS). The steps to enable this feature are:

1. Import parent contact information via Parent and Guardian Sync in SDS. For instructions on how to enable Parent and Guardian Sync, see Enabling Parent and Guardian Sync.
2. Turn on the Guardian Setting in the Microsoft Teams admin center, as the setting is turned off by default. This will enable teachers to send out a weekly digest.

   > **NOTE**
   > Teachers can opt-out of the digest by deselecting the setting inside their own personal class team (**Assignment Settings > Parent/Guardian Emails**).

To verify that Parents will get the email the following three items must be true:

- Email address attached to the student profile in SDS and tagged as *Parent* or *Guardian*. For details, see Parent and Guardian Sync File Format.
- Students belong to at least one class in which e-mail is not disabled by the teacher in assignment settings.
- The emails will contain information about assignments that had a due date in the previous week or in the upcoming week.

This setting is off by default.

MakeCode

Microsoft MakeCode is a block-based coding platform that brings computer science to life for all students.

MakeCode is a Microsoft product that is subject to the Microsoft terms of use and privacy policies.

This setting is off by default. To enable MakeCode assignments in Teams, in the **Teams Admin Center**, navigate to

the **Assignments** section and turn the MakeCode toggle option to **On**. Click **Save** and allow a few hours for these settings to take effect.

For more information on how this feature works, see this video demonstration.

Learn more about MakeCode.

Turnitin

Turnitin is a plagiarism detection service. This is a third-party product or service that is subject to its own terms and privacy policy. You are responsible for your use of any third-party products and services.

This setting is off by default.

In order to successfully enable Turnitin for your organization, you will need to already have a Turnitin subscription. You will need to enter the following additional information, which can be found in your Turnitin admin console:

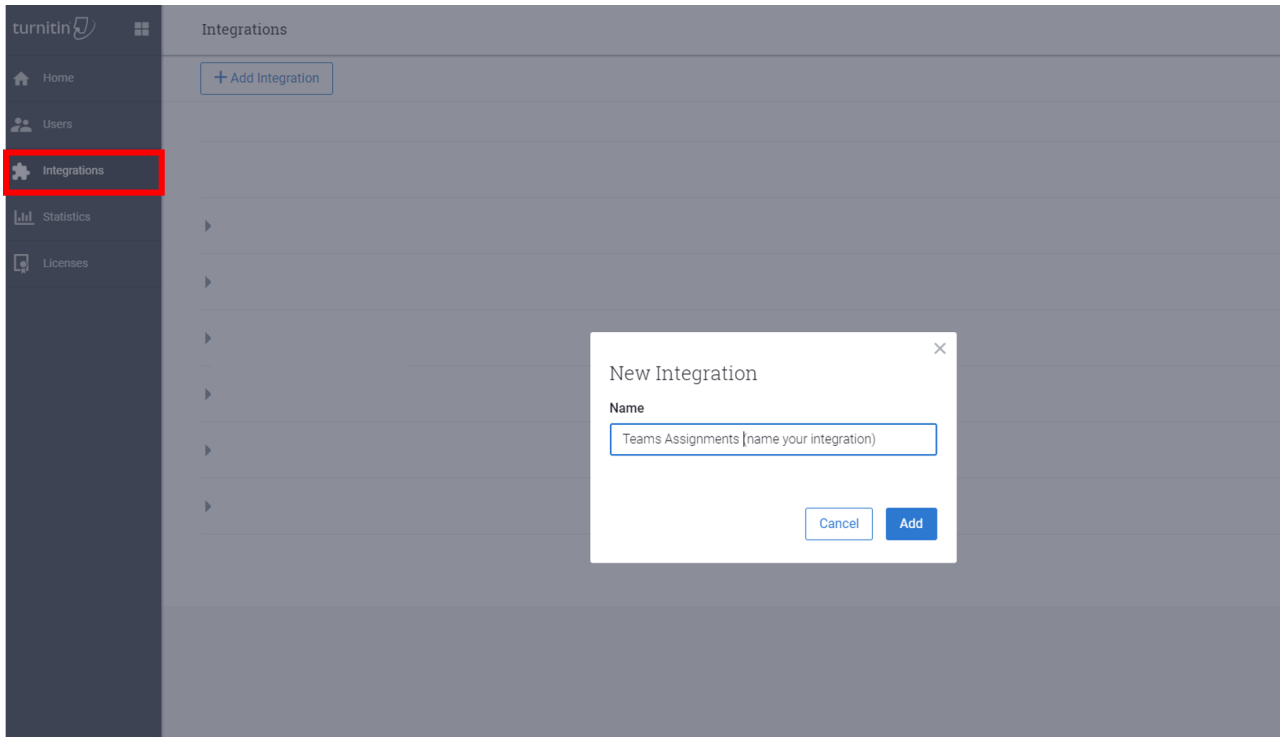
- **TurnitinApiKey**: This is a 32-character GUID found in the admin console under Integrations.
- **TurnitinApiUrl**: This is the HTTPS URL of your Turnitin admin console.

Here are some instructions to help you obtain this information.

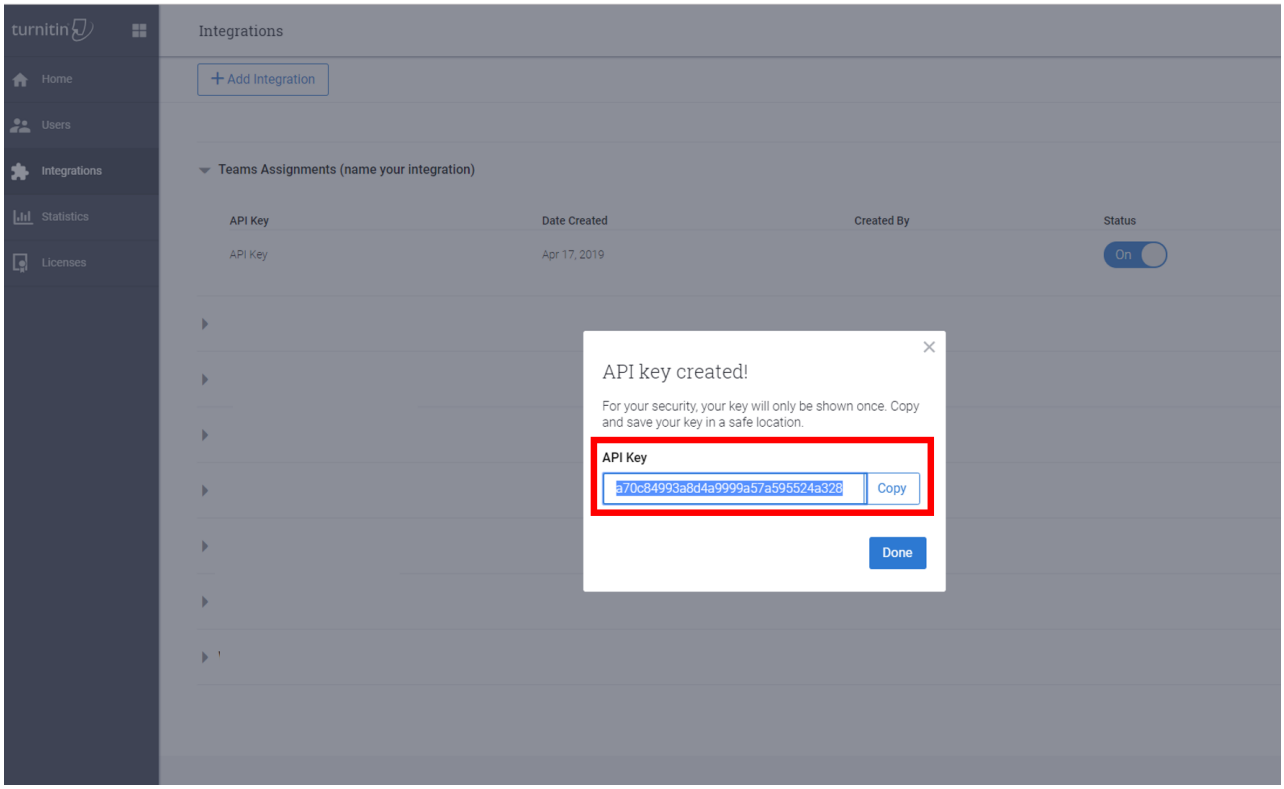
The **TurnitinApiUrl** is the host address of your admin console. Example: `https://your-tenant-name.turnitin.com`

The admin console is where you can create an integration and an API key associated with the integration.

Select **Integrations** from the side menu, then select **Add Integration** and give the integration a name.



The **TurnitinApiKey** will be given to you after you follow the prompts. Copy the API key and paste it into the Microsoft Teams admin center. This is the only time you can view the key.



Upon clicking the **Save** button in the admin center for this setting, please allow a few hours for these settings to take effect.

Ready to start using the Turnitin integration in Teams? Sign up for the early access program.

Microsoft Teams resources for Education admins

11/2/2020 • 2 minutes to read • Edit Online

Resources for remote learning

Does your school or university need to enable Microsoft Teams for remote learning? Get up and running quickly with the Getting Started one-pager and any of the below adoption materials!

Adoption content

Get your school excited about Microsoft Teams with emails, posters, handouts, and more resources that you are free to use now. You can also reach students online and across campus with the new digital toolkit filled with banners, GIFs, and videos. Get started today!

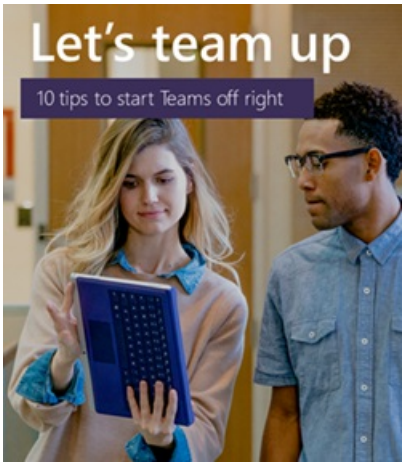
Please read the terms and conditions before you use these materials.

Physical assets

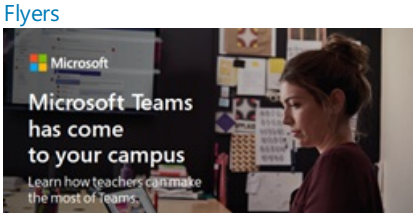
Posters - customizable and print-ready



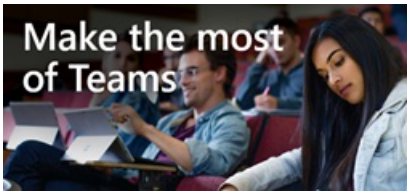
Handouts



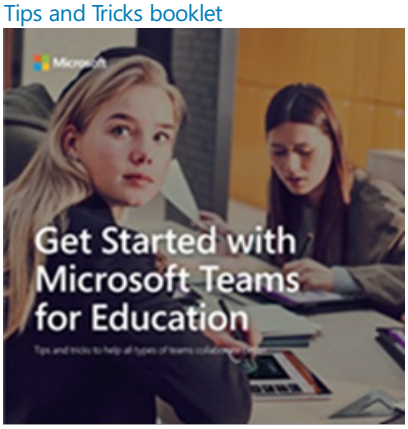
Flyers



Book adverts



Tips and Tricks booklet



Digital assets

Be sure to check out the Digital Toolkit Guidance to maximize your Teams launch!

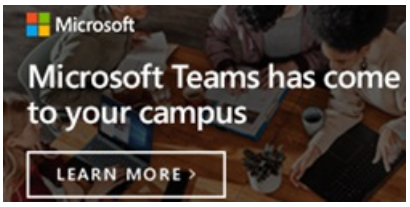
Email templates



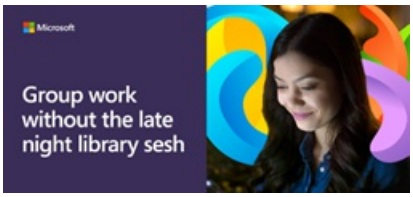
GIFs



Web banners



Videos



Digital screen adverts



Call to action

- Visit the Teams for Education page for trainings, videos, and interactive demos
- Turn on Teams in the Microsoft 365 admin center (sign in as an Office 365 admin)
- Download Teams clients: Get Teams on all your devices
- Learn more about Office 365 for Education at the Education help center

Additional resources

- Teams roadmap
- Stay up to date with our Tech Community Blog
- Teams PowerShell overview

- Send a suggestion
- Contact support
- Ask the Teams community
- Find more resources for education

Microsoft Education governance FAQ for admins

6/8/2020 • 6 minutes to read • Edit Online

TIP

Watch the following session to learn about more about management in Microsoft Teams: Governance, management and lifecycle in Microsoft Teams

How do I control team creation? I'm worried students are going to create inappropriate teams.

To avoid inappropriate or misleading names, or just to provide more structure for how teams are named, you can use the Microsoft 365 Groups naming policy (currently in preview):

- **Prefix-Suffix naming policy** You can use prefixes or suffixes to define the naming convention of teams (groups), for example, **GRP_US_My Group_Engineering**. The prefixes and suffixes can be fixed strings or user attributes (such as **[Department]**) that are added to the name based on the user who's creating the team.
- **Custom Blocked Words** You can upload a set of words that users in a specific organization are blocked from using in names of teams they create. For example, you can block the terms **CEO**, **Payroll**, and **HR** from being used in team names for groups they don't apply to.
- **Classification** You can create classifications that the users in your organization can set when they create a Microsoft 365 Group.

IMPORTANT

Using the Microsoft 365 Groups Naming Policy requires Azure Active Directory Premium P1 licenses or Azure AD Basic EDU licenses for each unique user that is a member of one or more Microsoft 365 groups.

For detailed instructions, see Office groups naming policy.

NOTE

If teams are created automatically by using the input from another system (for example, School Data Sync), verify that the input data complies with the naming policy you've configured; if it doesn't, team creation will fail.

Can I see who created a team?

To find out who created a specific team, see Search the audit log for events in Microsoft Teams.

Can I control who can create teams?

In general, we recommend against preventing anyone from creating teams. If everyone can create teams, Teams is more likely to be widely adopted. Faculty, teachers, or students can use Teams to create study groups or special interest groups. This will help Teams be accepted inside and outside of the classroom.

In our experience, user education helps ensure responsible Teams usage. As soon as users understand that creating teams isn't anonymous, they understand the implications of carelessly creating them and tend to shy away from misusing the tool.

If you're sure you want to control who can create teams, see Manage who can create Microsoft 365 Groups.

How do I automatically create a team for each course at the beginning of the semester or quarter?

At the start of each semester or quarter, you'll need a number of new teams. It might make sense to take an automated approach to create these teams automatically, populate them with the right users, and set the right permissions:

- School Data Sync can create Microsoft 365 Groups for Exchange Online and SharePoint Online, class teams for Microsoft Teams and OneNote Class notebooks, school groups for Intune for Education, and rostering and single sign-on (SSO) integration for many other third-party applications. Learn more at Overview of School Data Sync.
- With PowerShell, you can create teams and channels, and configure settings automatically. See Microsoft Teams PowerShell for more information.
- You can use the Microsoft Graph API (currently in beta) to create, configure, clone, and archive teams. See Use the Microsoft Graph API to work with Microsoft Teams for more information.

> **TIP**
> School Data Sync creates a Microsoft 365 Group for each class synced and enables hidden group membership so only teachers and students within the class can see the members of that class. If using a different process to create class groups use the HiddenGroupMembershipEnabled parameter of the New-UnifiedGroup cmdlet to meet the same privacy requirements.

How do I deal with teams when the semester or quarter ends?

We recommend that you first think about how you want to handle Teams data when the school semester or quarter is over: whether to delete it or keep it available for students even after they've completed the course. You'll want to keep the school calendar in mind so any policies you set don't conflict with holidays. You can use the following tools to implement your strategy:

- **Retention policy:** Use this to delete all data older than an age you specify to make sure that old data is removed from chats (for all or some users) and channels. You can also configure Teams to retain content so it can't be deleted. For more information, see Retention policies for Microsoft Teams.
- **Expiry policy:** Configure teams to expire after a certain number of days. Thirty days before expiration, all owners of a team are notified that their team needs to be renewed, otherwise it will be deleted (though an administrator can recover deleted teams for an additional 30 days). This setting is very useful for making sure unused teams are sunsetted. Learn more at Microsoft 365 group Expiration Policy.
- **Archive team:** This setting puts teams into read-only mode. They can still be browsed and searched, but no one can add any new posts. Archive or restore a team describes how team owners can archive a team; Team owners can also use the Graph API (beta) to archive or restore a team.

> **IMPORTANT**
> Using the Microsoft 365 Groups Expiration Policy requires Azure Active Directory Premium P1 licenses for each unique user that is a member of one or more Microsoft 365 groups.

Are there team templates for my faculty members to use when creating a team?

Yes. Users can select **Create Team from existing template** when creating a new team, and Teams owners can also use the Graph API (beta) to create a new team from the available templates.

What tasks can I automate via PowerShell or Graph?

The Microsoft Graph API (beta) can do the following:

- Create a team.
- Add members and owners.
- Add channels.
- Add apps.
- Shortcut those steps by cloning an existing team, and get its tabs too.
- Give the user a link to the team you just created.
- Remove members, owners, channels, and apps when you no longer need them.
- Archive the team when it's no longer active.
- Delete the team.
- Create a channel thread

PowerShell can do the following:

- Create a team.
- Add members and owners.
- Add channels.
- Remove members, owners, and channels when you no longer need them.
- Delete the team.

> **TIP**
> The Graph API and PowerShell cmdlets are constantly adding functionality. Make sure to check the Microsoft Graph API (beta) and PowerShell articles often for feature enhancements.

Can I control what Teams features my faculty and students have access to?

Yes. You can use policies to control specific messaging, meeting, calling, and live event features your users have access to. You can use tenant-wide settings to apply the same settings to all, or apply user-level policies if required.

For more details about Teams policies, see Manage Microsoft Teams settings for your organization.

Can I control what external parties my faculty and students collaborate with?

You can use guest access to invite users from outside of your tenant, which can be useful for research collaboration or guest lectures:

- Use domain whitelisting to allow or block guests based on their domain.
- Turn guest access on and off for particular Microsoft 365 Groups and teams, to control which teams can (and can't) invite guests.
- Use the audit log to see which alerts were sent to invited guests.

For more information, see Guest access in Microsoft 365 Groups.

What information can I review about existing teams?

You can check the audit logs to see:

- Who was invited as a guest to which team.
- Who created which team.

For more information, see Search the audit log for events in Microsoft Teams.

Teams evolves so quickly. How can I stay up-to-date?

We recommend the following resources to get the latest updates on Teams:

- What's new in Microsoft Teams
- Microsoft Teams blog

Installing the Moodle integration with Microsoft Teams

11/2/2020 • 10 minutes to read • Edit Online

Moodle, the most popular and open-source Learning Management System (LMS) in the world, is now integrated with Microsoft Teams! This integration helps educators and teachers collaborate around Moodle courses, ask questions about their grades and assignments and stay updated with notifications -- right within Teams!

To help IT admins easily set this integration up, we have updated our open-source Moodle Plugin with the following capabilities:

- Auto-registration of your Moodle server with Azure AD.
- One-click deployment of your Moodle Assistant bot to Azure.
- Auto-provisioning of teams and auto-synchronization of team enrollments for all or select Moodle courses.
- Auto-installation of the Moodle tab and the Moodle Assistant bot into each synchronized team. (Coming soon)
- One-click publishing of the Moodle app into your private Teams App Store. (Coming soon)

To learn more about the functionality this integration provides, go here.

Prerequisites

In order to install and configure this application you'll need:

1. Moodle administrator credentials
2. Azure AD administrator credentials
3. An Azure subscription you can create new resources in

Step 1: Install the Moodle Plugin

The Moodle integration in Microsoft Teams is powered by the open source Moodle plugin set. To install the plugin in your Moodle server:

1. First, download the Moodle plugin set and save it to your local computer. You'll need to use version 3.5 or newer.
   - Installing the local_o365 plugin will also install the auth_oidc and boost_o365Teams plugins.
2. Login to your Moodle server as an administrator, and select **Site administration** from the left navigation panel.
3. Select the **Plugins** tab, and then click **Install plugins**.
4. Under the **Install plugin from ZIP file** section click the **Choose a file** button.
5. Select the **Upload a file** options from the left navigation, browse for the file you downloaded above and click **Upload this file**.
6. Select the **Site administration** option from the left navigation panel again to return to your admin dashboard. Scroll down to the **Local plugins** and click the **Microsoft Office 365 Integration** link. Keep this configuration page open in a separate browser tab as you'll be using it throughout the rest of this process.

You can find more information on how to install Moodle plugins in the Moodle documentation.

Important Note: Keep your Microsoft 365 or Office 365 Moodle Plugin configuration page open in a separate

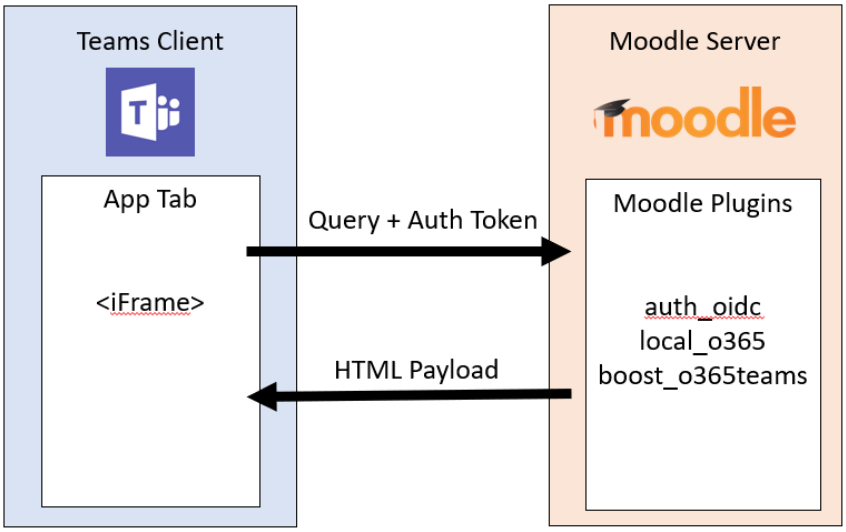
browser tab as you will be returning to this set of pages throughout this process.

Don't have a Moodle site already? You might want to check out our Moodle on Azure repo where you can quickly deploy a Moodle instance on Azure and customize it to your needs.

Step 2: Configure the connection between the Microsoft 365 or Office 365 plugin and Azure Active Directory

Next you'll need to register Moodle as an application in your Azure Active Directory. We've provided a PowerShell script to help you complete this process. The PowerShell Script provisions a new Azure AD application for your Microsoft 365 or Office 365 organization, which will be used by the Moodle Plugin. The script will provision the app for your Microsoft 365 or Office 365 tenant, set up all the required Reply URLs and Permissions for the provisioned app and return the AppID and Key. You can use the generated AppID and Key in your Moodle Plugin Setup Page to configure your Moodle server with Azure AD. If you want to see the detailed manual steps that the PowerShell script is automating, you can find them in the full documentation for the plugin.

Moodle tab for Microsoft Teams information flow



1. From the Microsoft 365 or Office 365 Integration plugin page, select the **Setup** tab.
2. Click the **Download PowerShell Script** button and save it to your local computer.
3. You'll need to prepare the PowerShell script from the ZIP file. To do so:
   - Download and extract the `Moodle-AzureAD-Powershell.zip` file.
   - Open the extracted folder.
   - Right-click on the `Moodle-AzureAD-Script.ps1` file and select **Properties**.
   - Under the **General** tab of the Properties window, check the `Unblock` box next to the **Security** attribute at the bottom.
   - Click **OK**.
   - Copy the directory path of the extracted folder.
4. Next you'll run PowerShell as an administrator:
   - Click Start.
   - Type PowerShell.
   - Right-click Windows PowerShell.
   - Click "Run as Administrator".
5. Navigate to the unzipped directory by typing `cd ...\...\Moodle-AzureAD-Powershell` where `...\...` is the path to the directory.
6. Execute the PowerShell script by:
   - Enter `Set-ExecutionPolicy -ExecutionPolicy RemoteSigned -Scope CurrentUser`.

- Enter `.\Moodle-AzureAD-Script.ps1`.
- Log in to your Microsoft 365 or Office 365 Administrator account in the pop-up window.
- Enter the name of the Azure AD Application (Ex. Moodle/Moodle plugin).
- Enter the URL of your Moodle server.
- Copy the **Application ID** and **Application Key** generated by the script and save them.

7. Next you'll need to add the Id and Key to the Moodle Plugin. Return to the plugin administration page (Site administration > Plugins > Microsoft 365 Integration).
8. On the **Setup** tab add the **Application Id** and **Application Key** you copied previously, then click **Save changes**.
9. Once the page refreshes you should now see a new section **Choose connection method**. Click the checkbox labeled **Default** and then click **Save changes** again.
10. Once the page refreshes you will see another new section **Admin consent & additional information**.
    - Click the **Provide Admin Consent** link, enter your Microsoft 365 or Office 365 Global Administrator credentials, then **Accept** to grant the permissions.
    - Next to the **Azure AD Tenant** field click the **Detect** button.
    - Next to the **OneDrive for Business URL** click the **Detect** button.
    - Once the fields populate, click the **Save changes** button again.
11. Click the **Update** button to verify the installation, then **Save changes**.
12. Next you'll need to synchronize users between your Moodle server and Azure Active Directory. Depending on your environment, you may select different options during this stage. Note that the configuration you set here will run with each Moodle cron run (typically once a day) to keep everything in sync. To get started:
    - Switch to the **Sync Settings tab**
    - In the **Sync users with Azure AD** section, select the checkboxes that apply to your environment. Typically you would select at least:
        - Create accounts in Moodle for users in Azure AD
        - Update all accounts in Moodle for users in Azure AD
    - In the **User Creation Restriction** section you can setup a filter to limit the Azure AD users that will by synced to Moodle.
    - The **User Field Mapping** section will allow you to customize the Azure AD to Moodle User Profile field mapping.
    - In the **Teams Sync** section you can choose to automatically create Groups (i.e. Teams) for some, or all, of your existing Moodle courses.
13. To validate the cron jobs (and run them manually if you wish to for the first run) click the **Scheduled tasks management page** link in the **Sync users with Azure AD** section. This will take you to the **Scheduled Tasks** page.
    - Scroll down and find the job **Sync users with Azure AD** job and click **Run now**.
    - If you chose to create Groups based on existing courses, you can also run the **Create user groups in Office 365** job.
14. Return to the plugin administration page (Site administration > Plugins > Microsoft 365 Integration) and select the **Teams Settings** page. You'll need to configure some security settings to enable the Teams app integration.
    - To enable OpenID Connect, click the **Manage Authentication** link, and click the eye icon on the **OpenId Connect** line if it is greyed out.
    - Next you'll need to enable frame embedding. Click the **HTTP Security** link, then click the checkbox next to **Allow frame embedding**.
    - The next step is to enable web services which will enable the Moodle API features. Click the **Advanced Features** link, then make sure the checkbox next to **Enable web services** is checked.
    - Finally you'll need to enabled the external services for Microsoft 365 or Office 365. Click the **External services** link then:

- Click **Edit** on the **Moodle Office 365 Webservices** row.
- Mark the checkbox next to **Enabled**, then click **Save Changes**

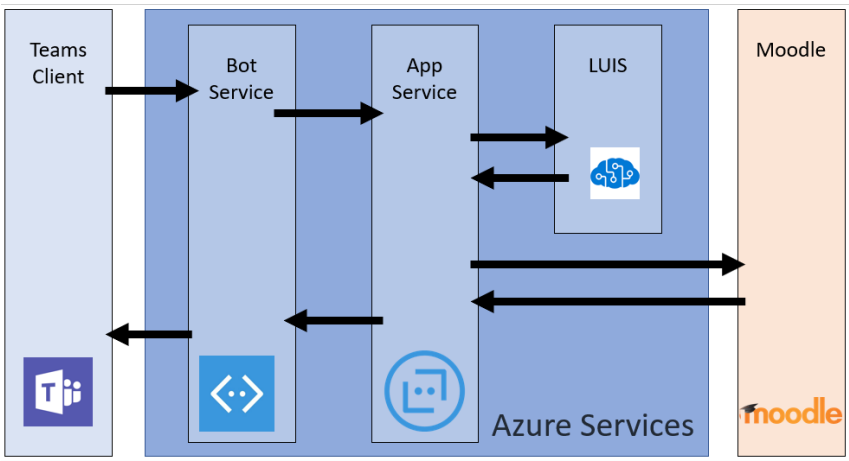
- Next you'll need to edit your authenticated user permissions to allow them to create web service tokens. Click the **Editing role 'Authenticated user'** link. Scroll down and find the **Create a web service token** capability and mark the **Allow** checkbox.

Step 3: Deploy the Moodle Assistant Bot to Azure

The free Moodle Assistant Bot for Microsoft Teams helps teachers and students answer questions about their courses, assignments, grades and other information in Moodle. The bot also sends Moodle notifications to students and teachers right within Teams. This bot is an open source project maintained by Microsoft, and is available on GitHub.

> **NOTE**
> In this section you will deploy resources to your Azure subscription, and all resources will be configured using the **free** tier. Depending on the usage of your bot, you may need to scale these resources. If you want to just use the Moodle tab without the bot, skip to step 4.

Moodle bot information flow



To install the bot, you'll first need to register it on the Microsoft Identity Platform. This allows your Bot to authenticate against your Microsoft endpoints. To register your bot:

1. Return to the plugin administration page (Site administration > Plugins > Microsoft 365 Integration) and select the **Teams Settings** tab.
2. Click the **Microsoft Application Registration Portal** link and login with your Microsoft Id.
3. Enter a name for you app (Eg. MoodleBot) and click the **Create** button.
4. Copy the **Application Id** and paste it into the **Bot Application ID** field on the **Team Settings** page.
5. Click the **Generate New Password** button. Copy the generated password and and paste it into the **Bot Application Password** field on the **Team Settings** page.
6. Scroll to the bottom of the form and click **Save Changes**.

Now that you've generated your Application Id and Password, it's time to deploy your bot to Azure. Click on the **Deploy to Azure** button and fill out the form with the necessary information (the Bot Application Id, Bot Application Password and the Moodle Secret are on the **Team Settings** page, and the Azure information is on the **Setup** page). Once you've got the form filled out, click the check box to agree to the terms and conditions then click the **Purchase** button (all Azure resources are deployed to the free tier).

Once the resources are finished deploying to Azure, you'll need to configure the Moodle plugin with it's messaging endpoint. First, you'll need to get the endpoint from your Bot in Azure. To do that:

1. If you aren't already, log into the Azure portal.
2. In the left pane select **Resource groups**.
3. From the list select the resource group you just used (or created) while deploying your Bot.
4. Select the **WebApp Bot** resource from the list of resources in the group.
5. Copy the **Messaging Endpoint** from the **Overview** section.
6. In Moodle, open the **Team Settings** page of your Moodle Plugin.
7. In the **Bot Endpoint** field paste the URL you just copied and change the word *messages* to *webhook*. The URL should now look like `https://botname.azurewebsites.net/api/webhook`
8. Click **Save Changes**
9. Once your changes have saved, go back to the **Team Settings** tab, click the **Download manifest file** button and save the manifest package to your computer (you'll use it in the next section).

Step 4: Deploy your Microsoft Teams app

Now that you have your Bot deployed to Azure and configured to talk to your Moodle server, it's time to deploy your Microsoft Teams app. To do this you'll load the manifest file you downloaded from the Moodle Plugin Team Settings page in the previous step.

Before you can install the app you'll need to make sure external apps and sideloading of apps is enabled. To do so you can follow these steps. Once you've ensured that external apps are enabled, you can follow the steps below to deploy your app.

1. Open Microsoft Teams.
2. Click the **Store** icon on the lower-left of the navigation bar.
3. Click the **Upload a custom app** link from the list of options. *Note:* If you're logged in as a global administer you'll have the option of uploading the app to your organization's app store, otherwise you'll only be able to load the app for Teams you're a part of ("sideloading").
4. Select the `manifest.zip` package you downloaded previously and click **Save**. If you haven't yet downloaded the manifest package, you can do so from the **Team Settings** tab of the plugin configuration page in Moodle.

Now that you have the app installed you can add the tab to any channel that you have access to. To do so navigate to the channel, click the **+** symbol and select your app from the list. Follow the prompts to finish adding your Moodle course tab to a channel.

That's it! You and your team, can now start working with your Moodle courses directly from Microsoft Teams.

To share any feature requests or feedback with us, please visit our User Voice page.

Assign Microsoft Teams licenses for EDU

3/18/2020 • 3 minutes to read • Edit Online

Microsoft Teams is a digital hub that brings conversations, content, and apps together in one place. Because it's built on Office 365, schools benefit from integration with their familiar Office apps and services. Your institution can use Microsoft Teams to create collaborative classrooms, connect in professional learning communities, and communicate with school staff all from a single experience in Office 365 for Education.

To get started, IT administrators need to use the Microsoft 365 Admin Center to enable Microsoft Teams for your school. Once complete, you must assign licenses to user accounts so your faculty, staff, and students can access Office 365 services, such as Microsoft Teams.

You can assign licenses to user accounts either individually or automatically through group membership. This article will walk you through how to assign Office 365 licenses to an individual or a small set of user accounts via the Microsoft 365 admin center. To assign licenses automatically through group membership, see one of our supporting articles:

- Office 365 Powershell
- Group-based Licensing in Active Directory

You can assign licenses to users on either the **Licenses** page, or on the **Active Users** page. Which method you use depends on whether you want to assign product licenses to specific users, or assign users licenses to specific products.

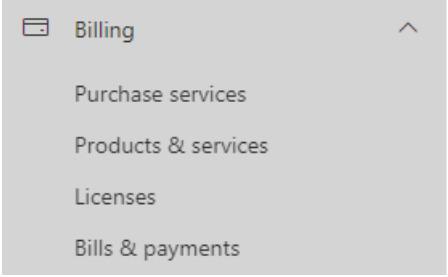
> **NOTE**
> If you're not using the new Microsoft 365 admin center, you can turn it on by selecting the **Try the new admin center** toggle located at the top of the Home page.

Assign licenses to users on the Licenses page

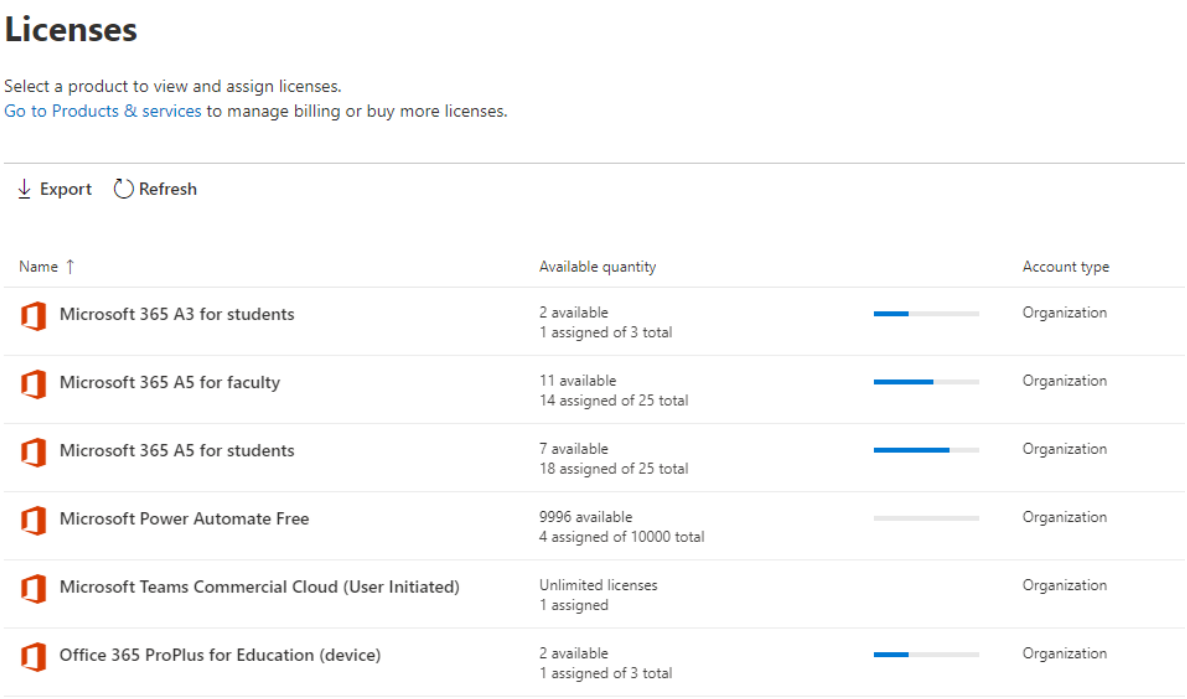
> **NOTE**
> You must be a Global admin, Billing admin, License admin, or User management admin. For more information, see About Office 365 admin roles.

When you use the **Licenses** page to assign licenses, you assign licenses for a specific product for up to 20 users. On the **Licenses** page, you see a list of all the products you have subscriptions for, together with the total number of licenses for each product, how many licenses are assigned, and how many are available.

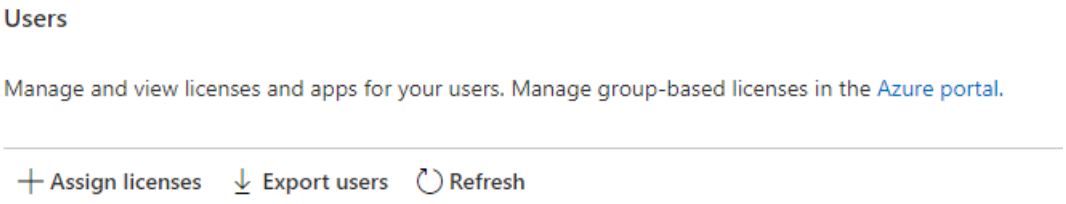
1. In the admin center, go to the **Billing** > Licenses page.



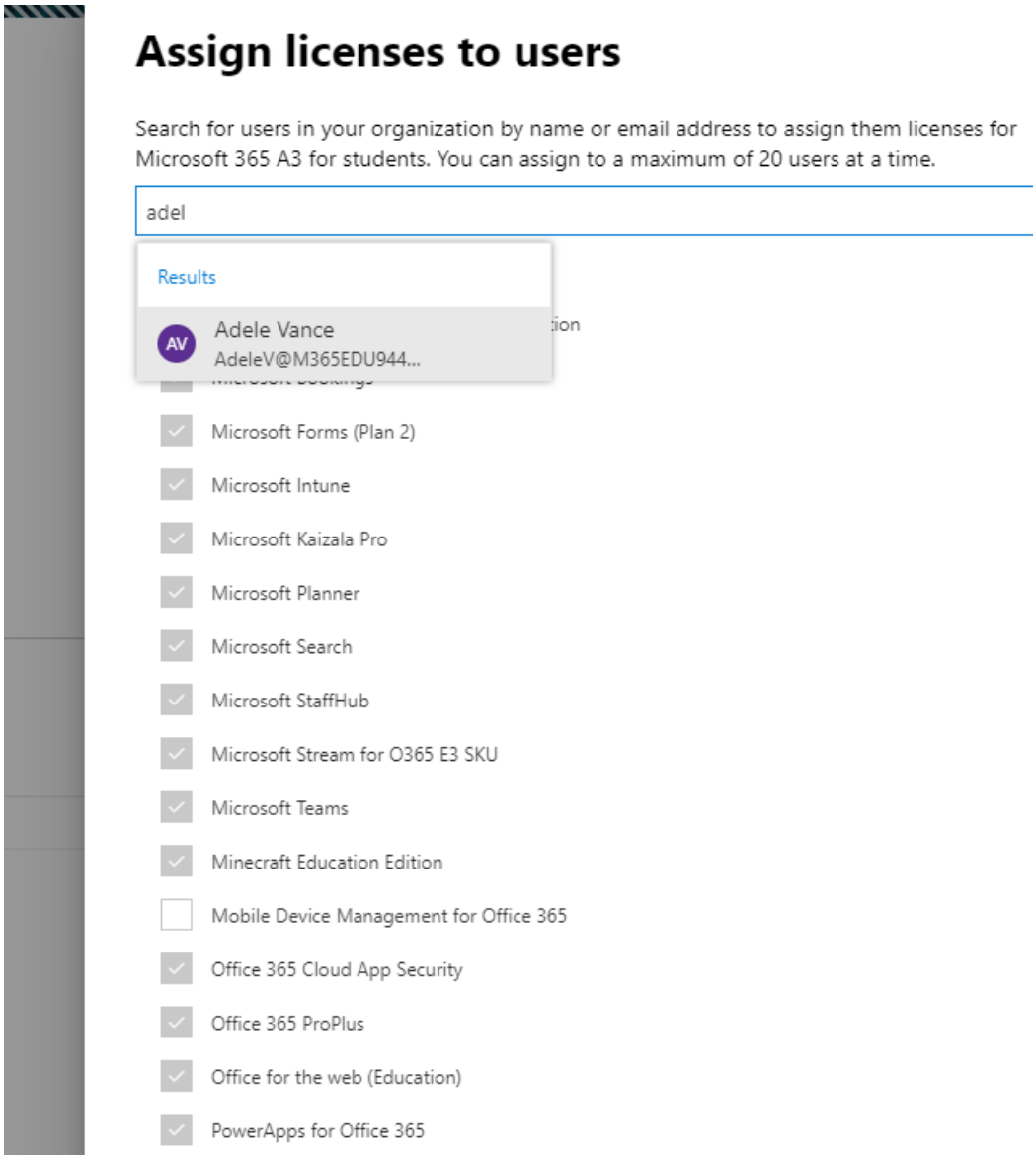
2. Select a product for which you want to assign licenses. Microsoft Teams is part of the free Office 365 A1 for Students SKU.



3. Select **Assign licenses**.



4. In the **Assign licenses to users** pane, begin typing a name, which should generate a list of names. Choose the name you're looking for from the results to add it to the list. You can add up to 20 users at a time.



5. Select **Turn apps and services on or off** to assign or remove access to specific items, such as Microsoft Teams. Ensure **Microsoft Teams** and **Office for the web (Education)** are selected.

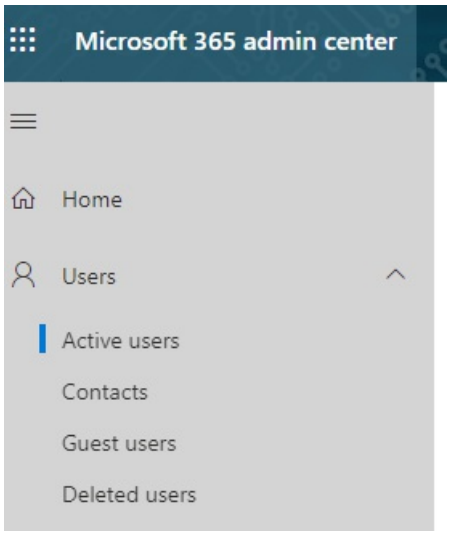
6. When you're finished, select **Assign**, then select **Close**.

To change the apps and services a user has access to:

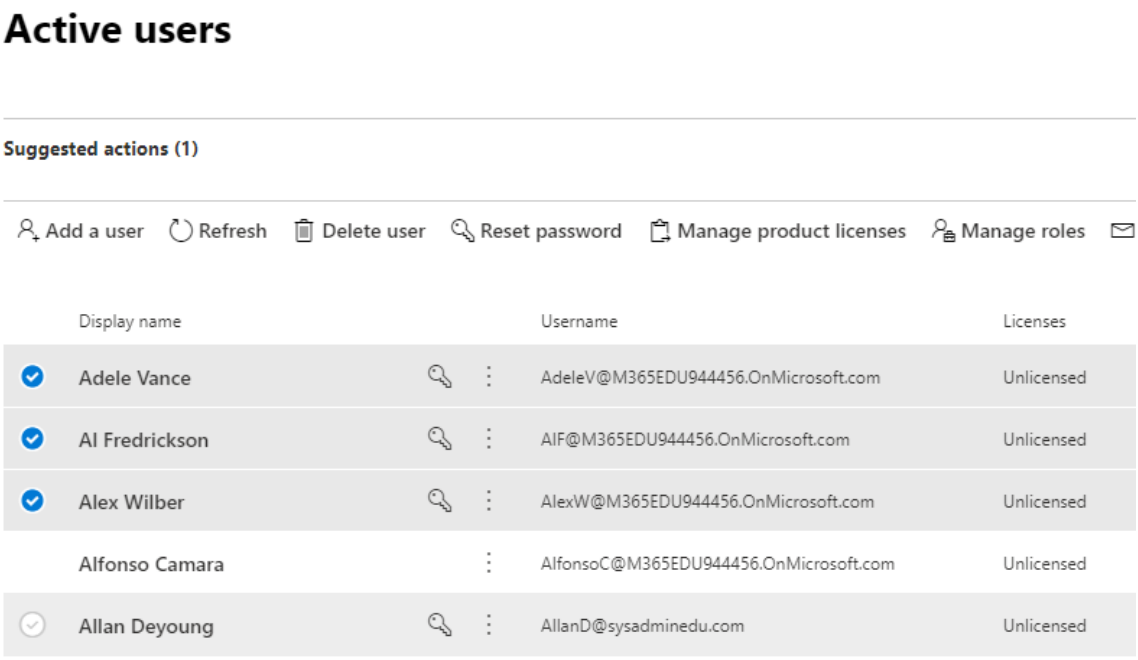
1. Select the row that contains the user.
2. In the right pane, select or deselect the apps and services that you want to give access to, or remove access from.
3. When you're finished, select **Save**, then select **Close**.

Assign licenses to an individual or multiple users on the Active users page

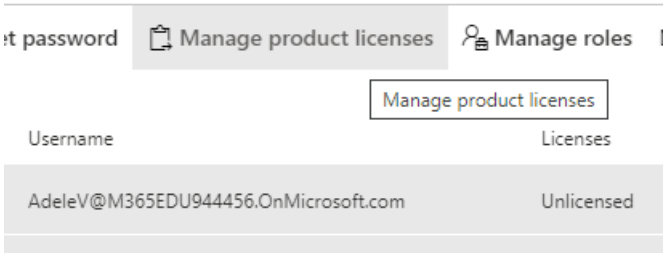
1. In the admin center, go to the **Users** > Active users page.



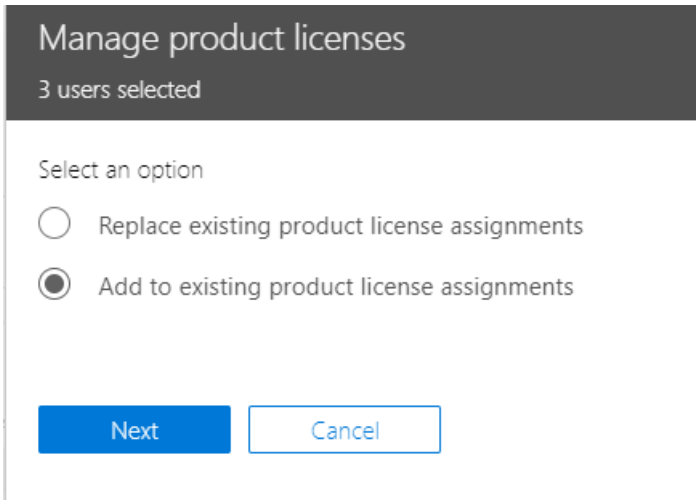
2. Select the circles next to the name(s) of the user(s) you want to assign license(s) to.



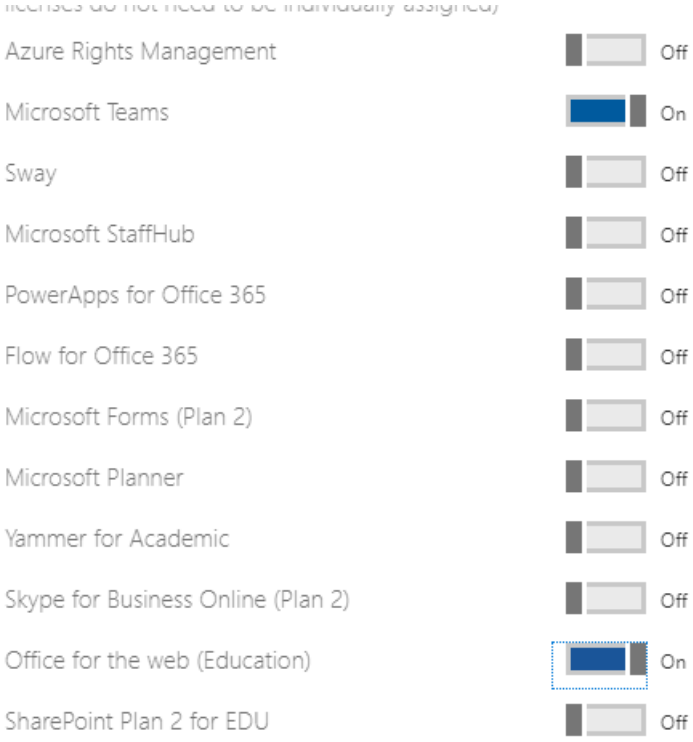
3. At the top select **Manage product licenses**.



4. In the **Manage product licenses** pane, select **Add to existing product license assignments** > **Next**.



5. In the **Add to existing products** pane, switch the toggle to the **On** position for the license that you want the selected users to have. Ensure **Microsoft Teams** and **Office for the web (Education)** are selected.



   By default, all services associated with those license(s) are automatically assigned to the user(s). You can limit which services are available to the users. Switch the toggles to the **Off** position for the services that you don't want the users to have.

6. At the bottom of the pane, select Add > Close.

Education SKU reference

7/31/2020 • 2 minutes to read • Edit Online

This article lists Education Faculty and Student licensing plans (SKUs) and SKU IDs that you can use as a reference when you use PowerShell to identify users in your organization by license type.

Faculty licenses

PLAN NAME	SKUPARTNUMBER	SKUID
Office 365 Education E3 for Faculty	ENTERPRISEPACK_FACULTY	e4fa3838-3d01-42df-aa28-5e0a4c68604b
Office 365 Education for Faculty	STANDARDWOFFPACK_FACULTY	94763226-9b3c-4e75-a931-5c89701abe66
Office 365 Education for Faculty	STANDARDWOFFPACK_IW_FACULTY	78e66a63-337a-4a9a-8959-41c6654dfb56
Office 365 Education E5 for Faculty	ENTERPRISEPREMIUM_FACULTY	a4585165-0533-458a-97e3-c400570268c4
Office 365 Education E5 without PSTN Conferencing for faculty	ENTERPRISEPREMIUM_NOPSTNCONF_FACULTY	9a320620-ca3d-4705-a79d-27c135c96e05
Office 365 Education E1 for Faculty	STANDARDPACK_FACULTY	a19037fc-48b4-4d57-b079-ce44b7832473
Office 365 Education E3 for Faculty	ENTERPRISEPACK_EDULRG	f5a9147f-b4f8-4924-a9f0-8fadaac4982f
Office 365 Education E4 for Faculty	ENTERPRISEWITHSCAL_FACULTY	16732e85-c0e3-438e-a82f-71f39cbe2acb
Microsoft 365 Education A3 for Faculty	M365EDU_A3_FACULTY	4b590615-0888-425a-a965-b3bf7789848d
Microsoft 365 Education A5 for Faculty	M365EDU_A5_FACULTY	e97c048c-37a4-45fb-ab50-922fbf07a370
Microsoft 365 A5 without Audio Conferencing for Faculty	M365EDU_A5_NOPSTNCONF_FACULTY	e578b273-6db4-4691-bba0-8d691f4da603
Office 365 Education for Homeschool for Faculty	STANDARDWOFFPACK_HOMESCHOOL_FAC	43e691ad-1491-4e8c-8dc9-da6b8262c03b
Office 365 A1 for Faculty (for Device)	STANDARDWOFFPACK_FACULTY_DEVICE	af4e28de-6b52-4fd3-a5f4-6bf708a304d3

Student licenses

PRODUCT NAME	SKUPARTNUMBER	SKUID
Office 365 Education E3 for Students	ENTERPRISEPACK_STUDENT	8fc2205d-4e51-4401-97f0-5c89ef1aafbb
Office 365 Education for Students	STANDARDWOFFPACK_IW_STUDENT	314c4481-f395-4525-be8b-2ec4bb1e9d91
Office 365 Education E5 for Students	ENTERPRISEPREMIUM_STUDENT	ee656612-49fa-43e5-b67e-cb1fdf7699df
Office 365 Education E5 without PSTN Conferencing for Students	ENTERPRISEPREMIUM_NOPSTNCONF_STUDENT	1164451b-e2e5-4c9e-8fa6-e5122d90dbdc
Office 365 Education E1 for Students	STANDARDPACK_STUDENT	d37ba356-38c5-4c82-90da-3d714f72a382
Office 365 Education E4 for Students	ENTERPRISEWITHSCAL_STUDENT	05e8cabf-68b5-480f-a930-2143d472d959
Microsoft 365 Education A3 for Students	M365EDU_A3_STUDENT	7cfd9a2b-e110-4c39-bf20-c6a3f36a3121
Microsoft 365 Education A3 for Students use benefits	M365EDU_A3_STUUSEBNFT	18250162-5d87-4436-a834-d795c15c80f3
Microsoft 365 Education A5 for Students	M365EDU_A5_STUDENT	46c119d4-0379-4a9d-85e4-97c66d3f909e
Microsoft 365 A5 Student use benefits	M365EDU_A5_STUUSEBNFT	31d57bc7-3a05-4867-ab53-97a17835a411
Microsoft 365 A5 without Audio Conferencing for Students	M365EDU_A5_NOPSTNCONF_STUDENT	a25c01ce-bab1-47e9-a6d0-ebe939b99ff9
Microsoft 365 A5 without Audio Conferencing for Students use benefit	M365EDU_A5_NOPSTNCONF_STUUSEBNFT	81441ae1-0b31-4185-a6c0-32b6b84d419f
Office 365 A3 for Students	ENTERPRISEPACKPLUS_STUDENT	98b6e773-24d4-4c0d-a968-6e787a1f8204
Office 365 A3 Student use benefit	ENTERPRISEPACKPLUS_STUUSEBNFT	476aad1e-7a7f-473c-9d20-35665a5cbd4f
Office 365 A5 Student use benefit	ENTERPRISEPREMIUM_STUUSEBNFT	f6e603f1-1a6d-4d32-a730-34b809cb9731
Office 365 A5 without Audio Conferencing for Students use benefit	ENTERPRISEPREMIUM_NOPSTNCONF_STUUSEBNFT	bc86c9cd-3058-43ba-9972-141678675ac1
Office 365 Education for Homeschool for Students	STANDARDWOFFPACK_HOMESCHOOL_STU	afbb89a7-db5f-45fb-8af0-1bc5c5015709
Office 365 A1 for Students (for Device)	STANDARDWOFFPACK_STUDENT_DEVICE	160d609e-ab08-4fce-bc1c-ea13321942ac

PRODUCT NAME	SKUPARTNUMBER	SKUID
Office 365 A1 Plus for students	STANDARDWOFFPACK_IW_STUDENT	e82ae690-a2d5-4d76-8d30-7c6e01e6022e

Related topics

- Assign policies to large sets of users in your school

How to provision Teams at scale for Firstline Workers

7/2/2020 • 17 minutes to read • Edit Online

Do you need to rapidly onboard a large number of users to Microsoft Teams and configure a streamlined experience for them? You can quickly provision identities, provision teams, and assign all relevant policies to control the end user experience by walking through the following instructions.

In this walkthrough, you'll learn how to:

- Create a large number of users.
- Create a large number of teams and set up the appropriate channels.
- Assign licensing at scale.
- Create appropriate Teams Messaging Policies, App Setup Policies, and App Permission Policies.
- Apply those policies to users at scale.
- Assign a large number of users into a designated team.

> **NOTE**
> If you've reviewed this information and feel like you need some help or have some questions, you can **click here** to reach out for White Glove Support.

Prerequisites

Download the assets from this location.

> **IMPORTANT**
> The scripts in the link provided above are provided as-is by Microsoft, and must be modified for your individual needs.

Technical requirements

- Your tenant must have the appropriate number of licenses available that include Microsoft Teams. If you do not already have these licenses, check out Teams Exploratory for a free trial subscription.
- The user taking these steps must have these roles assigned: Global Admin, User Admin, and Teams Service Admin, in Azure AD.
- User must have the rights to install and configure software on their local machine.

Step-by-step process overview

1. **Set up Your Environment**
   a. Download from the GitHub repository containing the sample PowerShell scripts and documentation
   b. Configure the local environment
   c. Setup credentials
   d. Configure PowerShell Modules and environmental variables
2. **Create and Setup Teams**
   a. Create teams
   b. Steps to create teams

   c. Create channels for teams
3. **Create Teams Policies**
   a. Create Teams message policies
   b. Create Teams app setup policies
   c. Create Teams app permission policies
4. **Users and Security Groups**
   a. Create users and security groups
   b. Assign licensing to users via group-based licensing
5. **Assign Users and Policies**
   a. Assign users to Teams
   b. Assign Teams policies to users
   c. OPTIONAL: Convert group membership type
6. **Test and Validate**
   a. Login to Teams with a test user
   b. Check for errors
   c. Error handling
7. **Further reading**

Set up your environment

The following steps will allow you to set up your environment:

Download from the GitHub repository containing sample PowerShell scripts and documentation

Before you can proceed, you'll need to download the scripts at this location.

Configure the local environment

Setting the local environment variables allows the scripts referenced here to be run using relative paths. The rootPath is the root of where you cloned this repository, and the tenantName is in the form **yourTenant.onmicrosoft.com** (https should not be included).

1. Open a PowerShell session and navigate to the scripts folder inside the cloned git repo.
2. Run the script .\SetConfig.ps1 -tenantName [your tenant name] -rootPath "full path to the root of the git repo".

For example: .\SetConfig.ps1 -tenantName contoso.onmicrosoft.com -rootPath "C:\data\source\FLWTeamsScale"

Setup credentials

> **IMPORTANT**
> How credentials are managed in these scripts may not be appropriate for your use, and they're easily changed to meet your requirements. Always follow your company's standards and practices for securing service accounts and managed identities.

The scripts use credentials that are stored as XML files in $ENV:LOCALAPPDATA\keys, that is, the AppData\Local folder. The helper function **Set-Creds** in the module **BulkAddFunctions.psm1** needs to be called to set the credentials used to run these scripts. This technique removes the need for you to authenticate to all various service endpoints while maintaining the credentials in a local store. From within each script, the appropriate credentials are read with the helper function **Get-Creds** and those credentials are used to connect to the various services.

When you call **Set-Creds**, you're prompted to provide an XML file name that will be written to $ENV:LOCALAPPDATA\keys. You might have different credentials for different services. For example, you might have different credentials for MicrosoftTeams, AzureAD, and MSonline, in which case you can run **Set-Creds** more than once, saving each credential file with its own meaningful name.

Examples: Set-Creds msol-cred.xml Set-Creds azuread-cred.xml Set-Creds teams-cred.xml

Run the script **SetCreds.ps1** to save your credentials. You will be prompted with "Performing the operation "Export-Clixml"..." and enter 'Y' to approve.

> **NOTE**
> The account used for the credentials cannot require Multi-Factor Auth (MFA).

Here's an example of how the various scripts use the saved credentials to authenticate:

```
# Connect to MicrosoftTeams
$teams_cred = Get-Creds teams-cred.xml
Connect-MicrosoftTeams -Credential $teams_cred
```

Configure PowerShell modules and environmental variables

You'll need to install and connect to several PowerShell modules, including Azure AD, MSAL, MSCloudUtils, and MicrosoftTeams.

1. Find the **ConfigurePowerShellModules.ps1** in the scripts folder in the repository.
2. From PowerShell, run the **ConfigurePowerShellModules.ps1** script.

Create and set up Teams

In order to communicate and collaborate with your Firstline Workers, you will first need to establish a series of Teams and add standard Channels to those teams, which we'll walk through next.

Create teams

Teams are a collection of people, content, and tools within your organization. For most Firstline Worker-centric organizations, it is best practice to anchor a Team around a physical location. For example, a Team for each of the following:

- Store
- Distribution Center
- Manufacturing Plant
- Hospital
- Grocery Store

Best Practice Discussion: When designing your teams, it's important to keep in mind Teams limits and specifications. For smaller organizations, an org-wide team can be used to streamline communication and complement a physical location structure. For others, a structured physical location Team naming convention helps assist Corporate Communications with Cross Posting to multiple teams simultaneously with ease. For example, you can search and cross-post to all Teams with US in the name to target all US locations. More information on cross-posting can be found here.

Steps to create teams

1. Find the **TeamsInformation.csv** file in the data folder in the repository.
2. Update the information in the **TeamsInformation.csv** file with your organization's specific information. Keep in mind our best practices above.
3. Find the **CreateTeams.ps1** script.
4. From PowerShell, run the **CreateTeams.ps1** script.

Create channels for teams

Channels are dedicated sections within a team to keep conversations organized by specific topic, project, discipline,

and more. Every Team automatically gets a General channel, but from there you can customize your structure according to the needs of your business. For example, your additional channel structure could include:

- **Manufacturing** - Safety, Line 1, Line 2, Corporate Communications, Training
- **Grocery** - Bakery, Produce, Meat, Corporate Communications, Training
- **Healthcare** - Nurses, Doctors, Critical Care Unit 1, Critical Care Unit 2
- **Hospitality** - Front Desk, Maintenance, Housekeeping, Valet and Baggage, Corporate Communications, Training
- **Retail** - Front of Store, Back of Store, Corporate Communications, Training

> **NOTE**
> Channels should not be thought of as a security boundary. They are a means of organizing your workers for the purposes of collaboration.

Best Practice Discussion: When designing your channel structure, it's important to keep things simple, especially when you're looking to onboard a lot of users. Resist the urge to create channels for every situation, role, or topic in order to minimize the need for training. Pick 3-5 channels at most to get started. Additional channels can easily be created as the need arises. In fact, it's okay to just use the General channel alone for now!

Steps to Create Channels for Teams

1. Find the **TeamsChannels.csv** file in the scripts folder in the repository.
2. Update the **TeamsChannels.csv** file with your organization's specific information. Keep in mind our best practices above.
3. Find the **CreateTeamsChannels.ps1** script in the scripts folder in the repository.
4. From PowerShell, run the **CreateTeamsChannels.ps1** script.

Create Teams policies

As an admin, you can use teams policies in Microsoft Teams to control what users in your organization see and can. For example, you can control which applications are pinned to the left rail on your Desktop or Web browser, or the bottom bar on mobile devices, in order to simplify the end user experience when onboarding a large amount of users. Some of these policies can be created with PowerShell, and others have to be manually created in the Teams Admin Console.

Best Practice Discussion: For each of the following policies, we're choosing to actually create two policies: one for Firstline Workers and one for Firstline Managers. You can choose to create as many or as few as you like. For most customers, two is a good place to start, even if you give the same settings to each group initially. As your experience with Teams grows, you may choose to differentiate their experience further and having the two separate policies already created can make that simpler.

Create Teams message policies

Messaging policies are used to control which chat and channel messaging features are available to users in Microsoft Teams.

Best Practice Discussion: While you can use the default Global policy that is created automatically, we have opted to create a custom policy using the steps below to provide a more locked down, simple, and differentiated experience for Firstline Managers and Firstline Workers.

Steps to Create Teams Message Policies

1. Find the **TeamsMessagingPolicies.csv** file in the scripts folder in the repository.
2. Update the **TeamsMessagingPolicies.csv** file with your organization's specific information. Additional information on some of the various options can be found here.
3. Find the **CreateTeamsMessagePolicies.ps1** script in the scripts folder in the repository.

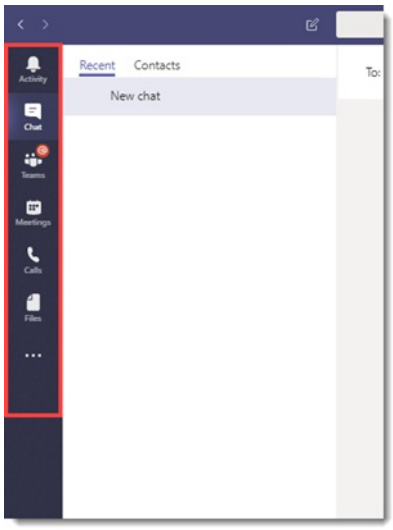
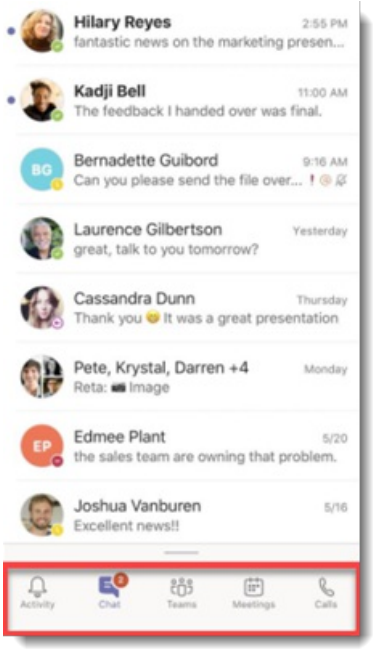
4. From PowerShell, run the **CreateTeamsMessagePolicies.ps1** script.

Create Teams app setup policies

As an admin, you can use app setup policies to do the following:

- Customize Teams to highlight the apps that are most important for your users. You choose the apps to pin and set the order in which they appear. Pinning apps lets you showcase apps that users in your organization need, including those built by third parties or by developers in your organization.
- Control whether users can pin apps to Teams.

Apps are pinned to the app bar. This is the bar on the side of the Teams desktop client and at the bottom of the Teams mobile clients (iOS and Android).

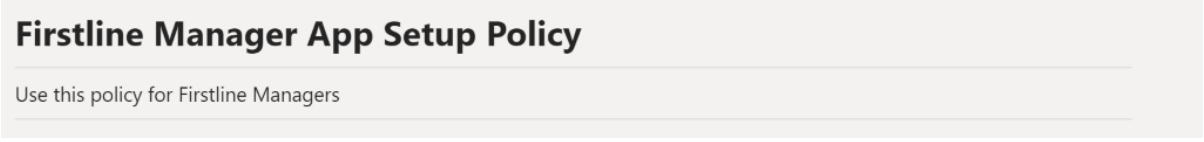
TEAMS DESKTOP CLIENT		TEAMS MOBILE CLIENT
		

Best Practice Discussion: You manage app setup policies in the Microsoft Teams admin center. They aren't able to be created with PowerShell. You can use the global (Org-wide default) policy or create custom policies and assign them to users. Users in your organization will automatically be assigned to the global policy unless you create and assign a custom policy. For our purposes, we are creating two new policies for Firstline Workers and Firstline Managers, in order to provide them a simpler and more streamlined experience to ease onboarding a large number of users simultaneously. You can choose to customize the experience as your business needs.

Create the Firstline Manager app setup policy

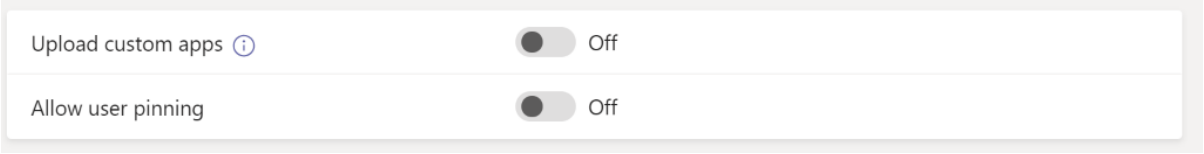
The following settings can be customized to meet your business needs. We have chosen some recommended options based on best practices and to improve the ease of onboarding new users at scale. For more information, click here.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**.
2. Click **Add**.
3. Enter a name and description for the policy. As an example: **Firstline Manager App Setup Policy**.

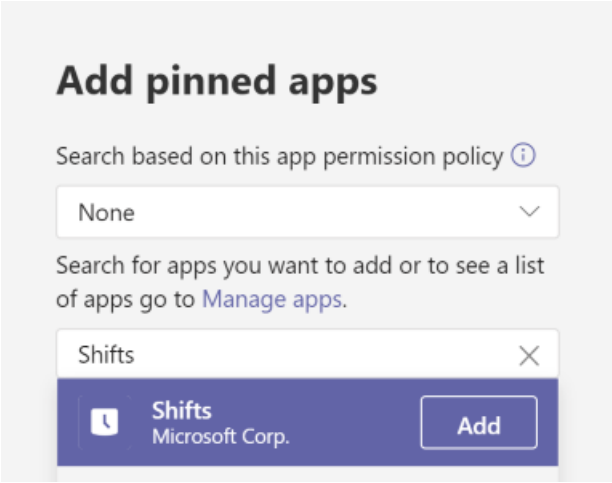


4. Turn off **Upload custom apps**.

5. Turn off **Allow user pinning**.



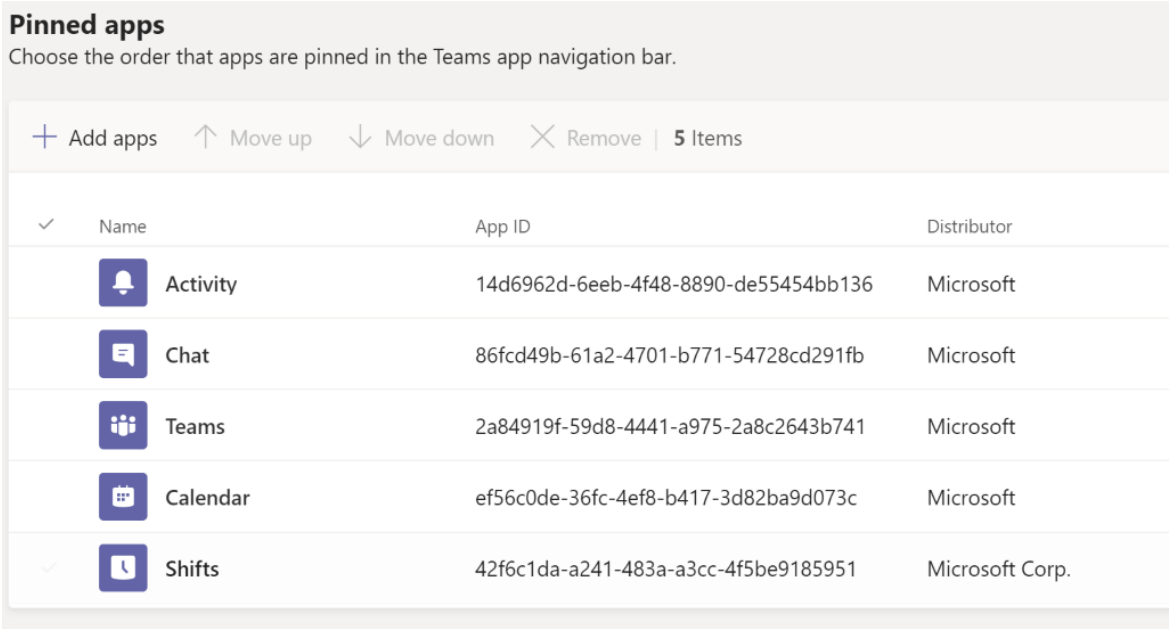
6. If it's not already listed, add the **Shifts** app. For more information about **Shifts**, click here.



7. Remove Calling, if it appears. Note: removing this feature will not disable it for the user, but will prevent it from appearing on the app bar to simplify the end user experience.

8. Arrange the apps in the following order to dictate their order in the Teams App Bar, and then click **Save**.

    a. Activity
    b. Chat
    c. Teams
    d. Calendar
    e. Shifts

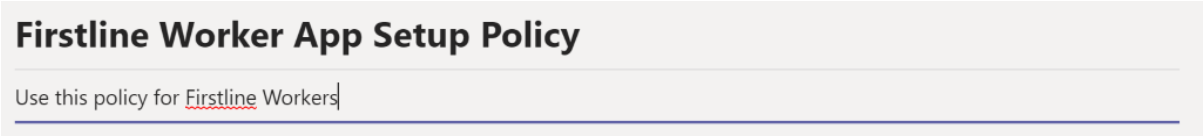


Create the Firstline Worker app setup policy

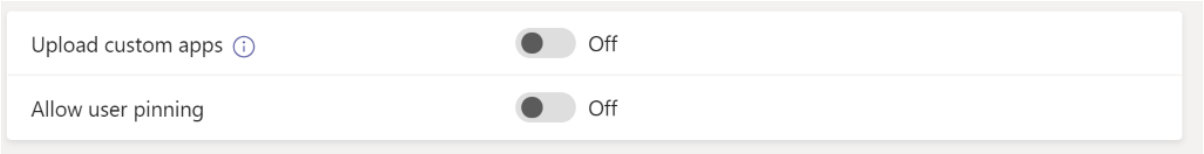
The following settings can be customized to meet your business needs. We have chosen some recommended options based on best practices and to improve the ease of onboarding new users at scale. For more information, click here.

1. In the left navigation of the Microsoft Teams admin center, go to **Teams apps** > **Setup policies**.

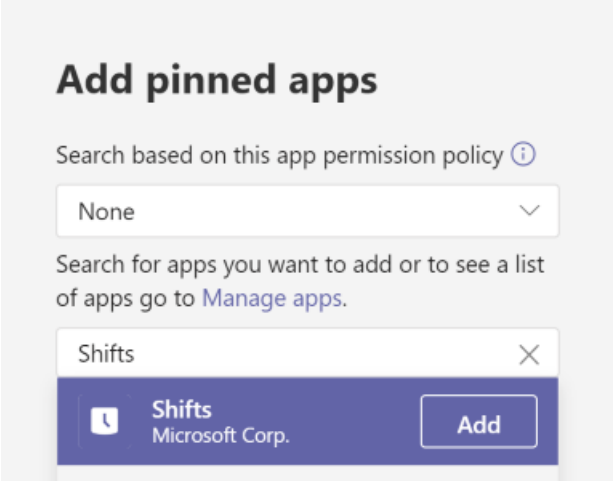
2. Click **Add**.
3. Enter a name and description for the policy. As an example: **Firstline Worker App Setup Policy**.



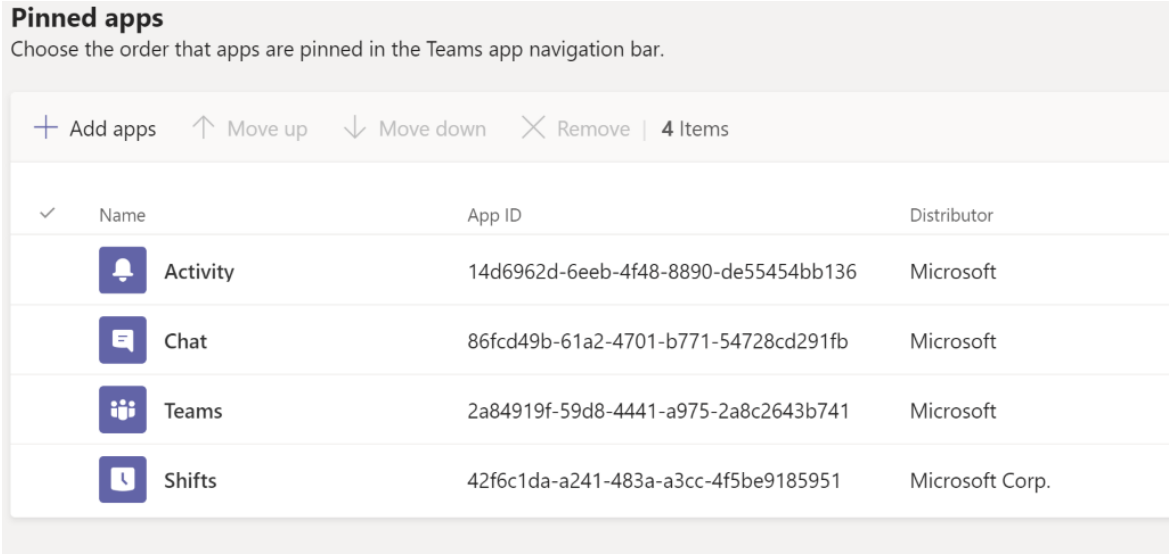
4. Turn off **Upload custom apps**.
5. Turn off **Allow user pinning**.



6. If it's not already listed, add the **Shifts** app. For more information about **Shifts**, click here.



7. Remove Meetings and Calling, if they appear. Note: removing these features will not disable them for the user, but will prevent them from appearing on the app bar to simplify the end user experience.
8. Arrange the apps in the following order to dictate their order in the Teams App Bar, and then click **Save**.
    a. Activity
    b. Chat
    c. Teams
    d. Shifts



Create Teams app permission policies

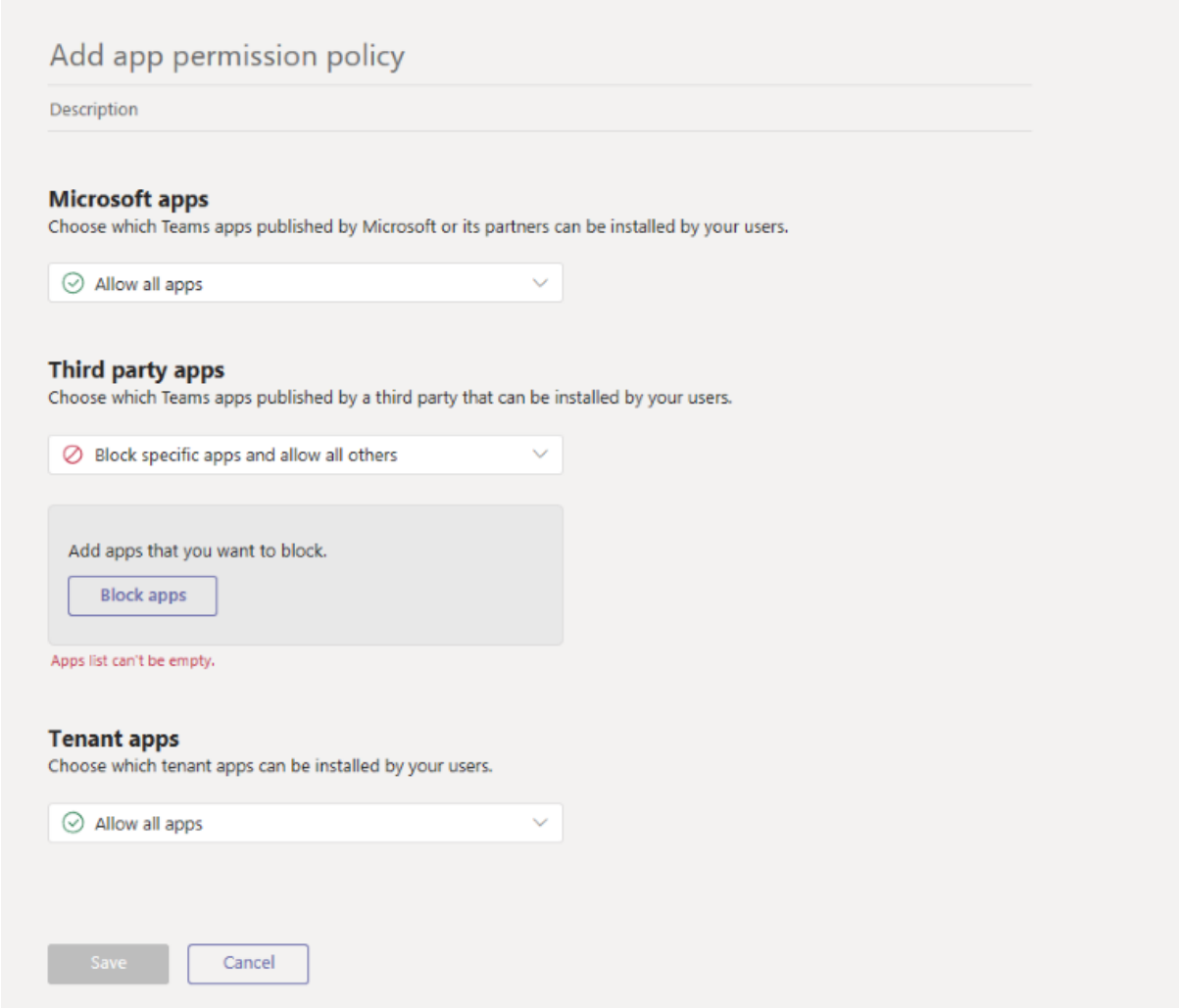
As an admin, you can use app permission policies to control what apps are available to Microsoft Teams users in your organization. You can allow or block all apps, or specific apps published by Microsoft, third-parties, and your organization. When you block an app, users who have the policy are unable to install it from the Teams app store. You must be a global admin or Teams service admin to manage these policies.

Best Practice Discussion: You manage app setup policies in the Microsoft Teams admin center. They aren't able to be created with PowerShell. You can use the global (Org-wide default) policy or create custom policies and assign them to users. Users in your organization will automatically get the global policy unless you create and assign a custom policy. For our purposes, we are creating two new policies for Firstline Workers and Firstline Managers in order to provide a secure and more streamlined experience to ease onboarding a large number of users simultaneously. You can of course choose to customize the experience as your business needs.

Create the Firstline Manager app permission policy

The following settings can be customized to meet your business needs. These are some recommended options based on best practices that can improve the ease of onboarding new users at scale. For more information, click here.

1. In the left navigation of the Microsoft Teams admin center, go to**Teams apps**>**Permission policies**.
2. Click**Add**.

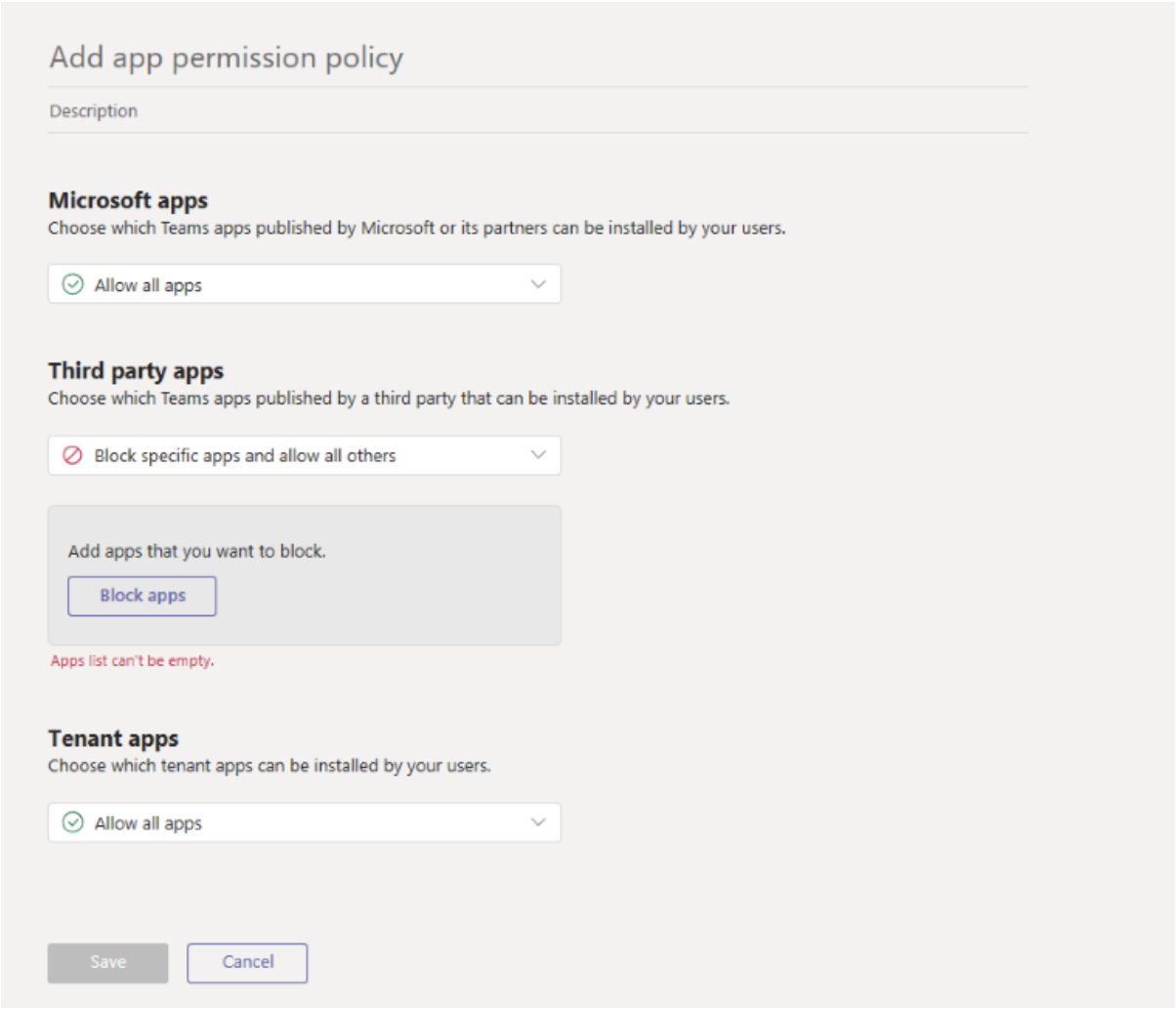


3. Enter a name and description for the policy. As an example: Firstline Manager App Permission Policy.
4. UnderMicrosoft apps, select **Allow all apps**.
5. UnderThird-party apps, select **Allow all apps**.
6. Under Tenant apps, select **Allow all apps**.
7. Click**Save**.

Create the Firstline Worker App Permission Policy

The following settings can be customized to meet your business needs. These are some recommended options based on best practices that can improve the ease of onboarding new users at scale. For more information, click here.

1. In the left navigation of the Microsoft Teams admin center, go to**Teams apps**>**Permission policies**.
2. Click**Add**.



3. Enter a name and description for the policy. As an example: Firstline Worker App Permission Policy.
4. UnderMicrosoft apps, select **Allow all apps**.
5. UnderThird-party apps, select **Block all apps**.
6. Under Tenant apps, select **Allow all apps**.
7. Click**Save**.

Users and security groups

Create users and security groups

To work with a large amount of users in Teams you first need to have the users created in Azure AD. There are many ways to provision a large number of users, but we're going to highlight the following:

- If these users already exist in one of the following HR systems, use the following links to set up user provisioning:
  - SAP Success Factors - Tutorial: Configure SAP SuccessFactors to Active Directory user provisioning.
  - Workday - Tutorial: Configure Workday for automatic user provisioning.

- If you have your user information in other systems, proceed with the following steps.

In order to manage these users at scale more effectively, you need to create two security groups for Firstline Workers and Firstline Managers, and provision those users into the security groups directly, following these steps:

1. Find the **Users.csv** file in the scripts folder in the repository.
2. Update the **Users.csv** file with your organization's specific information.
   a. By default, the script we've provided will create a user with a temporary password that must be changed on first login. If you don't want to use the default password, edit the **CreateUsers.ps1** script to meet your requirements.
   b. Make sure to update the SecurityGroup field to reflect the appropriate name created earlier.
3. Find the **SecurityGroups.csv** file in the scripts folder in the repository.
4. Update the **SecurityGroups.csv** file with your organization's specific security group information.
   a. Make sure to update the **MessagePolicy**, **AppPermissionPolicy**, and **AppSetupPolicy** fields to map to the appropriate policies you created earlier.
   b. Make sure to update the **LicensePlan** field to reflect the licensing that you intend to give each of these users. For more information on product names and service plan identifiers, review the documentation here.
5. From PowerShell, run the script **CreateUsers.ps1** from assets.

Assign licensing to users via group-based licensing

Microsoft paid cloud services, such as Microsoft 365, Office 365, Enterprise Mobility + Security, Dynamics 365, and other similar products, require licenses. These licenses are assigned to each user who needs access to these services. To manage licenses, administrators use one of the management portals (Office or Azure) and PowerShell cmdlets. Azure Active Directory (Azure AD) is the underlying infrastructure that supports identity management for all Microsoft cloud services. Azure AD stores information about license assignment states for users.

In order to enable licensing at scale, Azure AD now includes group-based licensing, and for this reason we created the security groups earlier in this article. You can assign one or more product licenses to a group. Azure AD ensures that the licenses are assigned to all members of the group. Any new members who join the group are assigned the appropriate licenses. Licenses are removed from members who leave the group. This licensing management eliminates the need for automating license management via PowerShell to reflect changes in the organization and departmental structure on a per-user basis.

Assign Users and Policies

Assign users to teams

Now that you've created the users and created the Teams, it's time to put all the users in the appropriate Teams.

1. Find the **Users.csv** file in the data folder in the repository and make sure you have accurate mapping to Teams in this file.
2. From PowerShell, run the script **AssignUserstoTeams.ps1** from the scripts folder in the repository.

Assign Teams policies to users

Now that you've created the users and the policies to modify their experience in Teams, it's time to assign those policies to the correct users.

1. Find the **SecurityGroups.csv** file in the data folder in the repository and make sure you have accurate mapping of the policies to the groups.
2. From PowerShell, run the script **AssignPoliciestoUsers.ps1** from the scripts folder in the repository.

OPTIONAL: Convert group membership type

> **NOTE**
>
> This step is for people who have Azure AD P1 or above.

When licensed for Azure AD P1 or above, you have the option of using Dynamic Group Membership instead of using assigned membership. The scripts that created the Teams also created Office Groups of the membership type Assigned, which means its members must be explicitly added.

Using Dynamic membership, rules are written to determine if someone is a member of the team or not.

> **NOTE**
>
> When you run this script, the current membership of the group will be removed (except for its owners), and new members will be added when the membership synch job runs.

1. Find the **migrateGroups.csv** file in the data folder in the repository.
2. Update the CSV file **migrateGroups.csv** with the groups that will be migrated, along with the rule for dynamic membership.
3. Find the **ConvertGroupMembershipType.ps1** file in the scripts folder in the repository.
4. From PowerShell, run the script **ConvertGroupMembershipType.ps1**

Test and validate

Login to Teams with a test user

Now that you've completed all the steps, it's time to verify the work you've completed.

1. The created user will have an initial password that is in the CreateUsers.ps1 and they are required to change it at their first login.
2. Verify the look and feel of Teams is what you expected. If not, review the **Create Teams Policies** and the **Assign Teams Policies to Users** sections.
3. Verify the user is in the correct team. If not, review the **Create and Setup Users** and **Assign Users to Teams** sections.

> **NOTE**
>
> If Firstline employee provisioning is managed through your Identity and Access Management team, you will need to follow their process for providing the employee their credentials.

Check for errors

As you ran the earlier scripts, errors or exceptions were written to a .csv file located in the logs folder in your copy of the repository. This file can be used to investigate any issues that may have occurred.

An example of an exception could be if you tried to create a team that already existed in your tenant.

1. Find the **Logs** folder and review any .csv file it may contain. If there are no exceptions, you may not find an exception file here.

Error handling

Minimal error handling has been implemented in these sample scripts. There are try/catch blocks and, if triggered, we store the error into a variable in the catch block. Additional error handling must be implemented according to your preferences.

Further reading

- New Team Channel (Powershell)
- New Teams Messaging Policy (Powershell)
- Assign policies to your users in Microsoft Teams
- Assign licenses and user accounts with Office 365 PowerShell

Manage shift-based access for Firstline Workers in Teams

11/2/2020 • 5 minutes to read • Edit Online

IMPORTANT

Effective June 30, 2020, Microsoft StaffHub has been retired. We're building StaffHub capabilities into Microsoft Teams. Today, Teams includes the Shifts app for schedule management and additional capabilities will roll out over time. StaffHub stopped working for all users on June 30, 2020. Anyone who tries to open StaffHub is shown a message directing them to download Teams. To learn more, see Microsoft StaffHub has been retired.

Overview

This is a preview or early release feature.

Presence in Microsoft Teams indicates a user's current availability and status to other users. The presence of Firstline Workers is often less predictable than other staff as their working hours are typically not the same each day. As an admin, you can configure Teams to show a set of shift-based presence states for the Firstline Workers in your organization to indicate when they are on and off shift.

These shift-based presence states—**On shift**, **Off shift**, **Busy**—are separate from the default set of presence states in Teams. With these two sets of presence states, you can configure different experiences for people in your organization based on their role.

With shift-based access, you can manage access to Teams when Firstline Workers are off shift. For example, you can set Teams to display a message that Firstline Workers must acknowledge before they can use Teams when they're not on a scheduled shift.

Scenario

Here's an example of how your organization can manage shift-based access.

You have Firstline Workers in your organization that should only be paid for hours they work on a shift that their manager scheduled and approved. They shouldn't be paid for time spent working outside a scheduled shift, which includes using the Teams app. You set up a custom message that says "Your time on Teams when on off shift won't count toward payable hours", which is displayed when Firstline Workers try to access Teams when off shift. If they choose to use Teams, they click **I accept** with the understanding that they won't be paid for this time.

You also have information workers in your organization who are salaried and who don't work shifts. You configure your information workers to use the default presence states in Teams while giving your Firstline Workers shift-based presence.

Shift-based presence states

Here are the shift-based presence states.

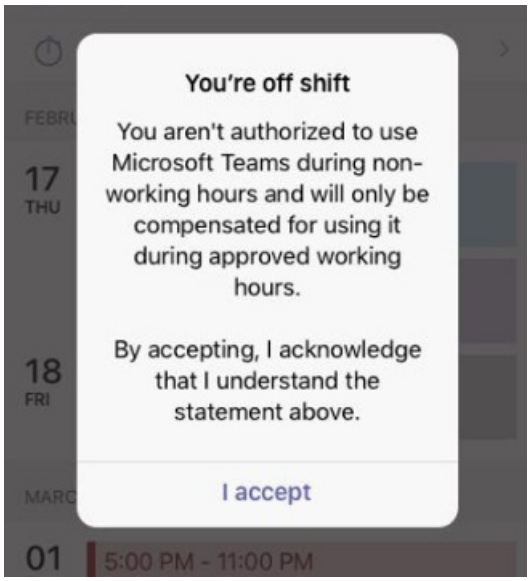
APP CONFIGURED	USER CONFIGURED	MORE INFORMATION
On shift		Automatically set at the start of a shift

APP CONFIGURED	USER CONFIGURED	MORE INFORMATION
Off shift		Automatically set at the end of a shift
Busy	Busy	Automatically set. Can also be manually set when the Firstline Worker is on shift.

Off shift access to Teams

This feature lets you manage access to Teams when Firstline Workers are off shift. You can set Teams to display a message to Firstline Workers if they access Teams when off shift. Firstline Workers must click **I accept** to acknowledge the message before they can use Teams.

You can use the default message, choose from a set of pre-defined messages, or customize the message to display any text that you want. Here's the default message:



You can also set the frequency when the message is displayed and set a grace period between when the first shift starts or last shift ends and when access to Teams is restricted.

Manage shift-based access

As an admin, you use policies to control shift-based presence for Firstline Workers in your organization. You manage these policies by using the following PowerShell cmdlets:

- New-CsTeamsShiftsPolicy
- Get-CsTeamsShiftsPolicy
- Set-CsTeamsShiftsPolicy
- Grant-CsTeamsShiftsPolicy
- Remove-CsTeamsShiftsPolicy

Use the New-CsTeamsShiftsPolicy cmdlet to create a new policy, set the policy settings that you want, and then use the Grant-CsTeamsShiftsPolicy cmdlet to assign the policy to users.

Here's some examples. For detailed information about each policy setting and parameter, including the list of predefined off shift messages that you can choose from, see New-CsTeamsShiftsPolicy.

Example 1

In this example, we create a new policy named Off Shift Teams Access Default Message. In this policy, shift-based presence is turned on and the default message is displayed every time a user who is assigned this policy accesses

Teams when off shift. The user can use Teams when off shift if they accept the message, and the grace period between when the first shift starts or last shift ends and when access is restricted is 10 minutes.

```
New-CsTeamsShiftsPolicy -Identity "Off Shift Teams Access Default Message"-EnableShiftPresence $true -
ShiftNoticeFrequency always -ShiftNoticeMessageType DefaultMessage -AccessType UnrestrictedAccess_TeamsApp -
AccessGracePeriodMinutes 10
```

> **NOTE**
>
> Use the **ShiftNoticeMessageType** parameter to set the message that you want to display. To see a list of the pre-defined messages that you can choose from for this parameter, see New-CsTeamsShiftsPolicy.

Example 2

In this example, we create a new policy named Off Shift Teams Access Custom Message. In this policy, shift-based presence is turned on and a custom message is displayed every time a user who is assigned this policy accesses Teams when off shift. The user can use Teams when off shift if they accept the message, and the grace period between when the first shift starts or last shift ends and when access is restricted is 15 minutes.

```
New-CsTeamsShiftsPolicy -Identity "Off Shift Teams Access Custom Message" -EnableShiftPresence $true -
ShiftNoticeFrequency always -ShiftNoticeMessageType CustomMessage -ShiftNoticeMessageCustom "Your time on Teams
when on off shift won't count toward payable hours" -AccessType UnrestrictedAccess_TeamsApp -
AccessGracePeriodMinutes 15
```

> **NOTE**
>
> Use the **ShiftNoticeMessageType** parameter to set the message that you want to display. To learn more, see New-CsTeamsShiftsPolicy.

Example 3

In this example, we create a new policy named Off Shift Teams Access Message1. In this policy, shift-based presence is turned on and the following predefined message is displayed every time a user who is assigned this policy accesses Teams when off shift.

"Your employer does not authorize or approve of the use of its network, applications, systems, or tools by non-exempt or hourly employees during their non-working hours. By accepting, you acknowledge that your use of Teams while off shift is not authorized and you will not be compensated."

The user can use Teams when off shift if they accept the message, and the grace period between when the first shift starts or last shift ends and when access is restricted is three minutes.

```
New-CsTeamsShiftsPolicy -Identity "Off Shift Teams Access Message1"-EnableShiftPresence $true -
ShiftNoticeFrequency always -ShiftNoticeMessageType Message1 -AccessType  UnrestrictedAccess_TeamsApp -
AccessGracePeriodMinutes 3
```

> **NOTE**
>
> Use the **ShiftNoticeMessageType** parameter to set the message that you want to display. To see a list of the pre-defined messages that you can choose from for this parameter, see New-CsTeamsShiftsPolicy.

Example 4

In this example, we assign a policy named Off Shift Teams Access Custom Message to a user named

remy@contoso.com.

```
Grant-CsTeamsShiftsPolicy -Identity remy@contoso.com-PolicyName "Off Shift Teams Access Custom Message"
```

Related topics

- Manage the Shifts app for your organization in Teams
- Teams PowerShell overview

Microsoft Teams for RealWear

9/24/2020 • 2 minutes to read • Edit Online

This article covers the Microsoft Teams client for RealWear head-mounted wearables. FirstLine Workers using RealWear HMT-1 and HMT-1Z1 can now collaborate with a remote expert using video calling on Teams. Through a voice-controlled user interface, Teams for RealWear allows field workers to remain 100% hands-free while maintaining situational awareness in loud and hazardous environments. By showing what they see in real-time, field workers can accelerate the time to resolve issues and reduce the risk of an expensive downtime.

How to deploy Microsoft Teams for RealWear

- RealWear devices updated to release 11.2 or above. More information here.
- Access to RealWear Foresight for distributing the Microsoft Teams client for Realwear.

Required Licenses

Microsoft Teams licenses are part of Microsoft 365 and Office 365 subscriptions. No additional licensing is required to use Teams for RealWear. For more information about getting Teams, check outHow do I get access to Microsoft Teams.

Managing RealWear devices

Microsoft Endpoint Manager

RealWear devices can be managed using Android Device Administrator mode. Support for management via Android Enterprise is limited, as the devices currently don't have Google Mobile Services (GMS) available.

- To learn more about managing RealWear devices on Microsoft Endpoint Manager, see Android device administrator enrollment in Intune.
- For more details on policies, see How to use Intune in environments without Google Mobile Services.

Third-party Enterprise Mobility Managers (EMMs)

For guidance on third-party EMMs, see Supported Enterprise Mobility Management Providers.

End-user content

For further reading on this from an end-user perspective, please check out Using Microsoft Teams for RealWear.

Walkie Talkie app in Microsoft Teams

9/24/2020 • 3 minutes to read • Edit Online

The Walkie Talkie app in Teams provides instant push-to-talk (PTT) communication for your team and is now available on Android. Walkie Talkie allows users to connect with their team using the same underlying channels they're members of. Only users who connect to Walkie Talkie in a channel become participants and can communicate with each other using push-to-talk, one at a time.

With Walkie Talkie in Teams, firstline workers can now securely communicate with a familiar PTT experience without needing to carry bulky radios, and Walkie Talkie works anywhere with WiFi or cellular internet connectivity.

Getting started

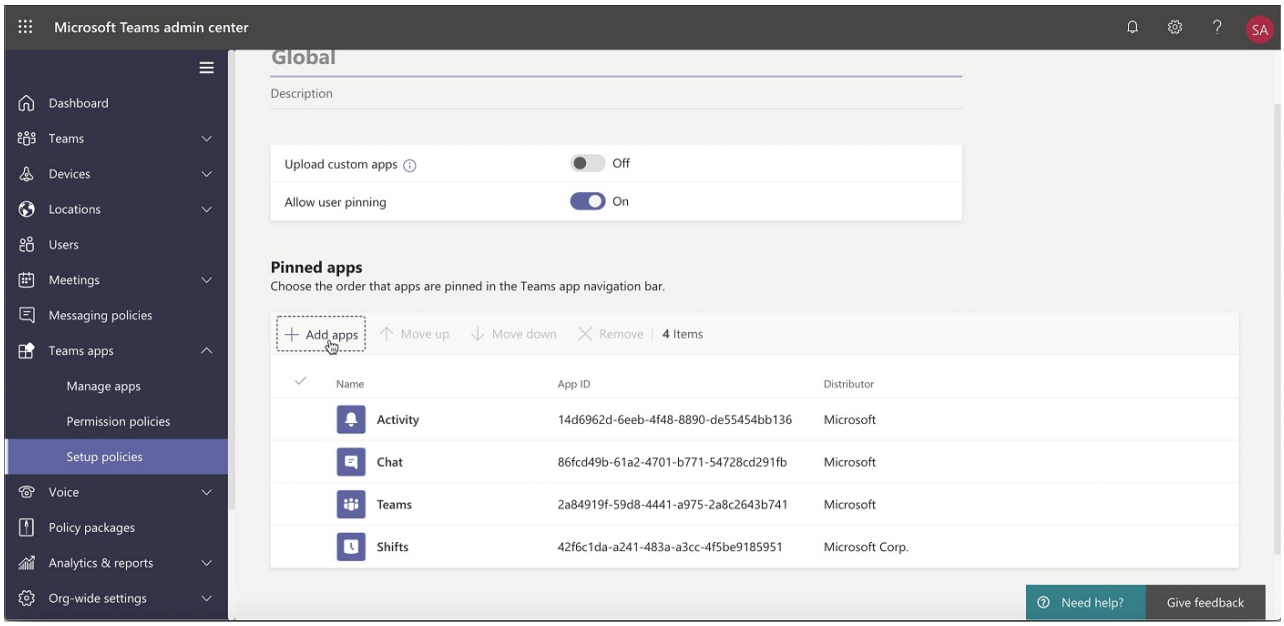
Deploying Walkie Talkie

Currently, Walkie Talkie is not pre-installed. To enable this feature for users in your organization, you need to add Walkie Talkie to theApp Setup Policyassigned to users from the Teams Admin Center.

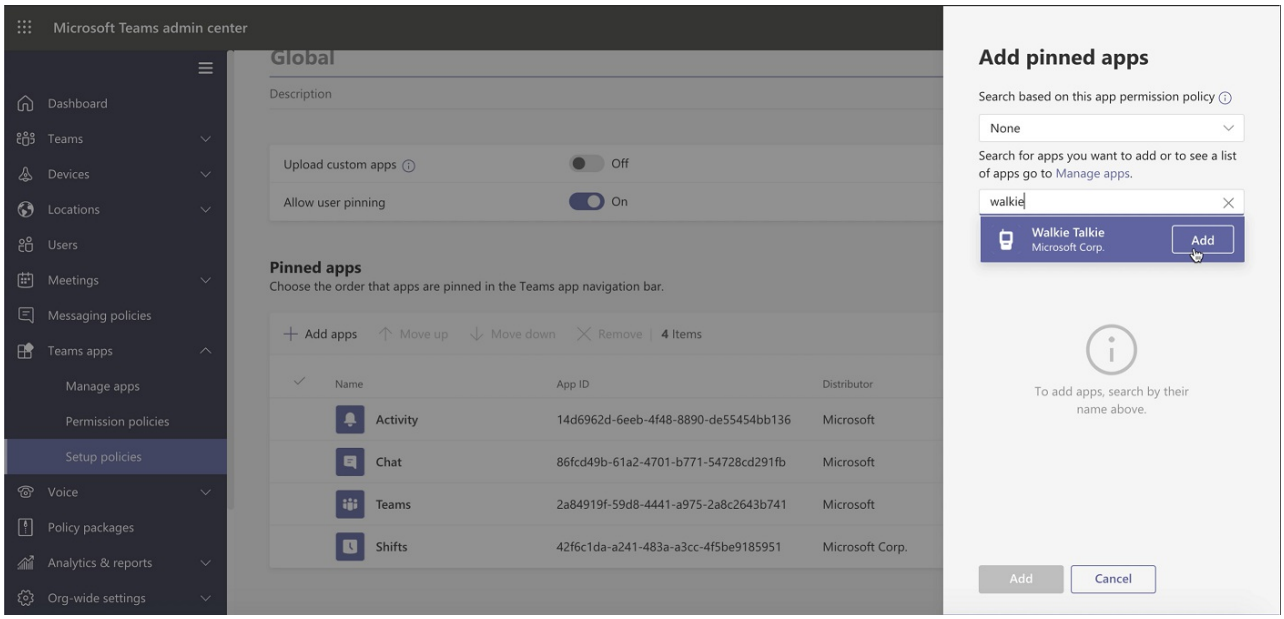
Once enabled, Walkie Talkie will become available on the Android app within 48 hours.

Adding Walkie Talkie to your app list

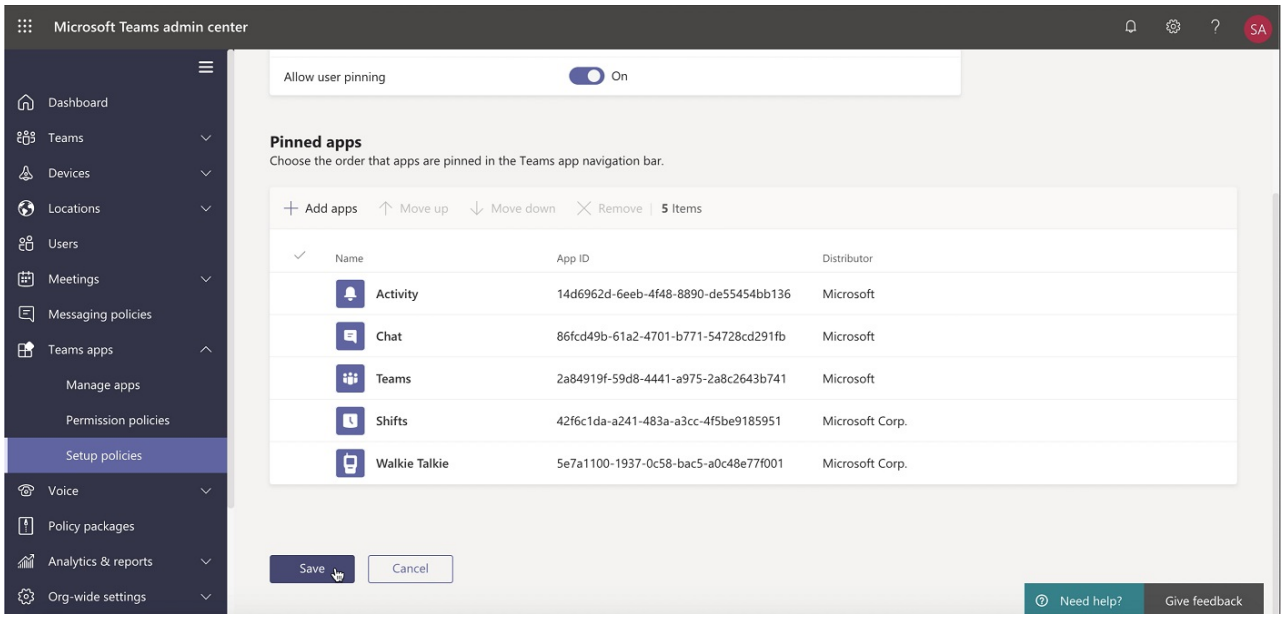
In the Microsoft Teams admin center, under **Teams app** > **Setup policies**, you should have **Allow user pinning** set to **On**. Then, under the Pinned Apps section, click **+Add Apps**.



On the **Add pinned apps** panel that appears on the right, use the **Search** textbox to look for Walkie Talkie. When you have it as a search result, click the **Add** button to the right of the name to add it to your list.



The Walkie Talkie app should now appear on the Pinned Apps list, and be available for use once you click the **Save** button.



Network documentation

Walkie Talkie in Teams requires Internet connectivity and below the network conditions are required for optimal experience.

METRIC	REQUIRED
Latency (RTT)	< 300ms
Jitter	< 30ms
Packet Loss	< 1%

As noted above, the quality of real-time media over an IP network is greatly impacted by the quality of the network connectivity, but especially by the amount of:

- **Latency** - This is the time it takes to get an IP packet from point A to point B on the network. This network propagation delay is essentially tied to physical distance between the two points and the speed of light, including additional overhead taken by the various routers in between. Latency is measured as Round-trip Time

(RTT).

- **Packet Loss** - This is often defined as a percentage of packets that are lost in a given window of time. Packet loss directly affects audio quality—from small, individual lost packets having almost no impact, to back-to-back burst losses that cause complete audio cut-out.
- **Jitter** - This is the average change in delay between successive packets.

Expected data usage from Walkie Talkie is around 20KB/s when sending or receiving audio. When idle, expected data usage from Walkie Talkie is negligible.

Walkie Talkie devices

FirstLine workers often need to speak and receive Walkie Talkie calls even when their phones are locked. This experience is possible through specialized devices with a dedicated PTT button.

- Headsets
  - Wired headsets (Klein Electronics)
  - Wireless headsets (Jabra BlueParrott)
- Rugged phones
  - Samsung Galaxy XCover Pro
    - More info.
    - Setup guide.

> **NOTE**
> These devices are not Teams certified. They have been validated to work with Teams Walkie Talkie.

License requirements

Walkie Talkie app is included in all paid licenses of Teams in Office 365 subscriptions. For more information about getting Teams, check outHow do I get access to Microsoft Teams?

> **NOTE**
> Certain advanced features may require additional licensing. For example, integration with Samsung Galaxy XCover Pro requires a Knox license.

Further information

- ITAdmins can maintain control over who is using Walkie Talkie through App Policies.
- If your firstline worker is using mobile data to communicate via Teams, Walkie Talkie will use the same method.
- Walkie Talkie should work well in low bandwidth situations, or situations where your smartphone is connected and working. Walkie Talkie will not work when there is no connectivity at all.

For further reading on the end-user experience, see:

- Get started with Teams Walkie Talkie
- Communicate with your team with Walkie Talkie

Create a Teams 'Intranet Portal app' from a SharePoint Online site or page

7/8/2020 • 3 minutes to read • Edit Online

Use the steps in this article to create a standalone and static app inside of Teams that links to the intranet site for your org.

A *Teams Personal App* of your SharePoint intranet site is created, and will appear as a tab inside of Teams. This tab can contain information important to all your Teams users. It is a quick and convenient way for Teams users to access updates just a tab click away.

Be aware that the process shown **must use** a *modern* SharePoint site or page to work. This process is not available for *classical* sites or pages.

> **IMPORTANT**
> Make certain that side-loading of Teams apps is enabled for your tenant. Depending on where you are in the migration process of the Teams Admin portal, you might need to enable it either under Teams > Admin, or under Admin > Settings > Services and Add-ins > Microsoft Teams > Apps > External Apps, in the previous version of the portal!

Use App Studio to create your standalone SharePoint Online app

Before you begin:

1. You'll need to know the URL of a SharePoint Online modern Communication or Team site, or page.
   - These sites will always have either */teams/* or */sites/* in their paths.
2. You'll need to know your tenant's subdomain, which will be used in the placeholder **{{subdomain}}**.
3. This article will use **{{siteUrl}}** as a placeholder for the *URL* of the site or page you chose.
   - Example *URLs*: https://contoso.sharepoint.com/teams/Contoso *or* https://contoso.sharepoint.com/sites/Contoso
4. Also, **{{sitePath}}** will be used to denote the *path* of the URL (ex: /teams/Contoso).
   - Example *paths*: /teams/Contoso *or* /sites/Contoso

Begin by following the steps below:

1. Go to the Teams Store.
2. Install or open App Studio.
3. Click **Open**, next to the App option.
4. With App Studio open, click on **Manifest Editor**.
5. **Create a new app**.
6. Fill in all **App Details**.
7. Click on **Tabs** under Capabilities.
8. Click **Add** under Personal Tab.

9. Fill in the **Name** and choose **a new unique Entity ID**.
10. Fill in the **contentURL and Website URL**.

- **contentUrl**: {{siteUrl}}/_layouts/15/teamslogon.aspx?SPFX=true&dest={{sitePath}}
- **websiteUrl**: {{siteUrl}}

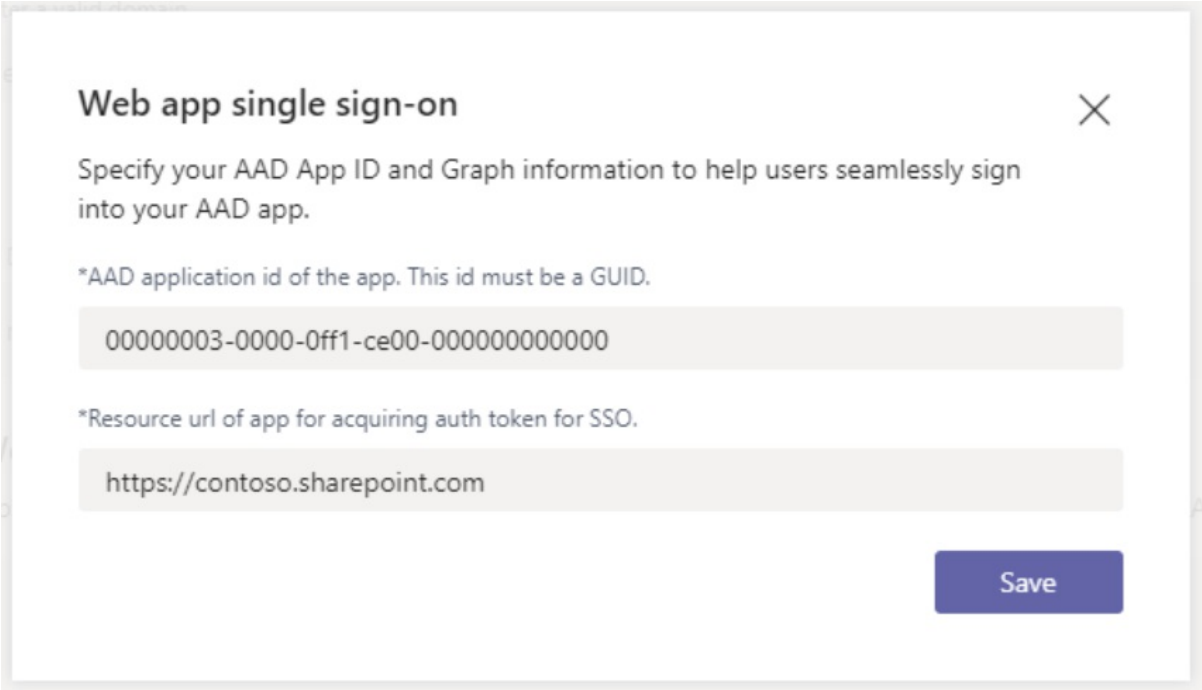
  Example **contentURL**: https://contoso.sharepoint.com/sites/ContosoHub/_layouts/15/teamslogon.aspx?SPFX=true&dest=/sites/ContosoHub

11. Navigate to **Domains and Permissions**. Make sure the valid domains section contains your SharePoint online domain name.

    Example: contoso.sharepoint.com

12. Add the following web app **single sign-on** properties:

    Example: **AAD application ID**: 00000003-0000-0ff1-ce00-000000000000 **Resource Url**: {{subdomain}}.sharepoint.com



13. **Save** these properties and then navigate to **Test and distribute**.
14. Install the app to test the application personally.

> **IMPORTANT**
> If you aren't using Teams App Studio, you will have to .zip the manifest.JSON file you just created, navigate to the App Store in Teams, and click **upload custom app** link (at the bottom right of the App Store). This will make the app available to you.

15. Now the app is available as a static tab for you to load and view in Teams.

Test and view your new static tab

To view the new tab on the Teams desktop, navigate to the ellipses (...) in the left-hand side of your app bar. Find your new app, load it, and test your standalone application in Teams.

If you want to make the new app available in the left menu at a higher position, you must use an app policy setting for this. This setting can be found under the Team admin section > app policy > add a pinned application. When

you assign the policy to a user for testing, the change will appear a few hours later. With this in mind, please decide where the app should appear at your earliest convenience to help avoid delays.

To view and test the new app on a mobile device, open the app drawer by tapping on the chevron (^) above the tab bar near the bottom of your screen. Find your app and navigate to it on your mobile device.

Caution

Mobile support is currently in Developer Preview. To enable Developer Preview, navigate to Settings > About and then enable Developer Preview mode.

A Sample Manifest.JSON file

The JSON file you generate will look something like the one below.

```
{

"$schema":"https://developer.microsoft.com/en-us/json-schemas/teams/v1.5/MicrosoftTeams.schema.json",

"manifestVersion":"1.5",

"version":"1.0.0",

"id":"33ebded3-931c-4333-b0c5-b51dd8738873",

"packageName":"com.contoso.teams.devapp",

"developer":{

"name":"Contoso", ''

"websiteUrl":"https://www.contoso.com",

"privacyUrl":"https://www.contoso.com/privacy",

"termsOfUseUrl":"https://www.contoso.com/terms"

},

"icons":{

"color":"color.png",

"outline":"outline.png"

},

"name":{

"short":"ContosoIntranet", '

"full":"IntranetPortalforContoso"

},

"des    ription":{

"short":"IntranetportalforContoso",

"full":"ThisappistodemonstratethecapabilitiesofhostingaSharePointcommunicationandteamsiteasastandaloneappinTeam
s"

},

"accentColor":"#FFFFFF",

"staticTabs":[
```

```
{

           "       nti        Id":       "com    unicat    onSi    eTab",

"name":"ContosoNet",

"contentUrl":"https://contoso.sharepoint.com/sites/ContosoNet/_layouts/15/teamslogon.aspx?
SPFX=true&dest=/sites/ContosoNet/",

"websiteUrl":"https://contoso.sharepoint.com/sites/ContosoNet",

"scopes":[

"personal"

]

},

{

"entityId":"teamSiteTab",

"name":"TeamContoso",

"contentUrl":"https://contoso.sharepoint.com/teams/TeamContoso/_layouts/15/teamslogon.aspx?
SPFX=true&dest=/teams/TeamContoso/",

"websiteUrl":"https://contoso.sharepoint.com/teams/TeamContoso",

"scopes":[

"personal"

]

}

],

"permissions":[

"identity",

"messageTeamMembers"

],

"validDomains":[

"contoso.sharepoint.com"

],

"webApplicationInfo":{

"id":"00000003-0000-0ff1-ce00-000000000000",

"resource":"https://contoso.sharepoint.com"

}

}
```

Teams for Retail

8/5/2020 • 2 minutes to read • Edit Online

Use the admin resources here to manage and get the most out of Teams for your retail stores and workforce.

	Get started with Retail Teams templates

Use Teams retail templates in the admin center

11/2/2020 • 2 minutes to read • Edit Online

Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

Teams templates have pre-built definitions of team structures designed around retailer needs. You can use Teams templates to quickly create the types of teams that work well for retailers and deploy them across your organization. You can also extend the Teams templates to create teams that are tailored to your specific organizational needs.

In this article, we'll introduce each of the Teams templates and how we recommend using them.

This article is for you if you're responsible for planning, deploying, and managing multiple teams across your retail organization. We assume that you already have deployed Teams service in your organization. If you haven't yet rolled out Teams, start by reading the How to roll out Microsoft Teams.

To learn more about team templates in general, refer to Get started with Teams templates.

Organize a store

Bring your retail employees together in one central experience to manage tasks, share documents and resolve customer issues. Integrate additional applications to streamline shift start & end processes.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Organize a store	`retailStore`	Channels: • General • Shift handoff • Learning Apps: • Wiki

Manager Collaboration

The Manager Collaboration template is ideal for creating a team for a set of managers to collaborate across stores/regions, etc. For example, if your organization has regions, you might create a Manager Collaboration team for the California Region and include all the store managers in that region, as well as the regional manager for that region.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Retail - manager collaboration	`retailManagerCollaboration`	Channels: • General • Operations • Learning Apps: • Wiki

Get started with Teams templates in retail

10/12/2020 • 2 minutes to read • Edit Online

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In this article, we'll introduce each of the Teams templates and recommend how to use them.

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To learn more about team templates in general, refer to Get started with Teams templates.

Store template

The Store template is ideal for creating a team to represent an individual retail store location. Using the Store template, you can create a team for each retail store location in your organization.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Retail - Store	`https://graph.microsoft.com/beta/teamsTemplates('retailStore')`	Channels • Shifts handoff* • Learning* *Auto-favorited channels Team properties • Team visibility set to Public Member permissions • Can't create/update/delete channels • Can't add/remove apps • Can't create/update/remove tabs • Can't create/update/remove connectors

Recommended ways to customize the Store template for your organization:

- If your organization has departments within each store, add a channel for each department. Adding a channel facilitates communication and collaboration within the department.
- If your organization has any internal websites (for example, a SharePoint site), consider pinning them as tabs in the relevant team channel. Refer to Get started with Teams templates for instructions.

Manager Collaboration template

The Manager Collaboration template is another one of the Teams templates designed around retailer needs. The Manager Collaboration template is ideal for creating a team for a set of managers to collaborate across stores/regions, and more. For example, if your organization has regions, you might create a Manager Collaboration team for the California Region and include all the store managers in that region, as well as the regional manager for that region.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Retail - Store	`https://graph.microsoft.com/beta/teamsTemplates('retailManagerCollaboration')`	Channels • Operations* • Learning* *Auto-favorited channels Team properties • Team visibility set to Private Member permissions • Can create/update/delete channels • Can add/remove apps • Can create/update/remove tabs • Can create/update/remove connectors

Recommended ways to customize the Manager Collaboration template for your organization:

- If your organization has any internal websites, such as a SharePoint site, that are relevant for managers, consider pinning them as tabs in a relevant team channel. You can take a look at the Microsoft Teams Template documentation for instructions.

How to use first party templates

To use these templates, change the 'template@odata.bind' property in the request body from 'standard' to the TemplateIDs above. For more information on how to deploy Teams templates, see the Microsoft Graph article on how to create a Team.

> **NOTE**
> The channels in the template will automatically be created under the General Tab.

Example: Store template extension script

```
{
  "template@odata.bind": "https://graph.microsoft.com/beta/teamsTemplates('retailStore')",
  "DisplayName": "Contoso Store",
  "Description": "Team for all staff in Contoso Store",
  "Channels": [
    {
      "displayName": "Additional store channel",
      "IsFavoriteByDefault": false
    }
  ]
}
```

Relate topic

Get started with Teams templates in the Admin center

Teams for Government

7/20/2020 • 2 minutes to read • Edit Online

Use these resources to learn about specific considerations for deploying Teams in Microsoft 365 Government environments. When you're ready, follow the same recommended deployment path for Teams as outlined in How to roll out Microsoft Teams.

	Plan for Microsoft 365 Government - GCC deployments
	Plan for Microsoft 365 Government - GCC High
	Plan for Microsoft 365 Government - DOD deployments
	Audio Conferencing with Direct Routing for GCC High and DoD

Support remote government workers using Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

If you're running Microsoft Teams as part of Office 365 for Government, use this guidance to support your remote workforce.

IT Guidance

Learn how to get Teams ready in your organization:

- Make sure everyone has access to Teams with a paid subscription that includes Teams.
- If you already have a subscription, make sure that **Teams is turned on** for everyone.
- For rapid deployment, visit **Teams FastPath PowerPoint** to get Teams rolled out in your organization.
- Understand how to get your organization started with **Meetings in Teams**.

End user communication

Ready to roll out Teams to your users? You can find these great email templates in the **Customer Success Kit for Government**:

- Generate excitement with an **announcement letter** and **countdown template**
- Create weekly touch points with engaging emails:
  - Tease the launch of Teams with a **countdown email**
  - Let users know it's available with an **announcement email**
  - Show users new ways to work together with **Tips and tricks**

End user guidance

Share these assets and videos with your end users to help them get started quickly:

- Download the **Quick Start Guide for Government** to learn the Teams basics.
- Watch the **Short Quick Start Videos** for a walkthrough of Teams and **Meetings Videos** to learn how to use meetings in Teams.

Learn more

- Start your Teams journey with a series of live, **interactive trainings**, designed to get your organization up and running with Teams.
- Join one of our **online classes** to see Teams in action and get your questions answered.
- Share **in-depth training videos** with users who want to learn more.
- Read the **Teams admin documentation** to learn how to roll out and manage Teams.

Use Teams government templates in the admin center

11/2/2020 • 2 minutes to read • Edit Online

Teams templates allow you to quickly and easily create teams by providing a predefined template of settings, channels, and pre-installed apps.

Teams templates have pre-built definitions of team structures designed around governmental needs. You can also extend the Teams templates to create teams that are tailored to your specific organizational needs.

In this article, we introduce each of the Teams templates and recommend how to use them.

This article is for you if you're responsible for planning, deploying, and managing multiple teams across your governmental organization. You've already deployed Teams service in your organization. If you haven't yet rolled out Teams, start by reading the How to roll out Microsoft Teams.

To learn more about team templates in general, refer to Get started with Teams templates.

Coordinate incident response

Centralize communication and critical resources for your crisis management or incident response team. Within this team, you can include many different types of files to help create a central place for all your documents. Use online meetings to improve information flow and situational awareness.

BASE TEMPLATE TYPE	BASETEMPLATEID	PROPERTIES THAT COME WITH THIS BASE TEMPLATE
Coordinate incident response	`com.microsoft.teams.template.CoordinateIncidentResponse`	Channels: • General • Announcements • Logistics • Planning • Recovery • Urgent Apps: • Wiki • Excel • OneNote • SharePoint • Planner

Manage the Office 365 G1 Trial for US government

8/6/2020 • 2 minutes to read • Edit Online

As of July 1, 2020, the Office 365 E1 Trial license is no longer available. If you need to license users for Microsoft Teams, read the Microsoft Teams service description for a list of paid subscriptions that include Teams.

Use the guidance in this article to manage your existing Office 365 G1 Trial licenses, including upgrading to a paid subscription. To learn more, read Microsoft 365 Government Plans and the Microsoft Teams capabilities available in the GCC Cloud.

Don't miss all of our guidance for supporting remote workers with Teams.

Manage the G1 Trial

Once you've activated the Office 365 G1 Trial, turn on the license for any uses who need it. To learn how, read Manage user access to Teams.

Once you've turned on the G1 Trial for the users who need it, you'll manage these users just like you manage users who have a paid license. For more information, see Manage Teams settings for your organization.

Upgrade users from the Office 365 G1 Trial license

To upgrade G1 Trial users to a paid subscription:

1. Purchase a subscription that includes Teams.
2. Remove the Office 365 G1 Trial subscription from the user.
3. Assign the newly purchased license.

For more information, see Teams for Government.

> **NOTE**
> If the G1 Trial license ends and a user is not immediately upgraded to a subscription that includes Teams, the user data is not removed. The user still exists in Azure Active Directory and all data within Teams still remains. Once a new license is assigned to the user to enable Teams functionality again, all content will still exist.

Remove an Office 365 G1 Trial license

- If you would like to remove this license by using PowerShell, see: Remove licenses from user accounts with Office 365 PowerShell
- If you would like to remove this license through the admin portal, see: Delete a user from your organization

Related topics

Manage user access to Teams

Manage Teams settings for your organization

Plan for Microsoft 365 Government - GCC deployments

12/5/2020 • 4 minutes to read • Edit Online

This guidance is for IT pros who are driving deployments of Microsoft 365 in US federal, state, local, tribal, or territorial government entities or other entities that handle data that's subject to government regulations and requirements, where the use of Microsoft 365 Government - GCC is appropriate to meet these requirements. New March 26, 2020: Don't miss our downloadable Quick Start guide for GCC.

IMPORTANT

Microsoft Teams is experiencing a tremendous spike in online calls and audio/video conferencing due to the coronavirus (COVID-19) pandemic.

In response to the unprecedented increase in calls, and to ensure continuity and availability, Microsoft is allowing Microsoft Teams GCC audio/video servers to leverage processing capacity in our commercial datacenters, as well as in our government datacenters.

These audio/video servers reside within the Microsoft Azure FedRAMP High accreditation boundary servers in the United States and do not store any customer content. However, these servers are processing audio and video for calls and conferences and are operating under our commercial staff during this interim period.

Qualified, screened personnel are monitoring these servers for potential access to customer data by reviewing any interactive log-ons to these servers. Qualified personnel meet GCC requirements for access to customer content. For details about screening requirements, see the GCC service description.

Thank you for your support as we take steps to ensure that our services remain available and reliable in these extraordinary times.

NOTE

If your organization has already met the Microsoft 365 Government - GCC eligibility requirements and applied for and been accepted into the program, you can skip steps 1 and 2 and go directly to step 3.

Step 1. Determine whether your organization needs Microsoft 365 Government - GCC and meets eligibility requirements.

The Microsoft 365 Government - GCC environment provides compliance with US government requirements for cloud services, including FedRAMP Moderate, and requirements for criminal justice and federal tax information systems (CJI and FTI data types).

In addition to enjoying the features and capabilities of Microsoft 365, organizations benefit from the following features that are unique to Microsoft 365 Government - GCC:

- Your organization's customer content is logically segregated from customer content in the commercial Microsoft 365 services from Microsoft.
- Your organization's customer content is stored within the United States.
- Access to your organization's customer content is restricted to screened Microsoft personnel.
- Microsoft 365 Government - GCC complies with certifications and accreditations that are required for US Public Sector customers.

You can find more information about the Microsoft 365 Government - GCC offering for US Government customers at Microsoft 365 Government plans, including eligibility requirements.

The Microsoft 365 US Government service description describes the platform's benefits, which are centered around meeting compliance requirements within the United States.

> **TIP**
> You might want to transfer the tables of information in the service description into an Excel workbook and add two columns: **Relevant for my organization Y/N** and **Meets the needs of my organization Y/N**. Then you can review this list with your colleagues to confirm that this service meets your organization's needs.

Decision points	• Decide whether Microsoft 365 Government - GCC is appropriate for your organization. • Confirm that your organization meets eligibility requirements.

> **NOTE**
> Microsoft 365 Government - GCC is only available in the United States. Non–US Government customers can choose from a number of Microsoft 365 Government plans.

Step 2. Apply for Microsoft 365 Government - GCC

Having decided that this service is right for your organization, start the process of applying for this service here.

Step 3. Understand Microsoft 365 Government - GCC default security settings.

We recommend that you take time to carefully review your admin and security settings before you modify them, and consider impacts on compliance before you make any changes to the default security settings.

Decision point	• Decide whether you'll modify any of the default Microsoft 365 Government - GCC security settings, resolving to first understand the impact of any changes you might make.

Step 4. Understand which capabilities are currently unavailable or disabled by default.

To accommodate the requirements of our government cloud customers, there are some differences between Microsoft 365 Government - GCC and Enterprise plans. Refer to the following table to see which features are available.

Microsoft Teams service description

> **NOTE**
> Once other workloads are fully available in the GCC cloud, then they will become available in Teams when all additional integration work is completed.

 Decision point	• Decide whether the Teams feature set meets your organization's needs.

Step 5. Plan for governance

Determine your requirements for governance and how you can meet them. Go to Plan for governance in Teams for more information.

 Decision point	• Determine and document your governance requirements, following the guidelines in Plan for governance in Teams.

Step 6. Deploy Teams for collaboration

After you've been onboarded to Microsoft 365 Government – GCC, follow the recommended deployment path outlined in How to roll out Microsoft Teams. Be sure to engage with your Adoption and Change Management team and Teams champions.

You can also work with FastTrack or your chosen partner to onboard the service.

Step 7. Deploy Teams for meetings and voice

This is also a great time to use Teams with your wider stakeholder group to start planning for rolling out meetings and cloud voice features.

Plan for Office 365 Government - GCC High deployments

8/6/2020 • 3 minutes to read • Edit Online

This guidance is for IT pros who are driving deployments of Office 365 in US federal government entities or other entities that handle data that's subject to government regulations and requirements, where the use of Office 365 Government – GCC High is appropriate to meet these requirements.

> **NOTE**
> If your organization has already met the Office 365 Government – GCC High eligibility requirements and applied for and been accepted into the program, you can skip steps 1 and 2 and go directly to step 3.

Step 1. Determine whether your organization needs Office 365 Government - GCC High and meets eligibility requirements.

The Office 365 Government - GCC High environment provides compliance with US government requirements for cloud services. In addition to enjoying the features and capabilities of Office 365, organizations benefit from the following features that are unique to Office 365 Government – GCC High:

- Your organization's customer content is logically segregated from customer content in the commercial Office 365 services from Microsoft.
- Your organization's customer content is stored within the United States.
- Access to your organization's customer content is restricted to screened Microsoft personnel.
- Office 365 Government – GCC High complies with certifications and accreditations that are required for US Public Sector customers.

You can find more information about the Office 365 Government – GCC High offering for US Government customers at Office 365 Government plans, including eligibility requirements.

The Office 365 US Government service description describes the platform's benefits, which are centered on meeting compliance requirements within the United States.

> **TIP**
> You might want to transfer the tables of information in the service description into an Excel workbook and add two columns: **Relevant for my organization Y/N** and **Meets the needs of my organization Y/N**. Then you can review this list with your colleagues to confirm that this service meets your organization's needs.

Decision points	• Decide whether Office 365 Government - GCC High is appropriate for your organization. • Confirm that your organization meets eligibility requirements.

NOTE

Office 365 Government - GCC High is only available in the United States. Non–US Government customers can choose from a number of Office 365 Government plans.

Step 2. Apply for Office 365 Government - GCC High

Having decided that this service is right for your organization, start the process of applying for this service.

Step 3. Understand Office 365 Government - GCC High default security settings.

We recommend that you take time to carefully review your admin and security settings before you modify them, and consider impacts on compliance before you make any changes to the default security settings.

Decision point	• Decide whether you'll need to modify any of the default Office 365 Government - GCC High security settings, resolving to first understand the impact of any changes you might make.

Step 4. Understand which Teams capabilities are currently available in Office 365 Government - GCC High

To accommodate the requirements of our government cloud customers, there are some differences between Teams in Office 365 Government - GCC High and Teams in the Enterprise plans. Refer to the following table to see which features are available.

Microsoft Teams service description

Step 5. Plan for governance

Determine your requirements for governance and how you can meet them. Go to Plan for governance in Teams for more information.

	Decision point	• Determine and document your governance requirements, following the guidelines in Plan for governance in Teams.

Step 6. Deploy Teams for collaboration

After you've been onboarded to Office 365 Government – GCC High, follow the recommended deployment path outlined in How to roll out Microsoft Teams. Be sure to engage with your Adoption and Change Management team and Teams champions.

You can also work with FastTrack or your chosen partner to onboard the service.

Plan for Office 365 Government - DoD deployments

8/6/2020 • 3 minutes to read • Edit Online

This guidance is for IT pros who are driving deployments of Office 365 in US federal government entities or other entities that handle data that's subject to government regulations and requirements, where the use of Office 365 Government – DoD is appropriate to meet these requirements.

> **NOTE**
> If your organization has already met the Office 365 Government – DoD eligibility requirements and applied for and been accepted into the program, you can skip steps 1 and 2 and go directly to step 3.

Step 1. Determine whether your organization needs Office 365 Government - DoD and meets eligibility requirements.

The Office 365 Government - DoD environment provides compliance with US government requirements for cloud services. In addition to enjoying the features and capabilities of Office 365, organizations benefit from the following features that are unique to Office 365 Government – DoD:

- Your organization's customer content is logically segregated from customer content in the commercial Office 365 services from Microsoft.
- Your organization's customer content is stored within the United States.
- Access to your organization's customer content is restricted to screened Microsoft personnel.
- Office 365 Government – DoD complies with certifications and accreditations that are required for US Public Sector customers.

You can find more information about the Office 365 Government – DoD offering for US Government customers at Office 365 Government plans, including eligibility requirements.

The Office 365 US Government service description describes the platform's benefits, which are centered on meeting compliance requirements within the United States.

> **TIP**
> You might want to transfer the tables of information in the service description into an Excel workbook and add two columns: **Relevant for my organization Y/N** and **Meets the needs of my organization Y/N**. Then you can review this list with your colleagues to confirm that this service meets your organization's needs.

Decision points	• Decide whether Office 365 Government - DoD is appropriate for your organization. • Confirm that your organization meets eligibility requirements.

NOTE

Office 365 Government - DoD is only available in the United States. Non–US Government customers can choose from a number of Office 365 Government plans.

Step 2. Apply for Office 365 Government - DoD

Having decided that this service is right for your organization, start the process of applying for this service.

Step 3. Understand Office 365 Government - DoD default security settings.

We recommend that you take time to carefully review your admin and security settings before you modify them, and consider impacts on compliance before you make any changes to the default security settings.

Decision point	• Decide whether you'll need to modify any of the default Office 365 Government - DoD security settings, resolving to first understand the impact of any changes you might make.

Step 4. Understand which Teams capabilities are currently available in Office 365 Government - DoD

To accommodate the requirements of our government cloud customers, there are some differences between Teams in Office 365 Government - DoD and Teams in the Enterprise plans. Refer to the following table to see which features are available.

Microsoft Teams service description

Step 5. Plan for governance

Determine your requirements for governance and how you can meet them. Go to Plan for governance in Teams for more information.

	Decision point	• Determine and document your governance requirements, following the guidelines in Plan for governance in Teams.

Step 6. Deploy Teams for collaboration

After you've been onboarded to Office 365 Government – DoD, follow the recommended deployment path outlined in How to roll out Microsoft Teams. Be sure to engage with your Adoption and Change Management team and Teams champions.

You can also work with FastTrack or your chosen partner to onboard the service.

Audio Conferencing with Direct Routing for GCC High and DoD

9/24/2020 • 8 minutes to read • Edit Online

Audio Conferencing with Direct Routing for GCC High and DoD enables participants to join Teams meetings in your GCC High or DoD organization by using a phone device. Meeting participants might prefer to use a phone device to join Teams meetings in scenarios such as when internet connectivity is limited or when users are on the road and don't have access to Teams. Participants can choose to join meetings by either dialing in to a dial-in phone number for your organization or by having the meeting dial out to their phone device.

With Audio Conferencing with Direct Routing for GCC High and DoD, your organization uses its own numbers as dial-in phone numbers and all meeting dial-outs to phone devices are routed via Direct Routing. To enable the service, organizations need to set up Direct Routing and configure phone numbers that can be used as dial-in phone numbers. The requirement to use Direct Routing is different from the Audio Conferencing service that's offered to non-GCC High and non-DoD organizations where the dial-in phone numbers are provided by Microsoft.

Deploy Audio Conferencing with Direct Routing for GCC High and DoD

Step 1: Get Audio Conferencing with Direct Routing for GCC High or DoD licenses

To use Audio Conferencing in GCC High or DoD, your organization and the users in your organization need to have an Audio Conferencing with Direct Routing license assigned. Here are the licenses you need to enable Audio Conferencing with Direct Routing for GCC High or DoD.

- GCC High: An Audio Conferencing - GCC High Tenant license for your organization and Audio Conferencing - GCC High licenses for your users.
- DoD: An Audio Conferencing - DoD Tenant license for your organization and Audio Conferencing - DoD licenses for your users.

A tenant license and at least one user license are required to enable the service. You can't enable the service with only the tenant license or with only user licenses. To get service licenses for your tenant and the users in your organization, contact your account team.

> **IMPORTANT**
> Users can't be enabled for Audio Conferencing with Direct Routing until dial-in phone numbers are set up. We recommend that you not assign Audio Conferencing with Direct Routing for GCC High or DoD licenses to users until you set up dial-in phone numbers as outlined in this article.

Step 2: Set up Direct Routing

To set up Direct Routing, see the following articles:

- Plan Direct Routing
- Configure Direct Routing

> **NOTE**
>
> When you set up Direct Routing, remember to use the GCC High or DoD-specific FQDNs and ports that are described in these two articles.

Step 3: Set up dial-in phone numbers

Dial-in phone numbers are the phone numbers that are associated to your Audio Conferencing bridge. These numbers are used by participants to join meetings scheduled by users in your organization. These numbers are also included in the meeting invites of the users who schedule meetings in your organization and on the "Find a local number" page.

Define service phone numbers in your tenant

You can use the New-csHybridTelephoneNumber PowerShell cmdlet to define service phone numbers in your tenant that can be used to route calls to the Audio Conferencing service via Direct Routing.

```
New-csHybridTelephoneNumber -TelephoneNumber <Phone number in E.164 format>
```

For example:

```
New-csHybridTelephoneNumber -TelephoneNumber "+14250000000"
```

Assign the service phone numbers to the Audio Conferencing bridge of your organization

You can assign service phone numbers to the Audio Conferencing bridge of your organization by using the Register-csOnlineDialInConferencingServiceNumber PowerShell cmdlet.

```
Register-csOnlineDialInConferencingServiceNumber -identity <Telephone number in E.164 format> -BridgeId
<Identity of the audio conferencing bridge>
```

You can see the ID of your Audio Conferencing Bridge using Get-CsOnlineDialInConferencingBridge. For example:

```
$b= Get-CsOnlineDialInConferencingBridge
Register-csOnlineDialInConferencingServiceNumber -identity 14257048060 -BridgeId $b.identity
```

Step 4: Define a global voice routing policy to enable the routing of outbound calls from meetings

The routing of outbound calls that are made to the PSTN from meetings organized by users in your organization is defined by the global voice routing policy of your organization. If your organization has a global voice routing policy defined, please verify that the global voice routing policy allows the outbound calls to the PSTN that are expected to be initiated from meetings organized by users in your organization. If your organization doesn't have a global voice routing policy defined, you will need to define one to enable the routing of outbound calls to the PSTN from meetings organized by users in your organization. Please note that the global voice routing policy of your organization also applies to one-to-one calls made to the PSTN by users in your organization. If one-to-one calls to the PSTN are enabled for users in your organization, make sure that the global voice routing policy meets the needs of your organization for both types of calls.

> **NOTE**
>
> Location-Based Routing isn't available in Microsoft 365 Government Community Cloud (GCC) High or DoD deployments. When enabling Audio Conferencing, please verify that no Audio Conferencing users in the GCC High or the DoD environments are enabled for Location-Based Routing.

Defining a global voice routing policy

A global voice routing policy can be defined by defining a PSTN usage, a voice route, a voice routing policy, and assigning the new voice routing policy as the global voice routing policy of your organization.

The following steps describe how to define a new global voice routing policy for an organization without one. If your organization already has voice routing policies defined, verify that the following configuration doesn't conflict with the existing voice routing policies of your organization.

To create a new PSTN usage in a remote PowerShell session in Skype for Business Online, use the following command:

```
Set-CsOnlinePstnUsage -Identity Global -Usage @{Add="International"}
```

For additional information, see Set-CsOnlinePstnUsage.

To create a new voice route, use the following command:

```
New-CsOnlineVoiceRoute -Identity "International" -NumberPattern ".*" -OnlinePstnGatewayList sbc1.contoso.biz -
OnlinePstnUsages "International"
```

When defining a new voice route for your organization, please specify one or multiple of the PSTN online PSTN gateways that have been defined for your organization during the configuration of Direct Routing.

The number pattern specifies which calls will be routed through the specified list of gateways based on the destination phone number of the call. In the example above, calls to any destinations in the world will match the voice route. If you would like to restrict the phone numbers that can be dialed from the meetings of users in your organization, you can change the number pattern to have the voice route match only the number patterns of the destinations allowed. Please note that if there are no voice routes that match the number pattern of the destination phone number of a given call, the call will not be routed.

For additional information, see New-CsOnlineVoiceRoute.

To create a new voice routing policy, use the following command:

```
New-CsOnlineVoiceRoutingPolicy "InternationalVoiceRoutingPolicy" -OnlinePstnUsages "International"
```

If multiple PSTN usages are being defined in the voice routing policy, they will be evaluated in the order in which they are defined. It is recommended that the PSTN usages are defined in the order of the most specific to the more generic in terms of the number patterns of the voice routes associated with the PSTN usages. For example, if a PSTN usage was defined to route calls to the United States, and another PSTN usage was defined to route calls to any other location in the world, the PSTN usage for calls to the United States should be listed in the voice routing policy ahead of the PSTN usage to route calls to any other location in the world.

For additional information, see New-CsOnlineVoiceRoutingPolicy.

To assign the new voice route to the global voice routing policy of your organization, use the following command:

```
Grant-CsOnlineVoiceRoutingPolicy -PolicyName "InternationalVoiceRoutingPolicy" -Global
```

For additional information, see Grant-CsOnlineVoiceRoutingPolicy.

Once the global voice routing policy has been defined, any outbound calls made from meetings organized by users in your organization will be evaluated against the voice routes associated to the PSTN usages of the global voice routing policy. The outbound calls will be routed according to the first voice route that matches the number pattern of the dialed phone number.

Step 5: Assign Audio Conferencing with Direct Routing for GCC High or DoD licenses to your users

To assign Audio Conferencing with Direct Routing for GCC High or DoD licenses to your user, see Assign licenses to users.

Step 6: (Optional) See a list of Audio Conferencing numbers in Teams

To see the list of Audio Conferencing numbers of your organization, go to See a list of Audio Conferencing numbers in Microsoft Teams.

Step 7: (Optional) Set auto attendant languages for the Audio Conferencing dial-in numbers of you organization

To change the languages of the Audio Conferencing dial-in numbers of your organization, see Set auto attendant languages for Audio Conferencing in Microsoft Teams.

Step 8: (Optional) Change the settings of the Audio Conferencing bridge of your organization

To change the settings of the Audio Conferencing bridge of your organization, see Change the settings for an Audio Conferencing bridge.

Step 9: (Optional) Set the phone numbers included in the meeting invites of the users in your organization

To change the set of phone numbers that are included in the meeting invites of the users is your organization, see Set the phone numbers included on invites in Microsoft Teams.

Audio Conferencing capabilities not supported in Audio Conferencing with Direct Routing for GCC High and DoD

The following are Audio Conferencing capabilities that are not supported in Audio Conferencing with Direct Routing for GCC High and DoD:

- Entry and exit notifications using name recording. For Audio Conferencing with Direct Routing, entry and exit notifications are played in the meeting as tones.
- Outbound calling restriction policies for Audio Conferencing. User-level controls to restrict outbound calls aren't applicable to meeting dial-out calls routed via Direct Routing.
- Disable the usage of toll-free numbers for the meetings specific organizer. User-level controls to restrict the usage of toll-free numbers to join the meetings of your organization aren't applicable to calls routed via Direct Routing.
- Sending notification emails to users when their settings change. Audio Conferencing notification emails aren't supported for Audio Conferencing with Direct Routing for GCC High and DoD.

Teams policy packages for government

12/5/2020 • 3 minutes to read • Edit Online

> **NOTE**
> Policy packages are currently not available in Microsoft 365 Government GCC High or DoD deployments.

Overview

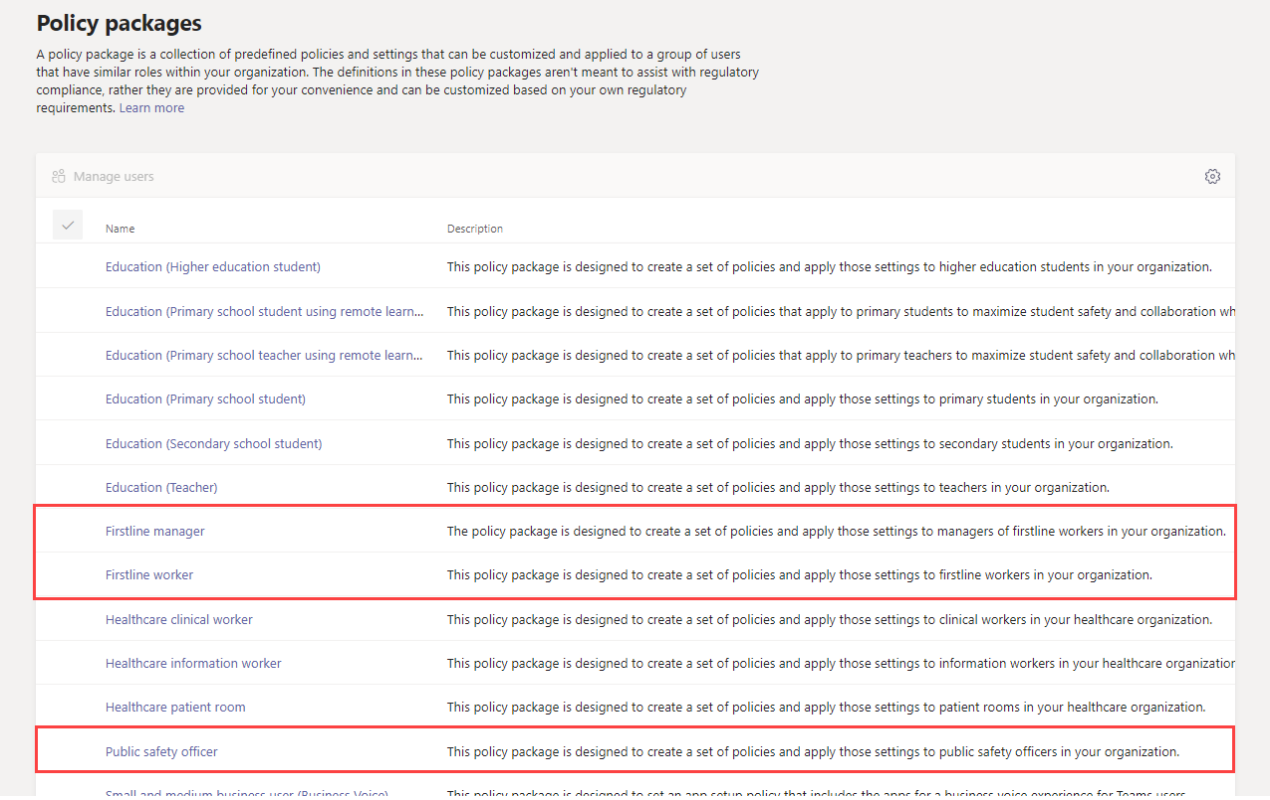
A policy package in Microsoft Teams is a collection of predefined policies and policy settings that you can assign to users who have similar roles in your organization. Policy packages simplify, streamline, and help provide consistency when managing policies. You can customize the settings of the policies in the package to suit the needs of your users. When you change the settings of policies in a policy package, all users who are assigned to that package get the updated settings. You can manage policy packages by using the Microsoft Teams admin center or PowerShell.

Policy packages pre-define policies for the following, depending on the package:

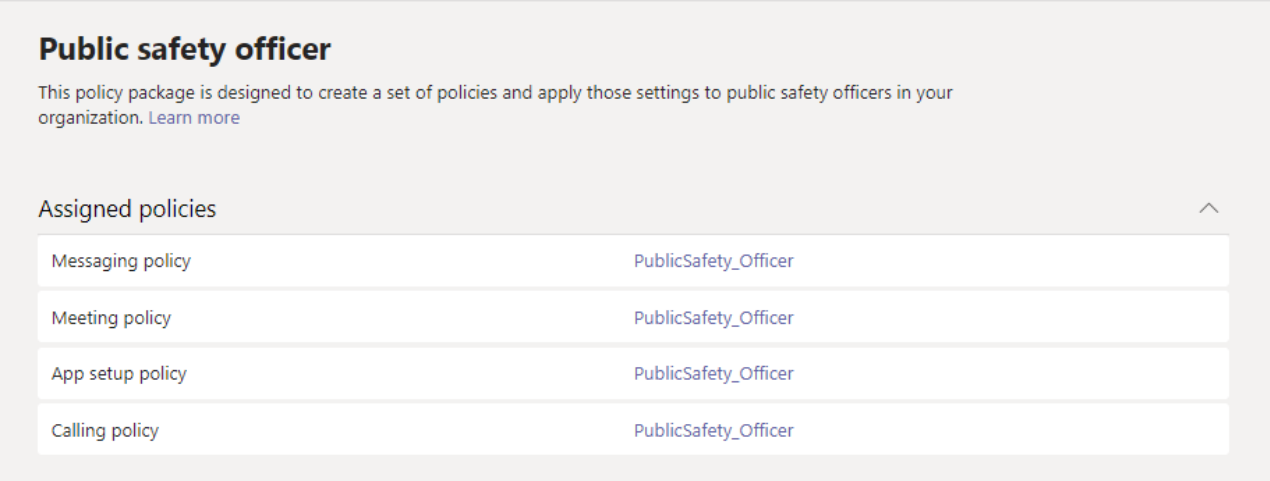
- Messaging
- Meetings
- Calling
- App setup
- Live events

Teams currently includes the following policy packages for government.

PACKAGE NAME IN THE MICROSOFT TEAMS ADMIN CENTER	BEST USED FOR	DESCRIPTION
Public safety officer	Public safety officers in your government organization	Creates a set of policies and policy settings that apply to public safety officers in your organization.
Firstline manager	Firstline Managers in your government organization	Creates a set of policies and applies those settings to Firstline Managers in your organization.
Firstline worker	Firstline Workers in your government organization	Creates a set of policies and applies those settings to Firstline Workers in your organization.



Each individual policy is given the name of the policy package so you can easily identify the policies that are linked to a policy package. For example, when you assign the Public safety officer policy package to users in your organization, a policy named PublicSafety_Officer is created for each policy in the package.



Manage policy packages

View

View the settings of each policy in a policy package before you assign a package. In the left navigation of the Microsoft Teams admin center, select **Policy packages**, select the package name, and then select the policy name.

Decide whether the predefined values are appropriate for your organization or whether you need to customize them to be more restrictive or lenient based on your organization's needs.

Customize

Customize the settings of policies in the policy package, as needed, to fit the needs of your organization. Any changes you make to policy settings are automatically applied to users who are assigned the package. To edit the settings of a policy in a policy package, in the Microsoft Teams admin center, select the policy package, select the name of the policy you want to edit, and then select **Edit**.

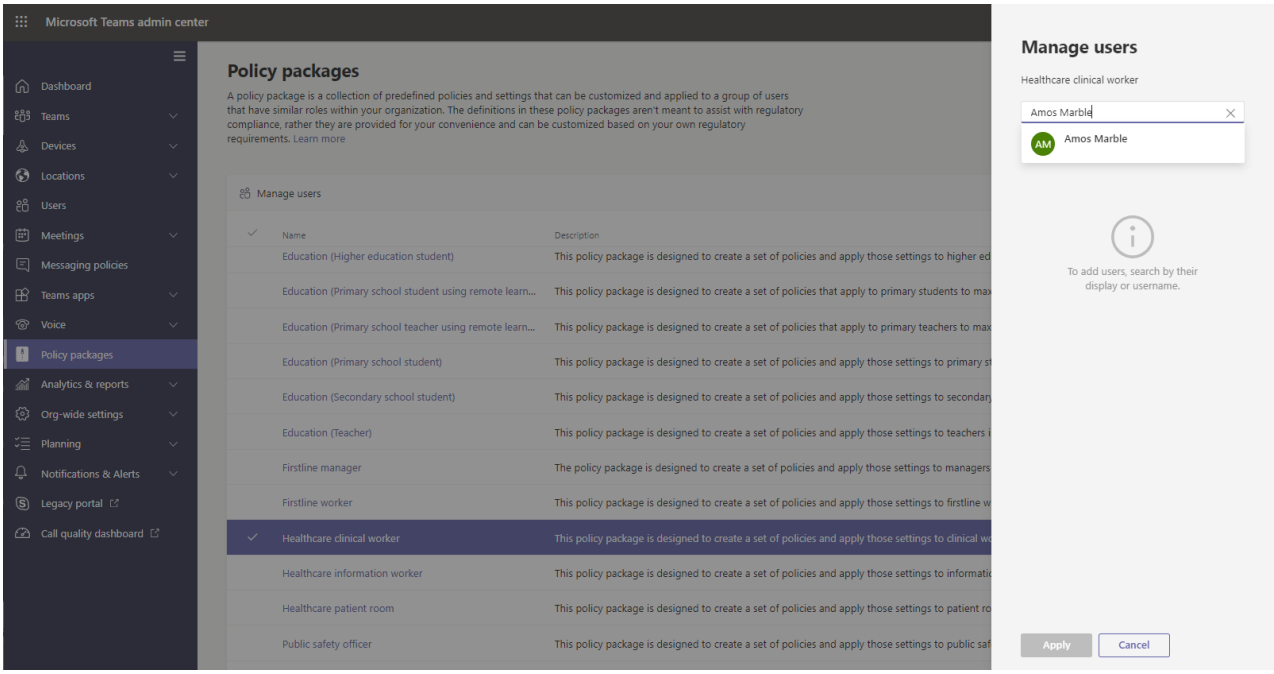
Keep in mind that you can also change the settings of policies in a package after you assign the policy package. To learn more, see Customize policies in a policy package.

Assign

Assign the policy package to users. If a user has a policy assigned, and then later you assign a different policy, the most recent assignment will take priority.

Assign a policy package to one or several users

To assign a policy package to one or multiple users, in the left navigation of the Microsoft Teams admin center, go to **Policy packages**, and then select **Manage users**.



To learn more, see Assign a policy package.

If a user has a policy assigned, and then later you assign a different policy, the most recent assignment will take priority.

Assign a policy package to a group

This feature is in private preview

Policy package assignment to groups let you assign multiple policies to a group of users, such as a security group or distribution list. The policy assignment is propagated to members of the group according to precedence rules. As members are added to or removed from a group, their inherited policy assignments are updated accordingly. This method is recommended for groups of up to 50,000 users but will also work with larger groups.

To learn more, see Assign a policy package to a group.

Assign a policy package to a large set (batch) of users

Use batch policy package assignment to assign a policy package to large sets of users at a time. You use the New-CsBatchPolicyPackageAssignmentOperation cmdlet to submit a batch of users and the policy package that you want to assign. The assignments are processed as a background operation and an operation ID is generated for each batch.

A batch can contain up to 5,000 users. You can specify users by their object Id, UPN, SIP address, or email address. To learn more, see Assign a policy package to a batch of users.

Related topics

Manage policy packages in Teams

Assign policies to your users in Teams

Security and compliance in Microsoft Teams

12/5/2020 • 11 minutes to read • Edit Online

IMPORTANT

To learn how to best ensure **security while everyone's working from home during the COVID-19 outbreak**, read these articles:

- Top 12 tasks for security teams to support working from home
- Optimize Microsoft 365 or Office 365 connectivity for remote users using VPN split tunnelling
- Updated April 2, 2020: Teams security guide

Microsoft Teams is built on the Microsoft 365 and Office 365 hyper-scale, enterprise-grade cloud, delivering the advanced security and compliance capabilities our customers expect. For more information on planning for security in Microsoft 365 or Office 365, the security roadmap is a good place to start. For more information on planning for compliance in Microsoft 365 or Office 365, you can start with the plan for security and compliance article.

This article will provide further information about Teams-specific security and compliance. Don't miss these Microsoft Mechanics videos about security and compliance:

- Microsoft Teams Essentials for IT: Security and Compliance (12:42 min)
- Microsoft Teams Controls for Security and Compliance (10:54 min)

IMPORTANT

As a customer of Microsoft 365 or Office 365, you own and control your data. Microsoft does not use your data for anything other than providing you with the service that you have subscribed to. As a service provider, we do not scan your email, documents, or teams for advertising or for purposes that are not service-related. Microsoft doesn't have access to uploaded content. Like OneDrive and SharePoint in Microsoft 365, customer data stays within the tenant. You can check out more about our trust and security related information at the Microsoft Trust Center. Teams follows the same guidance and principles as the Microsoft Trust Center.

Security

Teams enforces team-wide and organization-wide two-factor authentication, single sign-on through Active Directory, and encryption of data in transit and at rest. Files are stored in SharePoint and are backed by SharePoint encryption. Notes are stored in OneNote and are backed by OneNote encryption. The OneNote data is stored in the team SharePoint site. The Wiki tab can also be used for note taking and its content is also stored within the team SharePoint site.

Read Identity models and authentication for more insight into authentication and Teams, and How modern authentication works will help with modern authentication in particular.

Because Teams works in partnership with SharePoint, OneNote, Exchange, and more, you should be comfortable managing security in Microsoft 365 or Office 365 all-up. To learn more, read about how to configure your Microsoft 365 or Office 365 organization for increased security.

> **NOTE**
>
> Currently, private channels supports limited security and compliance features. Support for the full set of security and compliance features in private channels is coming soon.

Advanced Threat Protection (ATP)

Advanced Threat protection (ATP) is available for Microsoft Teams, along with SharePoint and OneDrive, applications that integrate with Teams for content management. ATP allows you to determine if content in these applications is malicious in nature, and block this content from user access.

How the affected content is managed after detection is up to the settings you've selected in Microsoft 365 or Office 365. We strongly recommend you consider all applications when it comes to configuring ATP, and for further reading, the ATP for SharePoint, OneDrive, and Microsoft Teams article will have detailed information on how to get started.

Safe Links

While, at this time, Advanced Threat Protection (ATP) safe links are not available in Microsoft Teams, they are now in public preview through our Technology Adoption Program (TAP), and while a release date for general availability isn't set, we'll update this article when that time arrives. Meanwhile, for information on Microsoft 365 or Office 365 Safe Links, please review ATP Safe Links. ATP Safe links is available in both ATP Plan 1 and ATP Plan 2.

Safe Attachments

Safe attachments is a feature designed to enhance user security by checking for, and detecting, malicious attachments. Global- or Security Administrators create policies for handling these suspected malicious attachments to prevent them from being sent to users, clicked, and acted upon. Safe attachment protection is available to SharePoint, OneDrive, and Microsoft Teams, and Microsoft 365 or Office 365 Advanced Threat Protection Plan 1 and 2 have this capability. Read more about Safe Attachments and how they can help protect your organization here.

How Conditional Access policies work for Teams

Microsoft Teams relies heavily on Exchange Online, SharePoint, and Skype for Business Online for core productivity scenarios, like meetings, calendars, interop chats, and file sharing. Conditional access policies that are set for these cloud apps apply to Microsoft Teams when a user directly signs in to Microsoft Teams - on any client.

Microsoft Teams is supported separately as a cloud app in Azure Active Directory conditional access policies. Conditional access policies that are set for the Microsoft Teams cloud app apply to Microsoft Teams when a user signs in. However, without the correct policies on other apps like Exchange Online and SharePoint, users may still be able to access those resources directly. For more information about setting up a conditional access policy in the azure portal, go to: Azure Active Directory Quickstart.

Microsoft Teams desktop clients for Windows and Mac support modern authentication. Modern authentication brings sign-in based on the Azure Active Directory Authentication Library (ADAL) to Microsoft Office client applications across platforms.

Microsoft Teams desktop application supports AppLocker. For more information about AppLocker prerequisites, please see: Requirements to use AppLocker.

Compliance

Teams has a wide range of information to help you with compliance areas, including communication compliance for channels, chats, and attachments, retention policies, Data Loss Protection (DLP), eDiscovery and legal hold for channels, chats and files, audit log search, as well as mobile application management with Microsoft Intune. We've provided some information on all these topics below, and you can go to the Microsoft 365 compliance center to manage these settings.

Information Barriers

Information barriers are policies put in-place by Teams administrators to do things like keep people or groups from communicating with one another (when there is no business need for them to do so, or a regulatory reason to block them from doing so), and it also allows you to set policies relating to things like lookups and eDiscovery (covered below). These policies can impact users in 1:1 chats, group chats, or at a team-level.

For further reading on this topic, go to Information barriers in Microsoft Teams.

Communication compliance

Communication compliance in Microsoft 365 allows you to add users to in-scope policies that can be configured to examine Microsoft Teams communications for offensive language, sensitive information, and information related to internal and regulatory standards. Chat communications and associated attachments in both public and private Teams channels, individual chats, and attachments can be scanned to help minimize communication risks in your organization. For more information on how you can configure policies to help you detect, capture, and take action for inappropriate Teams communications, see Communication compliance in Microsoft 365.

Retention Policies

Retention policies in Microsoft Teams allows you to both retain data that's important for your organization to keep, for regulatory, legal, business, or other reasons, and also to remove content and communications that are not relevant to be retained. You can also use retention policies to keep data for a period of time and then delete it. For further information, review the Retention policies in Microsoft Teams article.

Data Loss Prevention (DLP)

Data Loss Prevention (DLP) in Microsoft Teams, as well as the larger DLP story for Microsoft 365 or Office 365, revolves around business readiness when it comes to protecting sensitive documents and data. Whether you have concerns around sensitive information in messages or documents, DLP policies will be able to help ensure your users don't share this sensitive data with the wrong people.

For information on Data Loss Prevention in Teams, please review DLP for Microsoft Teams. A good article for O365 DLP concerns is Overview of data loss prevention.

eDiscovery

Electronic discovery, or eDiscovery, is the electronic aspect of identifying, collecting and producing electronically stored information (ESI) in response to a request for production in a law suit or investigation. Capabilities include case management, preservation, search, analysis, and export of Teams data. This includes chat, messaging and files, meeting and call summaries. For Teams meetings and Calls, a summary of the events that happened in the meeting and call are created and made available in eDiscovery.

For more details about how to do Microsoft 365 or Office 365 eDiscovery in the security center and compliance center and run compliance content search for Teams content, please go to the links below:

eDiscovery

Content Search

We have a Teams-specific article for more information, eDiscovery of guest-to-guest chats.

Customers can leverage eDiscovery or Advanced eDiscovery per their requirements. The following table outlines the differences between the two:

	EDISCOVERY	ADVANCED EDISCOVERY
Case Management	X	X
Access Control	X	X

	EDISCOVERY	ADVANCED EDISCOVERY
Content Searches	X	X
Hold(s)	X	X
Export	X	X
Duplication Detection	-	X
Relevance Searches with Machine Learning	-	X
Unstructured Data Analysis	-	X

Legal Hold

During litigation, you may need all data associated with a user (custodian) or a Team to be preserved as immutable, so that it can be used as evidence for the case. You can do this by placing either a user (user mailbox) or a Team on legal hold. For a team legal hold, the team's mailbox can be put on the following holds:

- In-Place Hold (a subset of the mailbox or site collection through targeted queries or filtered content is put on hold), or
- Litigation Hold (the entire mailbox or site collection is placed on hold).

In either case, once the hold is set it ensures that, even if end users delete or edit channel messages that are in the group mailbox, immutable copies of that content are maintained and available through eDiscovery search. Legal holds are generally applied within the context of an eDiscovery case.

Please see the Overview of retention policies article to understand more about preservation and holds in the Microsoft 365 compliance center. For more Teams-specific information on legal hold, we also have our Place a Microsoft Teams user or team on legal hold article for you to learn more.

Compliance Content Search

Content search can be used to search for all Teams data through rich filtering capabilities. The resulting data can be exported to a specific container for compliance and litigation support. This can be done with or without an eDiscovery case. This enables compliance admins to gather Teams data across all users, review and export it for further processing. Please refer to this Content Search article to learn more about how to conduct a compliance content search for Microsoft Teams and other Microsoft 365 or Office 365 content in the Microsoft 365 compliance center.

> **TIP**
> Using content search, you can filter down to Microsoft Teams only content, such as Chat and Channel Messages, Meetings, and Calls, if necessary.

If you'd like further Teams-specific information on configuring content search, review the Content search in Microsoft Teams article.

Auditing and Reporting

Audit log search plugs right into the Microsoft 365 compliance center and gives you the ability to set alerts, as well as report on audit events, by allowing the export of workload specific or generic event sets for admin use and investigation across an unlimited auditing timeline. You can set up alerts for all audit Log data within the Microsoft 365 compliance center, and filter and export this data for further analysis. Please refer to the Search the audit log

article to learn more about how to conduct an Audit log search for Microsoft 365 or Office 365. To learn more about searching for Microsoft Teams events in the Microsoft 365 compliance center, we also have the Turn on auditing in Teams article for you to review.

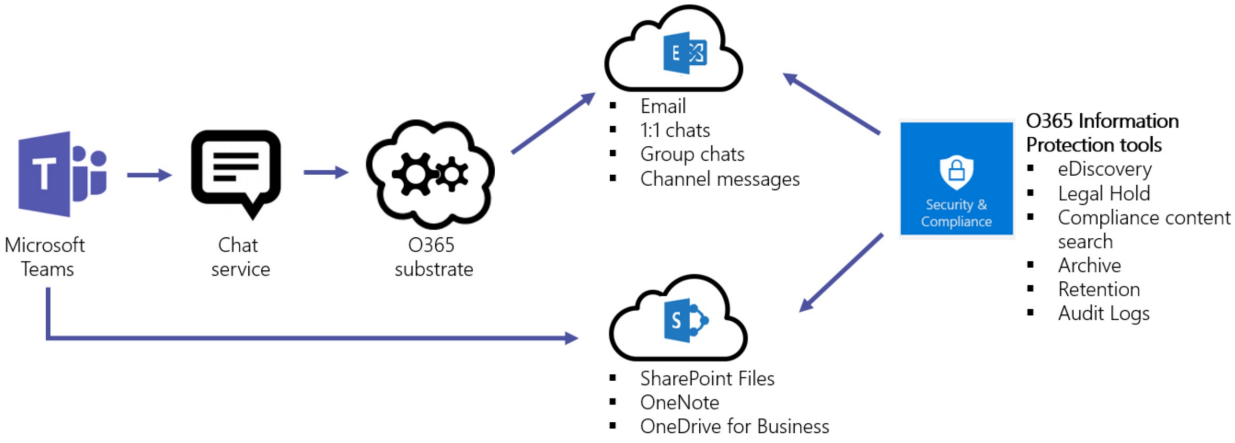
Privacy

At Microsoft, protecting your data is our highest priority. To learn about our privacy practices, read:

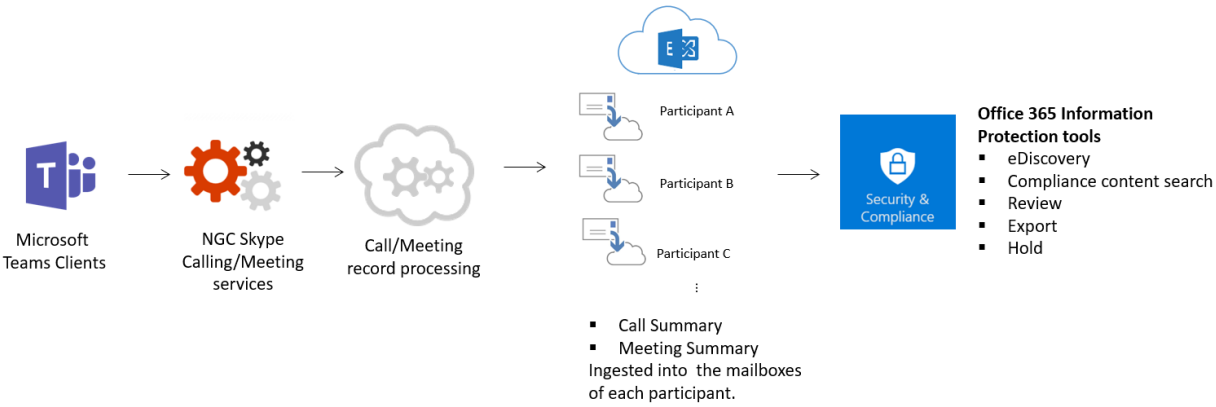
- Privacy at Microsoft
- Our commitment to privacy and security in Microsoft Teams
- For IT professionals: Privacy and security in Microsoft Teams

Information Protection Architecture

The following figure indicates the ingestion flow of Teams data to both Exchange and SharePoint for Teams Files and Messages.



The following figure indicates the ingestion flow of Teams Meetings and calling data to Exchange.



> **IMPORTANT**
> There can be up to a 24-hour delay to discover Teams content.

Licensing

When it comes to information protection capabilities, Microsoft 365 subscriptions, Office 365 subscriptions, and

the associated standalone licenses will determine the available feature set.

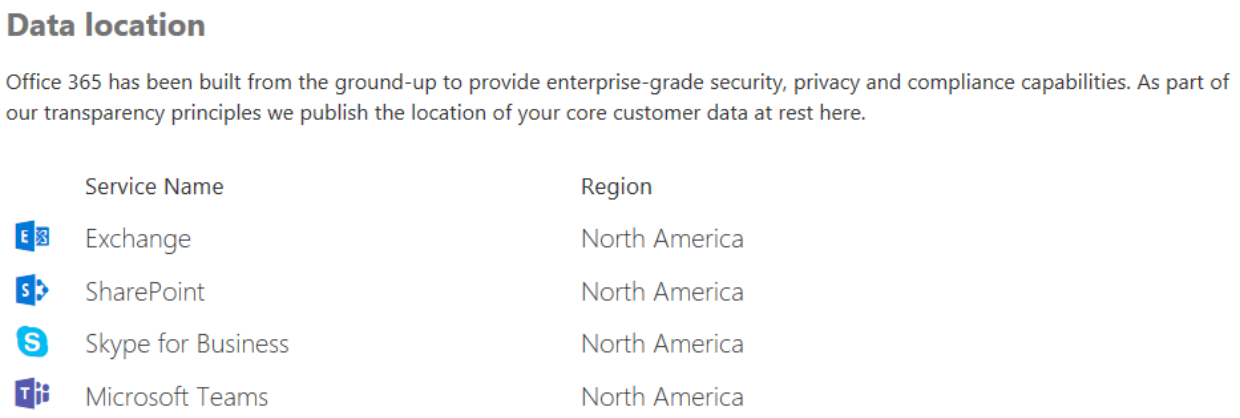
For information on determining the licensing needs to implement features for security and compliance, please review Licensing for Office 365 or Microsoft 365.

> **NOTE**
> Content Search and eDiscovery do not need to be enabled in the Security & Compliance Center to work.

Location of data in Teams

Data in Teams resides in the geographic region associated with your Microsoft 365 or Office 365 organization. To see what regions are supported currently, please review Location of data in Microsoft Teams.

If you need to see which region houses data for your tenant, go to the Microsoft 365 admin center > **Settings** > **Organization profile**. Scroll down to **Data location**.



Compliance standards

Teams uses the following standards: ISO 27001, ISO 27018, SSAE18 SOC 1 and SOC 2, HIPAA, and EU Model Clauses (EUMC). Within the Microsoft compliance framework, Microsoft classifies Microsoft 365 and Office 365 applications and services into four categories. Each category is defined by specific compliance commitments that must be met for a Microsoft 365 or Office 365 service, or a related Microsoft service, to be listed in that category.

Details can be found in the Data Protection Resources. Teams also supports Cloud Security Alliance compliance.

Related topics

Microsoft 365 Security

Microsoft 365 Compliance

Microsoft compliance offerings

Security and Microsoft Teams

12/5/2020 • 20 minutes to read • Edit Online

IMPORTANT

The Teams service model is subject to change in order to improve customer experiences. For example, the default access or refresh token expiration times may be subject to modification in order to improve performance and authentication resiliency for those using Teams. Any such changes would be made with the goal of keeping Teams secure and Trustworthy by Design.

Microsoft Teams, as part of the Microsoft 365 and Office 365 services, follows all the security best practices and procedures such as service-level security through defense-in-depth, customer controls within the service, security hardening and operational best practices. For full details, please see the Microsoft Trust Center.

Trustworthy by Design

Teams is designed and developed in compliance with the Microsoft Trustworthy Computing Security Development Lifecycle (SDL), which is described at Microsoft Security Development Lifecycle (SDL). The first step in creating a more secure unified communications system was to design threat models and test each feature as it was designed. Multiple security-related improvements were built into the coding process and practices. Build-time tools detect buffer overruns and other potential security threats before the code is checked in to the final product. Of course, it is impossible to design against all unknown security threats. No system can guarantee complete security. However, because product development embraced secure design principles from the start, Teams incorporates industry standard security technologies as a fundamental part of its architecture.

Trustworthy by Default

Network communications in Teams are encrypted by default. By requiring all servers to use certificates and by using OAUTH, TLS, Secure Real-Time Transport Protocol (SRTP), all Teams data is protected on the network.

How Teams Handles Common Security Threats

This section identifies the more common threats to the security of the Teams Service and how Microsoft mitigates each threat.

Compromised-Key Attack

Teams uses the PKI features in the Windows Server operating system to protect the key data used for encryption for the Transport Layer Security (TLS) connections. The keys used for media encryptions are exchanged over TLS connections.

Network Denial-of-Service Attack

The denial-of-service attack occurs when the attacker prevents normal network use and function by valid users. By using a denial-of-service attack, the attacker can:

- Send invalid data to applications and services running in the attacked network to disrupt their normal function.
- Send a large amount of traffic, overloading the system until it stops responding or responds slowly to legitimate requests.
- Hide the evidence of the attacks.
- Prevent users from accessing network resources. Teams mitigates against these attacks by running Azure DDOS network protection and by throttling client requests from the same endpoints, subnets, and federated entities.

Eavesdropping

Eavesdropping can occur when an attacker gains access to the data path in a network and has the ability to monitor and read the traffic. This is also called sniffing or snooping. If the traffic is in plain text, the attacker can read the traffic when the attacker gains access to the path. An example is an attack performed by controlling a router on the data path.

Teams uses mutual TLS (MTLS) for server communications within Microsoft 365 and Office 365, and also uses TLS from clients to the service, rendering this attack very difficult or impossible to achieve within the time period in which a given conversation could be attacked. TLS authenticates all parties and encrypts all traffic. This does not prevent eavesdropping, but the attacker cannot read the traffic unless the encryption is broken.

The TURN protocol is used for real time media purposes. The TURN protocol does not mandate the traffic to be encrypted and the information that it is sending is protected by message integrity. Although it is open to eavesdropping, the information it is sending (that is, IP addresses and port) can be extracted directly by simply looking at the source and destination addresses of the packets. The Teams service ensures that the data is valid by checking the Message Integrity of the message using the key derived from a few items including a TURN password, which is never sent in clear text. SRTP is used for media traffic and is also encrypted.

Identity Spoofing (IP Address Spoofing)

Spoofing occurs when the attacker determines and uses an IP address of a network, computer, or network component without being authorized to do so. A successful attack allows the attacker to operate as if the attacker is the entity normally identified by the IP address.

TLS authenticates all parties and encrypts all traffic. Using TLS prevents an attacker from performing IP address spoofing on a specific connection (for example, mutual TLS connections). An attacker could still spoof the address of the DNS server. However, because authentication in Teams is performed with certificates, an attacker would not have a valid certificate required to spoof one of the parties in the communication.

Man-in-the-Middle Attack

A man-in-the-middle attack occurs when an attacker reroutes communication between two users through the attacker's computer without the knowledge of the two communicating users. The attacker can monitor and read the traffic before sending it on to the intended recipient. Each user in the communication unknowingly sends traffic to and receives traffic from the attacker, all while thinking they are communicating only with the intended user. This can happen if an attacker can modify Active Directory Domain Services to add his or her server as a trusted server or modify Domain Name System (DNS) to get clients to connect through the attacker on their way to the server.

Man-in-the-middle attacks on media traffic between two endpoints participating in Teams audio, video, and application sharing, is prevented by using SRTP to encrypt the media stream. Cryptographic keys are negotiated between the two endpoints over a proprietary signaling protocol (Teams Call Signaling protocol) which leverages TLS 1.2 and AES-256 (in GCM mode) encrypted UDP / TCP channel.

RTP Replay Attack

A replay attack occurs when a valid media transmission between two parties is intercepted and retransmitted for malicious purposes. Teams uses SRTP in conjunction with a secure signaling protocol that protects transmissions from replay attacks by enabling the receiver to maintain an index of already received RTP packets and compare each new packet with those already listed in the index.

Spim

Spim is unsolicited commercial instant messages or presence subscription requests, like spam, but in instant message form. While not by itself a compromise of the network, it is annoying in the least, can reduce resource availability and production, and can possibly lead to a compromise of the network. An example of this is users spimming each other by sending requests. Users can block each other to prevent this, but with federation, if a coordinated spim attack is established, this can be difficult to overcome unless you disable federation for the partner.

Viruses and Worms

A virus is a unit of code whose purpose is to reproduce additional, similar code units. To work, a virus needs a host, such as a file, email, or program. Like a virus, a worm is a unit of code that is coded to reproduce additional, similar code units, but that unlike a virus does not need a host. Viruses and worms primarily show up during file transfers between clients or when URLs are sent from other users. If a virus is on your computer, it can, for example, use your identity and send instant messages on your behalf. Standard client security best practices such as periodically scanning for viruses can mitigate this issue.

Security Framework for Teams

This section gives an overview of fundamental elements that form a security framework for Microsoft Teams.

Core elements are:

- Azure Active Directory (Azure AD), which provides a single trusted back-end repository for user accounts. User profile information is stored in Azure AD through the actions of Microsoft Graph.
  - Be advised that there may be multiple tokens issued which you may see if tracing your network traffic. This includes Skype tokens you might see in traces while looking at chat and audio traffic.
- Transport Layer Security (TLS), and mutual TLS (MTLS) which encrypt instant message traffic and enable endpoint authentication. Point-to-point audio, video, and application sharing streams are encrypted and integrity checked using Secure Real-Time Transport Protocol (SRTP). You may also see OAuth traffic in your trace, particularly around negotiating permissions while switching between tabs in Teams, for example to move from Posts to Files. For an example of the OAuth flow for tabs, please see this document.
- Teams uses industry-standard protocols for user authentication, wherever possible.

The next sections discuss some of these core technologies.

Azure Active Directory

Azure Active Directory functions as the directory service for Microsoft 365 and Office 365. It stores all user directory information and policy assignments.

CRL Distribution Points

Microsoft 365 and Office 365 traffic takes place over TLS/HTTPS encrypted channels, meaning that certificates are used for encryption of all traffic. Teams requires all server certificates to contain one or more Certificate Revocation List (CRL) distribution points. CRL distribution points (CDPs) are locations from which CRLs can be downloaded for purposes of verifying that the certificate has not been revoked since the time it was issued and the certificate is still within the validity period. A CRL distribution point is noted in the properties of the certificate as a URL and is secure HTTP. The Teams service checks CRL with every certificate authentication.

Enhanced Key Usage

All components of the Teams service require all server certificates to support Enhanced Key Usage (EKU) for the purpose of server authentication. Configuring the EKU field for server authentication means that the certificate is valid for the purpose of authenticating servers. This EKU is essential for MTLS.

TLS and MTLS for Teams

TLS and MTLS protocols provide encrypted communications and endpoint authentication on the Internet. Teams uses these two protocols to create the network of trusted servers and to ensure that all communications over that network are encrypted. All communications between servers occur over MTLS. Any remaining or legacy SIP communications from client to server occur over TLS.

TLS enables users, through their client software, to authenticate the Teams servers to which they connect. On a TLS connection, the client requests a valid certificate from the server. To be valid, the certificate must have been issued by a Certificate Authority (CA) that is also trusted by the client and the DNS name of the server must match the DNS name on the certificate. If the certificate is valid, the client uses the public key in the certificate to encrypt the symmetric encryption keys to be used for the communication, so only the original owner of the certificate can use

its private key to decrypt the contents of the communication. The resulting connection is trusted and from that point is not challenged by other trusted servers or clients.

Server-to-server connections rely on mutual TLS (MTLS) for mutual authentication. On an MTLS connection, the server originating a message and the server receiving it exchange certificates from a mutually trusted CA. The certificates prove the identity of each server to the other. In the Teams service, this procedure is followed.

TLS and MTLS help prevent both eavesdropping and man-in-the middle attacks. In a man-in-the-middle attack, the attacker reroutes communications between two network entities through the attacker's computer without the knowledge of either party. TLS and Teams' specification of trusted servers mitigate the risk of a man-in-the middle attack partially on the application layer by using encryption that is coordinated using the Public Key cryptography between the two endpoints. An attacker would have to have a valid and trusted certificate with the corresponding private key and issued to the name of the service to which the client is communicating to decrypt the communication.

> **NOTE**
>
> Teams data is encrypted in transit and at rest in Microsoft datacenters. Microsoft uses industry standard technologies such as TLS and SRTP to encrypt all data in transit between users' devices and Microsoft datacenters, and between Microsoft datacenters. This includes messages, files, meetings, and other content. Enterprise data is also encrypted at rest in Microsoft datacenters, in a way that allows organizations to decrypt content if needed, to meet their security and compliance obligations, such as eDiscovery.

Encryption for Teams

Teams uses TLS and MTLS to encrypt instant messages. All server-to-server traffic requires MTLS, regardless of whether the traffic is confined to the internal network or crosses the internal network perimeter.

This table summarizes the protocols used by Teams.

Traffic Encryption

Traffic type	**Encrypted by**
Server-to-server	MTLS
Client-to-server (ex. instant messaging and presence)	TLS
Media flows (ex. audio and video sharing of media)	TLS
Audio and video sharing of media	SRTP/TLS
Signaling	TLS

Media Encryption

Media traffic is encrypted using Secure RTP (SRTP), a profile of Real-Time Transport Protocol (RTP) that provides confidentiality, authentication, and replay attack protection to RTP traffic. SRTP uses a session key generated by using a secure random number generator and exchanged using the signaling TLS channel. Client to Client media traffic is negotiated through a Client to Server connection signaling, but is encrypted using SRTP when going direct Client to Client.

Teams uses a credentials-based token for secure access to media relays over TURN. Media relays exchange the token over a TLS-secured channel.

FIPS

Teams uses FIPS (Federal Information Processing Standard) compliant algorithms for encryption key exchanges. For more information on the implementation of FIPS, please see Federal Information Processing Standard (FIPS) Publication 140-2.

User and Client Authentication

A trusted user is one whose credentials have been authenticated by Azure AD in Microsoft 365 or Office 365.

Authentication is the provision of user credentials to a trusted server or service. Teams uses the following authentication protocols, depending on the status and location of the user.

- **Modern Authentication (MA)** is the Microsoft implementation of OAUTH 2.0 for client to server communication. It enables security features such as Multi-Factor Authentication and Conditional Access. In order to use MA, both the online tenant and the clients need to be enabled for MA. The Teams clients across PC and mobile, as well as the web client, all support MA.

> **NOTE**
> If you need to brush up on Azure AD authentication and authorization methods, this article's Introduction and 'Authentication basics in Azure AD' sections will help.

Teams authentication is accomplished through Azure AD and OAuth. The process of authentication can be simplified to:

- User Login > Token issuance > subsequent request use issued token.

Requests from client to server are authenticated and authorized via Azure AD with the use of OAuth. Users with valid credentials issued by a federated partner are trusted and pass through the same process as native users. However, further restrictions can be put into place by administrators.

For media authentication, the ICE and TURN protocols also use the Digest challenge as described in the IETF TURN RFC.

Windows PowerShell and Team Management Tools

In Teams, IT Admins can manage their service via the Microsoft 365 admin center or by using Tenant Remote PowerShell (TRPS). Tenant admins use Modern Authentication to authenticate to TRPS.

Configuring Access to Teams at your Internet Boundary

For Teams to function properly (for users to be able to join meetings etc.), customers need to configure their internet access such that outbound UDP and TCP traffic to services in the Teams cloud is allowed. For more details, see here: Office 365 URLs and IP address ranges.

UDP 3478-3481 and TCP 443

The UDP 3478-3481 and TCP 443 ports are used by clients to request service for audio visuals. A client uses these two ports to allocate UDP and TCP ports respectively to enable these media flows. The media flows on these ports are protected with a key that is exchanged over a TLS protected signaling channel.

Federation Safeguards for Teams

Federation provides your organization with the ability to communicate with other organizations to share IM and presence. In Teams federation is on by default. However, tenant admins have the ability to control this via the Microsoft 365 admin center.

Addressing Threats to Teams Meetings

There are two options to control who arrives in Teams meetings and who will have access to the information you

present.

1. You can control who joins your meetings through settings for the **lobby**.

"WHO CAN BYPASS THE LOBBY" SETTING OPTIONS AVAILABLE IN MEETING OPTIONS PAGE	USER TYPES JOINING THE MEETING DIRECTLY	USER TYPES GOING TO THE LOBBY
People in my organization	- In-tenant - Guest of tenant	- Federated - Anonymous - PSTN dial-in
People in my organization and trusted organizations	- In-tenant - Guest of tenant - Federated	- Anonymous - PSTN dial-in
Everyone	- In-tenant - Guest of tenant - Federated Anonymous - PSTN dial-in	

2. The second way is through **structured meetings** (where Presenters can do about anything that should be done, and attendees have a controlled experience). After joining a structured meeting, presenters control what attendees can do in the meeting.

ACTIONS	PRESENTERS	ATTENDEES
Speak and share their video	Y	Y
Participate in meeting chat	Y	Y
Change settings in meeting options	Y	N
Mute other participants	Y	N
Remove other participants	Y	N
Share content	Y	N
Admit other participants from the lobby	Y	N
Make other participants presenters or attendees	Y	N
Start or stop recording	Y	N
Take control when another participant shares a PowerPoint	Y	N

Teams provides the capability for enterprise users to create and join real-time meetings. Enterprise users can also invite external users who do not have an Azure AD, Microsoft 365, or Office 365 account to participate in these meetings. Users who are employed by external partners with a secure and authenticated identity can also join meetings and, if promoted to do so, can act as presenters. Anonymous users cannot create or join a meeting as a presenter, but they can be promoted to presenter after they join.

For Anonymous users to be able to join Teams meetings, the Participants meetings setting in the Teams Admin Center must be toggled on.

> **NOTE**
>
> The term *anonymous users* means users that are not authenticated to the organizations tenant. In this context all external users are considered anonymous. Authenticated users include tenant users and Guest users of the tenant.

Enabling external users to participate in Teams meetings can be very useful, but entails some security risks. To address these risks, Teams uses the following additional safeguards:

- Participant roles determine meeting control privileges.
- Participant types allow you to limit access to specific meetings.
- Scheduling meetings is restricted to users who have an AAD account and a Teams license.
- Anonymous, that is, unauthenticated, users who want to join a dial-in conference, dial one of the conference access numbers. If the "Always allow callers to bypass the lobby" setting is turned *On* then they also need to wait until a presenter or authenticated user joins the meeting.

  Caution

  If you do not wish for Anonymous users (users you don't explicitly invite) to join a meeting, you need to ensure the **Anonymous users can join a meeting** is set to **Off** for the **Participant** meeting section.

It's also possible for an organizer to configure settings to let Dial-in callers be the first person in a meeting. This setting is configured in the Audio Conferencing settings for users and would apply to all meetings scheduled by the user.

> **NOTE**
>
> For more information on Guest and External Access in Teams, see this article. It covers what features guest or external users can expect to see and use when they login to Teams.
>
> If you're recording meetings and want to see a permissions matrix around accessing the content, consult this article and its matrix.

Participant Roles

Meeting participants fall into three groups, each with its own privileges and restrictions:

- **Organizer** The user who creates a meeting, whether impromptu or by scheduling. An organizer must be an authenticated in-tenant user and has control over all end-user aspects of a meeting.
- **Presenter** A user who is authorized to present information at a meeting, using whatever media is supported. A meeting organizer is by definition also a presenter and determines who else can be a presenter. An organizer can make this determination when a meeting is scheduled or while the meeting is under way.
- **Attendee** A user who has been invited to attend a meeting but who is not authorized to act as a presenter.

A presenter can also promote an attendee to the role of presenter during the meeting.

Participant Types

Meeting participants are also categorized by location and credentials. You can use both of these characteristics to decide which users can have access to specific meetings. Users can be divided broadly into the following categories:

1. **Users that belong to the tenant** These users have a credential in Azure Active Directory for the tenant. a. *People in my organization* – These users have a credential in Azure Active Directory for the tenant. *People in my*

organization includes invited Guest accounts. b. *Remote users* – These users are joining from outside the corporate network. They can include employees who are working at home or on the road, and others, such as employees of trusted vendors, who have been granted enterprise credentials for their terms of service. Remote users can create and join meetings and act as presenters. .

2. **Users that do not belong to the tenant** These users do not have credentials in Azure AD for the tenant. a. *Federated Users* - Federated users have valid credentials with federated partners and are therefore treated as authenticated by Teams, but are still Anonymous to the meeting organizer tenant. Federated users can join meetings and be promoted to presenters after they have joined the meeting, but they can't create meetings in enterprises with which they are federated. b. *Anonymous Users* - Anonymous users do not have an Active Directory identity and are not federated with the tenant.

Many meetings involve external users. Those same customers also want reassurance about the identity of external users before allowing those users to join a meeting. The next section describes how Teams limits meeting access to those user types that have been explicitly allowed, and requires all user types to present appropriate *credentials* when entering a meeting.

Participant Admittance

Caution

If you do not wish for Anonymous users (users you don't explicitly invite) to join a meeting, you need to ensure the **Anonymous users can join a meeting** is set to **Off** for the **Participant** meeting section.

In Teams, anonymous users can be transferred to a waiting area called the lobby. Presenters can then either *admit* these users into the meeting or *reject* them. When these users are transferred to the lobby, the presenter and attendees are notified, and the anonymous users must then wait until they are either accepted or rejected, or their connection times out.

By default, participants dialing in from the PSTN go directly to the meeting once an authenticated user joins the meeting, but this option can be changed to force dial-in participants to go to the lobby.

Meeting organizers control whether participants can join a meeting without waiting in the lobby. Each meeting can be set up to enable access using any one of the following methods:

The defaults are:

- *People in my Organization* - Everyone external to the organization will wait in the lobby until admitted.
- *People from my organization and trusted organizations* - Authenticated users and external users from Teams and Skype for Business domains that are in the external access allow list can bypass the lobby. All other users will wait in the lobby until admitted.
- *Everyone* - All meeting participants bypass the lobby once an authenticated user has joined the meeting.

Presenter Capabilities

Meeting organizers control whether participants can present during a meeting. Each meeting can be set up to limit presenters to any one of the following:

- *People in my organization* - All in tenant users, including guests, can present
- *People in my organization and trusted organizations* - All in tenant users, including guests, can present and external users from Teams and Skype for Business domains that are in the external access allow list can present.
- *Everyone* - All meeting participants are presenters.

Modify While Meeting is Running

It's possible to modify the meeting options while a meeting is on-going. The change, when saved, will impact the running meeting within seconds. It also effects any future occurrences of the meeting.

Related topics

Top 12 tasks for security teams to support working from home

Microsoft Trust Center

Manage meeting settings in Microsoft Teams

Optimize Microsoft 365 or Office 365 connectivity for remote users using VPN split tunneling

- Implementing VPN split tunneling

Meeting recordings in Teams, where recordings are stored, and who can access them

Azure Sentinel and Microsoft Teams

12/5/2020 • 17 minutes to read • Edit Online

Teams serves a central role in both communication and data sharing in the Microsoft 365 Cloud. Because the Teams service touches on so many underlying technologies in the Cloud, it can benefit from human and automated analysis not only when it comes to *hunting in logs*, but also in *real-time monitoring of meetings*. Azure Sentinel offers admins these solutions.

> **NOTE**
>
> Need a refresher on Azure Sentinel? This article is just the thing.

Sentinel and Microsoft Teams Activity Logs

This article focuses on collecting Teams activity logs in Azure Sentinel. Aside from allowing administrators to put security management under one pane of glass (including any selected 3rd party devices, Microsoft Threat Protection, and other Microsoft 365 Workloads), Sentinel workbooks, and runbooks can make security monitoring systematic. A good first step in this process is collecting the needed logs for analysis.

> **NOTE**
>
> More than one Microsoft 365 subscription can be surfaced in the same instance of Azure Sentinel. This will allow for realtime monitoring and hunting for threats in historical log file s. Administrators will be able to hunt using cross-resource queries, that is within a single resource group, across resource groups, or in another subscription.

Step 1: Collect Teams logs

This section has three parts:

1. Enabling Audit Logs in **Microsoft 365** (M365).
2. Registering an App in **Microsoft Azure** to permit authentication and authorization for log collection.
3. Registering the API subscription that will allow log collection via M365 API via **PowerShell**.

Enable Audit logs in M365

Because Teams logs activity through M365, audit logs aren't collected by default. Turn on this feature via these steps. Teams data is collected in the M365 audit under *Audit.General*.

Register an App in Microsoft Azure for log collection

> **TIP**
>
> Before you begin, you will need to record you **Application ID / Client ID**, and your **Tenant ID** for later use. Be sure to capture them as you walk through app registration steps below. You will see both IDs.
>
> - After your app is created, click App Registration on the quick launch side-bar > Find your new app's display name > copy the Application (client) ID.
> - Click Overview on the quick launch side-bar > copy the Directory (tenant) ID.

Authenticate and authorize an Azure Active Directory (Azure AD) app to collect log data from the API.

1. Navigate to your *Azure AD* blade in the Azure portal.
2. Click on *App registrations* in the quick launch side-bar.
3. Select *New registration*.
4. Name your Teams log collecting app and click *Register*.
5. Click along this path: *API Permissions* > *Add a permission* > *Office 365 Management APIs* > *Application permissions*.
6. Expand Activity Feed and check *ActivityFeed.Read*.
7. Choose *Grand admin consent* here. Click Yes when prompted asking if you mean it.
8. Click *Certificates and Secrets* in the side-bar> *New client secret* button.
9. On the New client secret window, enter a description for the new Client Secret, make sure you choose 'Never' for Expiration, and click *Add*.

> **IMPORTANT**
>
> It's **critical** to copy the new client secret into a password manager entry that goes under the name of the newly created app. You won't be able to get back to look at this secret after the closing out of the Azure blade (*blade* being the Azure term for window).

Register the API with PowerShell to collect Teams logs

The final step in setup is to collect and register the API subscription so that you can collect your log data. This is done via PowerShell REST calls to the M365 Management Activity API.

Be ready to supply **Application (client) ID**, the new **Client Secret**, your **URL domain for M365**, and **Directory (tenant) ID** values in the PowerShell cmdlet below.

```
$ClientID = "<Application (client) ID>"
$ClientSecret= "<Client secret>"
$loginURL= "https://login.microsoftonline.com/"
$tenantdomain= "<domain>.onmicrosoft.com"

$TenantGUID= "<Directory (tenant) ID>"
$resource = "https://manage.office.com"
$body = @{grant_type="client_credentials";resource=$resource;client_id=$ClientID;client_secret=$ClientSecret}
$oauth= Invoke-RestMethod-Method Post -Uri $loginURL/$tenantdomain/oauth2/token?api-version=1.0 -Body $body
$headerParams= @{'Authorization'="$($oauth.token_type) $($oauth.access_token)"}
$publisher = New-Guid
Invoke-WebRequest-Method Post -Headers $headerParams-Uri
"https://manage.office.com/api/v1.0/$tenantGuid/activity/feed/subscriptions/start?
contentType=Audit.General&PublisherIdentifier=$Publisher"
```

Step 2: Deploy a Sentinel Playbook to ingest the Teams logs

Azure Sentinel Playbooks (also called Logic Apps) will allow Azure to ingest your collected Teams data. The Logic App queries Office 365 to find the audit data it writes into the Azure Sentinel workspace.

Use this ARM template to deploy your Sentinel Playbook.

Things to remember:

1. You will need to walk through the ARM template and replace certain of the values with values appropriate for your own environment.

2. You will need to allow time between the ingestion of logs and looking at the results in Azure Sentinel.

   Wait for 5 to 10 minutes, understanding that if there is no data within the past 5 minutes you will see an error message. Check Audit logs and keep in mind that because Teams information is in the Audit.General

events, which collects more than Teams logs, results should appear within 5 to 10 minutes on systems that are in use. If using a text environment, be certain to use Teams in order to generate logging.

▶ Explanation of actions in the graphic:

> **TIP**
> You may choose to use an *Azure Function* to ingest those logs, instead, and if you do, the information on how to deploy is here, or here, depending on your preference.

With the connector (whichever of the options above you chose) running, you should see a custom table called O365API_CL in the Azure Sentinel workspace. This will house your Teams logs.

Step 3: Use Sentinel to monitor Microsoft Teams

Identity is an important attack vector to monitor when it comes to Microsoft Teams. Because Azure Active Directory (Azure AD) is the underpinning of Microsoft 365's directory, including Teams, collecting and hunting for threats in Azure AD logs around authentication will be useful in capturing suspicious behavior around identity. You can use the built-in connector to pull Azure AD data into Azure Sentinel, and use these detection and hunting queries to look for problems.

Regarding attacks specific to Microsoft Teams, threats to data, for example, Azure Sentinel also has means to monitor for them and hunt them down.

Create a parser for your data

The first thing to do in order to make sense of the large set of collected data is to give it meaning by parsing it. This is done with a Kusto Query Language (KQL) Function that makes the data easier to use.

> **NOTE**
> KQL functions are KQL queries saved as a data-type called 'function'. KQL functions have an alias that can be entered into the query box in Sentinel to quickly run the query again. For more about KQL functions and how to build a parser function, read this Tech Community article.

The parser below is a customizable example aimed at selecting a subset of the Office 365 Management API fields relevant to *Teams*. There is also a suggested parser GitHub, but the parser below can be modified to fit different needs and preferences.

```
O365API_CL
| where Workload_s =~ "MicrosoftTeams"
| project TimeGenerated,
          Workload=Workload_s,
          Operation=Operation_s,
          TeamName=columnifexists('TeamName_s', ""),
          UserId=columnifexists('UserId_s', ""),
          AddOnName=columnifexists('AddOnName_s', AddOnGuid_g),
          Members=columnifexists('Members_s', ""),
          Settings=iif(Operation_s contains "Setting", pack("Name", columnifexists('Name_s', ""), "Old Value",
columnifexists('OldValue_s', ""), "New Value", columnifexists('NewValue_s', "")),""),
          Details=pack("Id", columnifexists('Id_g', ""),  "OrganizationId", columnifexists('OrganizationId_g',
""), "UserType", columnifexists('UserType_d', ""), "UserKey", columnifexists('UserKey_g', ""), "TeamGuid",
columnifexists('TeamGuid_s', ""))
```

Save the parser as a KQL function, with an alias of TeamsData. It will be used for the queries to follow. Details on

configuring and using a KQL function as a parser can be found in this Tech Community article.

Helpful hunting KQL queries

Use these queries to familiarize yourself with your Teams data and Teams environment. Knowing how the environment should look and behave is a good first step in recognizing suspicious activity. From there, you can branch out into threat hunting.

Federated external users query

Get the list of Teams sites that have federated external users. These users will have a domain name / UPN suffix that *isn't* owned by your organization. In this example query, the organization owns contoso.com.

```
TeamsData
| where TimeGenerated > ago(7d)
| where Operation =~ "MemberAdded"
| extend UPN = tostring(parse_json(Members)[0].Upn)
| where UPN !endswith "contoso.com"
| where parse_json(Members)[0].Role == 3
| project TeamName, Operation, UserId, Members, UPN
```

> **TIP**
>
> To learn more about External and Guest access types in Teams see this article, or the *Participant Types* section in the Teams Security Guide.

Who recently joined / Whose role changed

Query a specific user to check if they were added to a Teams channel in the last 7 days, or within a week:

```
TeamsData
| where TimeGenerated > ago(7d)
| where Operation =~ "MemberAdded"
| where Members contains "UserName"
```

Was a user's role changed for a Team in the last 7 days:

```
TeamsData
| where TimeGenerated > ago(7d)
| where Operation =~ "MemberRoleChanged"
| where Members contains "Role" and Members contains "1"
```

External users from unknown or new organizations

In Teams, you can add external users to your environment or channels. Organizations often have a limited number of key partnerships and add users from among these partners. This KQL looks at external users added to teams who come from organizations that haven't been seen or added before.

```
// If you have more than 14 days worth of Teams data change this value
let data_date = 14d;
// If you want to look at users further back than the last day change this value
let lookback_data = 1d;
let known_orgs = (
TeamsData
| where TimeGenerated > ago(data_date)
| where Operation =~ "MemberAdded" or Operation =~ "TeamsSessionStarted"
// Extract the correct UPN and parse our external organization domain
| extend UPN = iif(Operation == "MemberAdded", tostring(parse_json(Members)[0].UPN), UserId)
| extend Organization = tostring(split(split(UPN, "_")[1], "#")[0])
| where isnotempty(Organization)
| summarize by Organization);
TeamsData
| where TimeGenerated > ago(lookback_data)
| where Operation =~ "MemberAdded"
| extend UPN = tostring(parse_json(Members)[0].UPN)
| extend Organization = tostring(split(split(UPN, "_")[1], "#")[0])
| where isnotempty(Organization)
| where Organization !in (known_orgs)
// Uncomment the following line to map query entities is you plan to use this as a detection query
//| extend timestamp = TimeGenerated, AccountCustomEntity = UPN
```

External users who were added and then removed

Attackers with some level of existing access may add a new external account to Teams to access and exfiltrate data. They may also quickly remove that user to hide that they made access. This query hunts for external accounts that are added to Teams and swiftly removed to help identify suspicious behavior.

```
// If you want to look at user added further than 7 days ago adjust this value
let time_ago = 7d;
// If you want to change the timeframe of how quickly accounts need to be added and removed change this value
let time_delta = 1h;
TeamsData
| where TimeGenerated > ago(time_ago)
| where Operation =~ "MemberAdded"
| extend UPN = tostring(parse_json(Members)[0].UPN)
| project TimeAdded=TimeGenerated, Operation, UPN, UserWhoAdded = UserId, TeamName, TeamGuid =
tostring(Details.TeamGuid)
| join (
TeamsData
| where TimeGenerated > ago(time_ago)
| where Operation =~ "MemberRemoved"
| extend UPN = tostring(parse_json(Members)[0].UPN)
| project TimeDeleted=TimeGenerated, Operation, UPN, UserWhoDeleted = UserId, TeamName, TeamGuid =
tostring(Details.TeamGuid)) on UPN, TeamGuid
| where TimeDeleted < (TimeAdded + time_delta)
| project TimeAdded, TimeDeleted, UPN, UserWhoAdded, UserWhoDeleted, TeamName, TeamGuid
// Uncomment the following line to map query entities is you plan to use this as a detection query
//| extend timestamp = TimeAdded, AccountCustomEntity = UPN
```

New bot or application added

Teams has the ability to include apps or bots in a Team to extend the feature set. This includes custom apps and bots. In some cases, an app or bot could be used to establish persistence in Teams without needing a user account, as well as access files and other data. This query hunts for apps or bots that are new to Teams.

```
// If you have more than 14 days worth of Teams data change this value
let data_date = 14d;
let historical_bots = (
TeamsData
| where TimeGenerated > ago(data_date)
| where isnotempty(AddOnName)
| project AddOnName);
TeamsData
| where TimeGenerated > ago(1d)
// Look for add-ins we have never seen before
| where AddOnName in (historical_bots)
// Uncomment the following line to map query entities is you plan to use this as a detection query
//| extend timestamp = TimeGenerated, AccountCustomEntity = UserId
```

User accounts who are Owners of large numbers of Teams

Attackers looking to elevate their privileges may assign themselves Owner privileges of a large number of diverse Teams, when, usually, users create and own a small number of Teams around specific topics. This KQL query looks for suspicious behavior.

```
// Adjust this value to change how many teams a user is made owner of before detecting
let max_owner_count = 3;
// Change this value to adjust how larger timeframe the query is run over.
let time_window = 1d;
let high_owner_count = (TeamsData
| where TimeGenerated > ago(time_window)
| where Operation =~ "MemberRoleChanged"
| extend Member = tostring(parse_json(Members)[0].UPN)
| extend NewRole = toint(parse_json(Members)[0].Role)
| where NewRole == 2
| summarize dcount(TeamName) by Member
| where dcount_TeamName > max_owner_count
| project Member);
TeamsData
| where TimeGenerated > ago(time_window)
| where Operation =~ "MemberRoleChanged"
| extend Member = tostring(parse_json(Members)[0].UPN)
| extend NewRole = toint(parse_json(Members)[0].Role)
| where NewRole == 2
| where Member in (high_owner_count)
| extend TeamGuid = tostring(Details.TeamGuid)
// Uncomment the following line to map query entities is you plan to use this as a detection query
//| extend timestamp = TimeGenerated, AccountCustomEntity = Member
```

Many Team deletions by a single user

Attackers can cause disruptions and jeopardize projects and data by deleting multiple teams. Because teams are generally deleted by individual Owners, a central deletion of many teams can be a sign of trouble. This KQL looks for single users who delete multiple teams.

```
// Adjust this value to change how many Teams should be deleted before including
let max_delete = 3;
// Adjust this value to change the timewindow the query runs over
let time_window = 1d;
let deleting_users = (
TeamsData
| where TimeGenerated > ago(time_window)
| where Operation =~ "TeamDeleted"
| summarize count() by UserId
| where count_ > max_delete
| project UserId);
TeamsData
| where TimeGenerated > ago(time_window)
| where Operation =~ "TeamDeleted"
| where UserId in (deleting_users)
| extend TeamGuid = tostring(Details.TeamGuid)
| project-away AddOnName, Members, Settings
// Uncomment the following line to map query entities is you plan to use this as a detection query
//| extend timestamp = TimeGenerated, AccountCustomEntity = UserId
```

Expanding your thread hunting opportunities

You can expand your hunting by combining queries from resources like Azure Active Directory (Azure AD), or other Office 365 workloads with your Teams queries. One example is combining detection of suspicious patterns in Azure AD SigninLogs, and using that information while hunting for Team Owners.

```
let timeRange = 1d;
let lookBack = 7d;
let threshold_Failed = 5;
let threshold_FailedwithSingleIP = 20;
let threshold_IPAddressCount = 2;
let isGUID = "[0-9a-z]{8}-[0-9a-z]{4}-[0-9a-z]{4}-[0-9a-z]{4}-[0-9a-z]{12}";
let azPortalSignins = SigninLogs
| where TimeGenerated >= ago(timeRange)
// Azure Portal only and exclude non-failure Result Types
| where AppDisplayName has "Azure Portal" and ResultType !in ("0", "50125", "50140")
// Tagging identities not resolved to friendly names
| extend Unresolved = iff(Identity matches regex isGUID, true, false);
// Lookup up resolved identities from last 7 days
let identityLookup = SigninLogs
| where TimeGenerated >= ago(lookBack)
| where not(Identity matches regex isGUID)
| summarize by UserId, lu_UserDisplayName = UserDisplayName, lu_UserPrincipalName = UserPrincipalName;
// Join resolved names to unresolved list from portal signins
let unresolvedNames = azPortalSignins | where Unresolved == true | join kind= inner (
   identityLookup ) on UserId
| extend UserDisplayName = lu_UserDisplayName, UserPrincipalName = lu_UserPrincipalName
| project-away lu_UserDisplayName, lu_UserPrincipalName;
// Join Signins that had resolved names with list of unresolved that now have a resolved name
let u_azPortalSignins = azPortalSignins | where Unresolved == false | union unresolvedNames;
let failed_signins = (u_azPortalSignins
| extend Status = strcat(ResultType, ": ", ResultDescription), OS = tostring(DeviceDetail.operatingSystem),
Browser = tostring(DeviceDetail.browser)
| extend FullLocation = strcat(Location,'|', LocationDetails.state, '|', LocationDetails.city)
| summarize TimeGenerated = makelist(TimeGenerated), Status = makelist(Status), IPAddresses =
makelist(IPAddress), IPAddressCount = dcount(IPAddress), FailedLogonCount = count()
by UserPrincipalName, UserId, UserDisplayName, AppDisplayName, Browser, OS, FullLocation
| mvexpand TimeGenerated, IPAddresses, Status
| extend TimeGenerated = todatetime(tostring(TimeGenerated)), IPAddress = tostring(IPAddresses), Status =
tostring(Status)
| project-away IPAddresses
| summarize StartTime = min(TimeGenerated), EndTime = max(TimeGenerated) by UserPrincipalName, UserId,
UserDisplayName, Status, FailedLogonCount, IPAddress, IPAddressCount, AppDisplayName, Browser, OS, FullLocation
| where (IPAddressCount >= threshold_IPAddressCount and FailedLogonCount >= threshold_Failed) or
FailedLogonCount >= threshold_FailedwithSingleIP
| project UserPrincipalName);
TeamsData
| where TimeGenerated > ago(time_window)
| where Operation =~ "MemberRoleChanged"
| extend Member = tostring(parse_json(Members)[0].UPN)
| extend NewRole = toint(parse_json(Members)[0].Role)
| where NewRole == 2
| where Member in (failed_signins)
| extend TeamGuid = tostring(Details.TeamGuid)
```

Also, you can make the SigninLogs detections specific to Teams by adding a filter for only Teams-based sign-ins by using:

```
| where AppDisplayName startswith "Microsoft Teams"
```

To help explain using `where AppDisplayName starts with "Microsoft Teams"` further, the KQL below demonstrates a successful logon from one IP address with failure from a different IP address, but scoped only to Teams sign-ins:

```
let timeFrame = 1d;
let logonDiff = 10m;
SigninLogs
  | where TimeGenerated >= ago(timeFrame)
  | where ResultType == "0"
  | where AppDisplayName startswith "Microsoft Teams"
  | project SuccessLogonTime = TimeGenerated, UserPrincipalName, SuccessIPAddress = IPAddress, AppDisplayName,
SuccessIPBlock = strcat(split(IPAddress, ".")[0], ".", split(IPAddress, ".")[1])
  | join kind= inner (
      SigninLogs
      | where TimeGenerated >= ago(timeFrame)
      | where ResultType !in ("0", "50140")
      | where ResultDescription !~ "Other"
      | where AppDisplayName startswith "Microsoft Teams"
      | project FailedLogonTime = TimeGenerated, UserPrincipalName, FailedIPAddress = IPAddress,
AppDisplayName, ResultType, ResultDescription
  ) on UserPrincipalName, AppDisplayName
  | where SuccessLogonTime < FailedLogonTime and FailedLogonTime - SuccessLogonTime <= logonDiff and
FailedIPAddress !startswith SuccessIPBlock
  | summarize FailedLogonTime = max(FailedLogonTime), SuccessLogonTime = max(SuccessLogonTime) by
UserPrincipalName, SuccessIPAddress, AppDisplayName, FailedIPAddress, ResultType, ResultDescription
  | extend timestamp = SuccessLogonTime, AccountCustomEntity = UserPrincipalName, IPCustomEntity =
SuccessIPAddress
```

Important information and updates

Thank you for content collaboration, Pete Bryan, Nicholas DiCola, and Matthew Lowe. Pete Bryan and the people he collaborates with will continue to develop detection and hunting queries for Teams, so keep in touch with this GitHub repository for updates. Monitor for updates to the parser and logic app used in this article. You can also join and contribute to the Azure Sentinel community. Thank you! Happy hunting.

Registering your application in Azure AD

Turn audit log search on or off

What is Azure Sentinel

Identity models and authentication for Microsoft Teams

9/25/2020 • 2 minutes to read • Edit Online

Microsoft Teams supports all the identity models that are available with Microsoft 365 and Office 365, which include:

- **Cloud-only**: User accounts are created and managed in Microsoft 365 or Office 365 and stored in Azure Active Directory (Azure AD). User sign-in credentials (account name and password) are validated by Azure AD.
- **Hybrid**: User accounts are typically managed in an on-premises Active Directory Domain Services (AD DS) forest. Depending on the configuration, credential validation can be done by Azure AD, AD DS, or a federated identity provider. This model uses directory synchronization from AD DS to Azure AD with Azure AD Connect.

For more information, see Microsoft 365 identity models and Azure AD.

Configurations

Depending on your organization's decisions of which identity model and configuration you use, the implementation steps may vary.

If you haven't already deployed Microsoft 365 or Office 365 and an identity model, use this table.

IDENTITY MODEL	DEPLOYMENT CHECKLIST	ADDITIONAL INFORMATION
All	1. Compare Microsoft 365 and Office 365 plan options and obtain a subscription and a tenant. 2. Create a Microsoft 365 or Office 365 organization for your tenant. 3. Purchase Microsoft 365 or Office 365 licenses for the tenant 4. Configure domains and admin user accounts.	• Office 365 plan options • Compare Microsoft 365 for business Plans • Buy or remove subscription licenses • Add licenses to a subscription • Set up Microsoft 365 for business • Add a domain with the setup wizard Microsoft FastTrack is available to assist you.
Cloud identity	• Create user accounts with the Microsoft 365 admin center	• Add users and assign licenses
Hybrid identity	1. Install Azure AD Connect. 2. Configure directory synchronization. 3. Manage users and groups with AD DS tools.	• Set up directory synchronization

IDENTITY MODEL	DEPLOYMENT CHECKLIST	ADDITIONAL INFORMATION
Hybrid identity with federated authentication	1. Install and configure a federated identity provider such as AD FS. 2. Install Azure AD Connect and configure directory synchronization and federated authentication. 3. Manage users and groups with AD DS tools.	• Plan your AD FS deployment • Checklist: Deploy your federation server farm • Configure extranet access for AD FS • Set up a trust between AD FS and Azure AD • Verify and manage single sign-on with ADFS • Set up directory synchronization

Multi-factor authentication

Passwords are the most common method of authentication for signing in to a computer or online service, but they are also the most vulnerable. People can choose easy passwords and use the same passwords for multiple sign-ins to different computers and services.

To provide an additional level of security for sign-ins, use multi-factor authentication (MFA), which requires both a password and an additional verification method such as:

- A text message sent to a phone that requires the user to type a verification code.
- A phone call.
- The Microsoft Authenticator smart phone app.
- Other methods available with hybrid identity and federated authentication.

MFA is supported with any Microsoft 365 or Office 365 plan that includes Microsoft Teams. It is highly recommended that at a minimum you require MFA for that accounts that are assigned administrator roles, such as Teams service admin.

You should also roll out MFA to your users. Once your users are enrolled for MFA, the next time they sign in, they will see a message that asks them to set up their additional verification method.

For more information, see Multi-factor authentication for Microsoft 365.

Sign in to Microsoft Teams

12/5/2020 • 9 minutes to read • Edit Online

Windows users

Microsoft recommends that organizations use recent versions of Windows 10 with either Hybrid Domain Join or Azure AD Join configuration. Using recent versions ensures that users' accounts are primed in Windows' Web Account Manager, which in turn enables single sign-on to Teams and other Microsoft applications. Single sign-on provides a better user experience (silent sign in) and a better security posture.

Microsoft Teams uses modern authentication to keep the sign-in experience simple and secure. To see how users sign in to Teams, read Sign in to Teams.

How modern authentication works

Modern authentication is a process that lets Teams know that users have already entered their credentials, such as their work email and password elsewhere, and they shouldn't be required to enter them again to start the app. The experience varies depending on a couple factors, like if users are working in Windows or on a Mac. It will also vary depending on whether your organization has enabled single-factor authentication or multi-factor authentication. Multi-factor authentication usually involves verifying credentials via a phone, providing a unique code, entering a PIN, or presenting a thumbprint. Here's a rundown of each modern authentication scenario.

Modern authentication is available for every organization that uses Teams. If users aren't able to complete the process, there might be an underlying issue with your organization's Azure AD configuration. For more information, see Why am I having trouble signing in to Microsoft Teams?

- If users have already signed in to Windows or to other Office apps with their work or school account, when they start Teams they're taken straight to the app. There's no need for them to enter their credentials.
- Microsoft recommends using Windows 10 version 1903 or later for the best Single Sign-On experience.
- If users are not signed in to their Microsoft work or school account anywhere else, when they start Teams, they're asked to provide either single-factor or multi-factor authentication (SFA or MFA). This process depends on what your organization has decided they'd like the sign-in procedure to require.
- If users are signed in to a domain-joined computer, when they start Teams, they might be asked to go through one more authentication step, depending on whether your organization opted to require MFA or if their computer already requires MFA to sign in. If their computer already requires MFA to sign in, when they open up Teams, the app automatically starts.
- On Domain joined PCs, when SSO isn't possible Teams may pre-fill its login screen with the user principal name (UPN). There are cases where you may not want this, especially if your organization uses different UPNs on-premises and in Azure Active Directory. If that's the case, you can use the following Windows registry key to turn off pre-population of the UPN:

  Computer\HKEY_CURRENT_USER\Software\Microsoft\Office\Teams
  SkipUpnPrefill(REG_DWORD)
  0x00000001 (1)

  > **NOTE**
  > Skipping or ignoring user name pre-fill for user names that end in ".local" or ".corp" is on by default, so you don't need to set a registry key to turn these off.

Signing out of Teams after completing modern authentication

To sign out of Teams, users can select their profile picture at the top of the app, and then select **Sign out**. They can also right-click the app icon in their taskbar, and then select **Log out**. Once they've sign out of Teams, they need to enter their credentials again to launch the app.

Signing in to another account on a Domain Joined computer

Users on domain-joined computer may not be able to sign in to Teams with another account in the same Active Directory domain.

MacOS users

On MacOS, Teams will prompt users to enter their username and credentials and may prompt for multi-factor authentication depending on your organization's settings. Once users enter their credentials, they won't be required to provide them again. From that point on, Teams automatically starts whenever they're working on the same computer.

Teams on iOS and Android users

Upon sign in, mobile users will see a list of all the Microsoft 365 accounts that are either currently signed-in or were previously signed-in on their device. Users can tap on any of the accounts to sign in. There are two scenarios for mobile sign in:

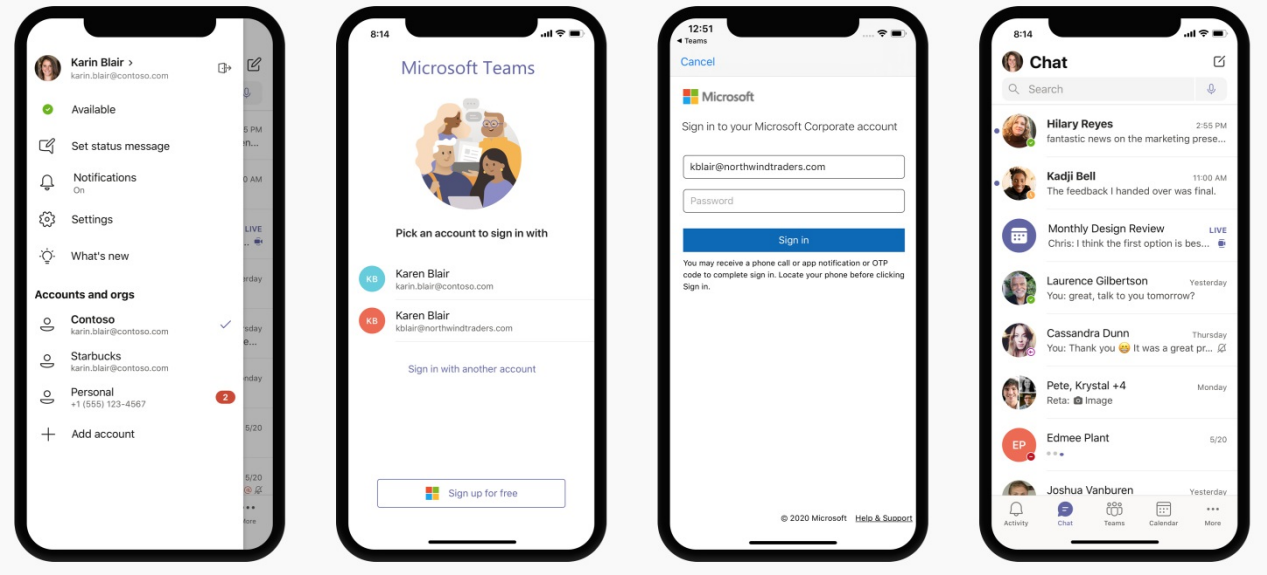
1. If the selected account is currently signed in to other Office 365 or Microsoft 365 apps, then the user will be taken straight to Teams. There's no need for the user to enter their credentials.
2. If user isn't signed in to their Microsoft 365 account anywhere else, they will be asked to provide single-factor or multi-factor authentication (SFA or MFA), depending on what your organization has configured for mobile sign-in policies.

> **NOTE**
> For users to experience the sign on experience as described in this section, their devices must be running Teams for iOS version 2.0.13 (build 2020061704) or later, or Teams for Android version 1416/1.0.0.2020061702 or later.

Using Teams with multiple accounts

Teams for iOS and Android supports the use of multiple work or school and multiple personal accounts side by side. Teams desktop applications will support one work/school and one personal account side by side in December 2020, with support for multiple work/school accounts coming at a later date.

The following images show how users can add multiple accounts in Teams mobile applications.



Restrict sign in to Teams

Organization may want to restrict how corporate-approved apps are used on managed devices, for example to restrict students' or employees' ability to access data from other organizations or use corporate-approved apps for personal scenarios. These restrictions can be enforced by setting Devices Policies that Teams applications recognize.

How to restrict sign in on mobile devices

Teams for iOS and Android offers IT administrators the ability to push account configurations to Microsoft 365 accounts. This capability works with any Mobile Device Management (MDM) provider that uses the Managed App Configuration channel for iOS or the Android Enterprise channel for Android.

For users enrolled in Microsoft Intune, you can deploy the account configuration settings using Intune in the Azure portal.

Once account setup configuration has been configured in the MDM provider, and after the user enrolls their device, on the sign-in page, Teams for iOS and Android will only show the allowed account(s) on the Teams sign-in page. The user can tap on any of the allowed accounts on this page to sign in.

Set the following configuration parameters in the Azure Intune portal for managed devices.

PLATFORM	KEY	VALUE
iOS	**IntuneMAMAllowedAccountsOnly**	**Enabled**: The only account allowed is the managed user account defined by the IntuneMAMUPN key. **Disabled** (or any value that is not a case insensitive match to **Enabled**): Any account is allowed.
iOS	**IntuneMAMUPN**	UPN of the account allowed to sign in to Teams. For Intune enrolled devices, the {{userprincipalname}} token may be used to represent the enrolled user account.

PLATFORM	KEY	VALUE
Android	**com.microsoft.intune.mam.AllowedAccountUPNs**	Only account(s) allowed are the managed user account(s) defined by this key. One or more semi-colons;]- delimited UPNs. For Intune enrolled devices, the {{userprincipalname}} token may be used to represent the enrolled user account.

Once the account setup configuration has been set, Teams will restrict the ability to sign in, so that only allowed accounts on enrolled devices will be granted access.

To create an app configuration policy for managed iOS/iPadOS devices, see Add app configuration policies for managed iOS/iPadOS devices.

To create an app configuration policy for managed Android devices, see Add app configuration policies for managed Android devices.

How to restrict sign in on desktop devices

Teams apps on Windows and MacOS are gaining support for device policies that restrict sign in to your organization. The policies can be set via usual Device Management solutions such as MDM (Mobile Device Management) or GPO (Group Policy Object).

When this policy is configured on a device, users can only sign in with accounts homed in an Azure AD tenant that is included in the "Tenant Allow List" defined in the policy. The policy applies to all sign-ins, including first and additional accounts. If your organization spans multiple Azure AD tenants, you can include multiple Tenant IDs in the Allow List. Links to add another account may continue to be visible in the Teams app, but they won't be operable.

> **NOTE**
>
> 1. The policy only restricts sign-ins. It does not restrict the ability for users to be invited as guest in other Azure AD tenants, or switch to other tenants.
> 2. The policy requires Teams for Windows version 1.3.00.30866 or higher, and Teams for MacOS version 1.3.00.30882 (released mid-November 2020).

Policies for Windows Administrative Template files (ADMX/ADML) are available from the Download center. Additionally, you can manually set keys in Windows Registry:

- Value Name: RestrictTeamsSignInToAccountsFromTenantList
- Value Type: String
- Value Data: Tenant ID, or comma-separated list of Tenant IDs
- Path: use one of the following

Computer\HKEY_CURRENT_USER\SOFTWARE\Policies\Microsoft\Cloud\Office\16.0\Teams
Computer\HKEY_CURRENT_USER\SOFTWARE\Policies\Microsoft\Office\16.0\Teams
Computer\HKEY_CURRENT_USER\SOFTWARE\Microsoft\Office\16.0\Teams

Example: SOFTWARE\Policies\Microsoft\Office\16.0\Teams\RestrictTeamsSignInToAccountsFromTenantList = Tenant ID or SOFTWARE\Policies\Microsoft\Office\16.0\Teams\RestrictTeamsSignInToAccountsFromTenantList = Tenant ID 1,Tenant ID 2,Tenant ID 3

Policies for MacOS For MacOS managed devices, use .plist to deploy sign-in restrictions. The configuration

profile is a .plist file that consists of entries identified by a key (which denotes the name of the preference), followed by a value, which depends on the nature of the preference. Values can either be simple (such as a numerical value) or complex, such as a nested list of preferences.

- Domain: com.microsoft.teams
- Key: RestrictTeamsSignInToAccountsFromTenantList
- Data Type: String
- Comments: Enter comma separate list of Azure AD tenant ID(s)

Sign out on mobile devices

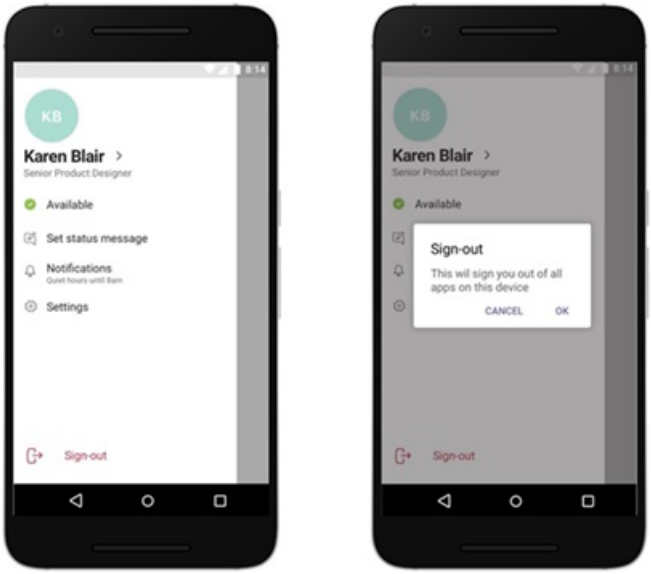
Mobile users can sign out of Teams by going to the menu, selecting the **More** menu, and then selecting **Sign out**. Once signed out, users will need to reenter their credentials the next time they launch the app.

> **NOTE**
>
> Teams for Android uses single sign-on (SSO) to simplify the sign in experience. Users should make sure to log out of **all** Microsoft apps, in addition to Teams, in order to completely log out on the Android platform.

Global sign in and sign out

The Teams Android app now supports Global sign-in and sign-out, to provide a hassle free sign-in and sign-out experience for Firstline Workers. Employees can pick a device from the shared device pool and do a single sign in to "make it theirs" for the duration of their shift. At the end of their shift, they should be able to perform sign out to globally sign out on the device. This with remove all of their personal and company information from the device so they can return the device to the device pool. To get this capability, the device must be in shared mode. To learn how to set up a shared device, see How to use a shared device mode in Android.

The sign-in experience looks similar to our standard Teams sign experience, while sign out will look like the following two images:



URLs and IP address ranges

Teams requires connectivity to the Internet. To understand endpoints that should be reachable for customers using Teams in Office 365 plans, Government, and other clouds, read Office 365 URLs and IP address ranges.

IMPORTANT

Teams presently requires access (TCP port 443) to the Google ssl.gstatic.com service (https://ssl.gstatic.com) for all users; this is true even if you're not using Gstatic. Teams will remove this requirement soon (early 2020), and we'll update this article accordingly at that time.

Related topics

Teams Troubleshooting

AppLocker application control policies in Microsoft Teams

7/30/2020 • 2 minutes to read • Edit Online

This article explains how to enable the Teams desktop client app with AppLocker application control policies. Use of AppLocker is designed to restrict program and script execution by non-administrative users. For more information and guidance on AppLocker, see What is AppLocker?.

The process for enabling Teams with AppLocker requires the creation of AppLocker-based allow listing policies. Policies are created with Group Policy management software and/or the use of Windows PowerShell cmdlets for AppLocker (see the AppLocker technical reference for more information). The AppLocker policy is saved in XML format and can be edited with any text or XML editor.

Teams allow list with AppLocker

AppLocker rules are organized into collections of rules. AppLocker rules apply to the targeted app, and they are the components that make up the AppLocker policy.

To allow Teams, we recommend that you use the publisher condition rules since all Teams app files are digitally signed.

We don't recommend the use of path rules because the Teams installation directory is user-writable. We also don't recommend the use of hash rules because the rules would have to be updated each time the Teams client app is updated.

Since Teams desktop executable files are digitally signed, the publisher condition identifies an app file based on its digital signature and embedded version attributes. The digital signature contains information about the company that created the app file (the publisher). The version information, which is obtained from the binary resource, includes the name of the product that the file is part of and the version number of the application file.

Example of publisher condition rules

For the Teams client app (all files, all versions) add the following to the Executable Rules & DLL Rules:

```
Publisher: O=MICROSOFT CORPORATION, L=REDMOND, S=WASHINGTON, C=US
Product name: MICROSOFT TEAMS
Product name: MICROSOFT TEAMS UPDATE
```

Related topics

What is AppLocker? AppLocker technical reference

Block access to SharePoint for specific users

9/22/2020 • 2 minutes to read • Edit Online

Applying any Conditional Access (CA) policy on SharePoint in Microsoft 365 is also applied to Teams. However, some organizations want to block access to SharePoint files (upload, download, view, edit, create) yet allow their employees to use Teams desktop, mobile, and web clients on unmanaged devices. Under the CA policy rules, blocking Sharepoint would lead to blocking Teams as well. This article explains how you can work around this limitation and allow your employees to continue using Teams while completely blocking access to files stored in SharePoint.

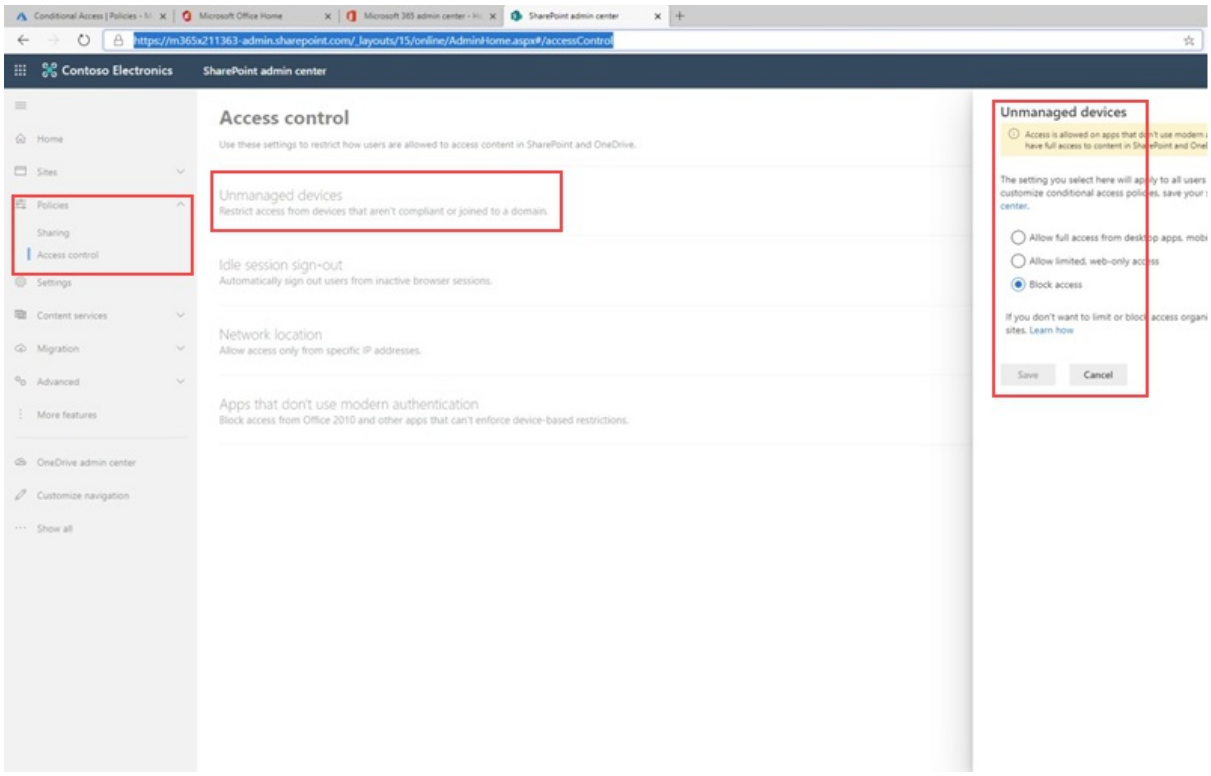
> **NOTE**
>
> Blocking or limiting access on unmanaged devices relies on Azure AD conditional access policies. Learn about Azure AD licensing. For an overview of conditional access in Azure AD, see Conditional access in Azure Active Directory. For info about recommended SharePoint Online access policies, see Policy recommendations for securing SharePoint sites and files. If you limit access on unmanaged devices, users on managed devices must use one of the supported OS and browser combinations, or they will also have limited access.

You can block or limit access for:

- Users in the organization or only some users or security groups.
- All sites in the organization or only some sites.

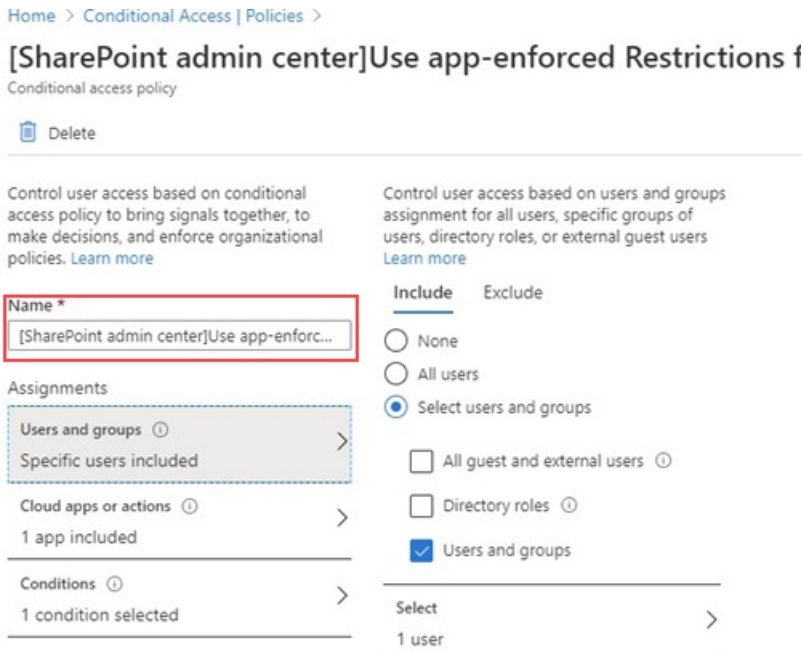
When access is blocked, users will see an error message. Blocking access helps provide security and protects secure data. When access is blocked, users will see an error message.

1. Open the SharePoint Admin Center.
2. Expand **Policies** > **Access Policies**.
3. In the **Unmanaged Devices** section, select **Block Access** and select **Save**.

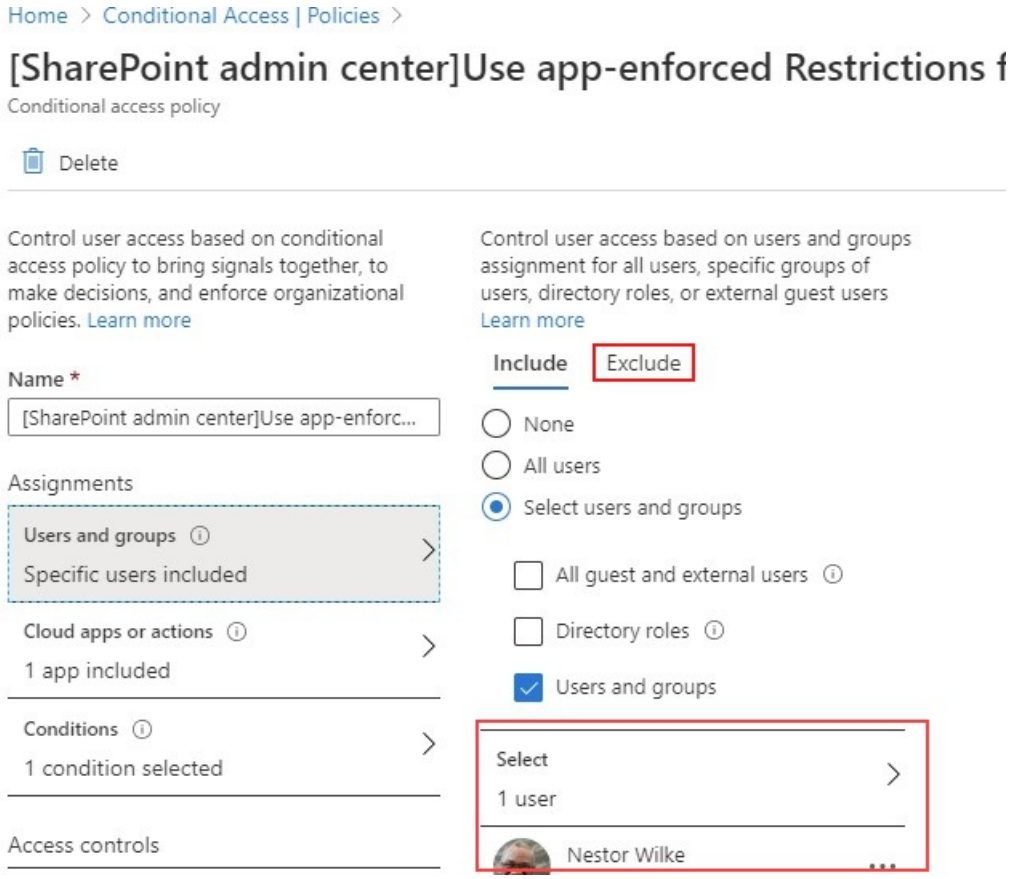


4. Open the Azure Active Directory portal and navigate to **Conditional Access Policies**.

   You'll see a new policy has been created by SharePoint that's similar to this example:



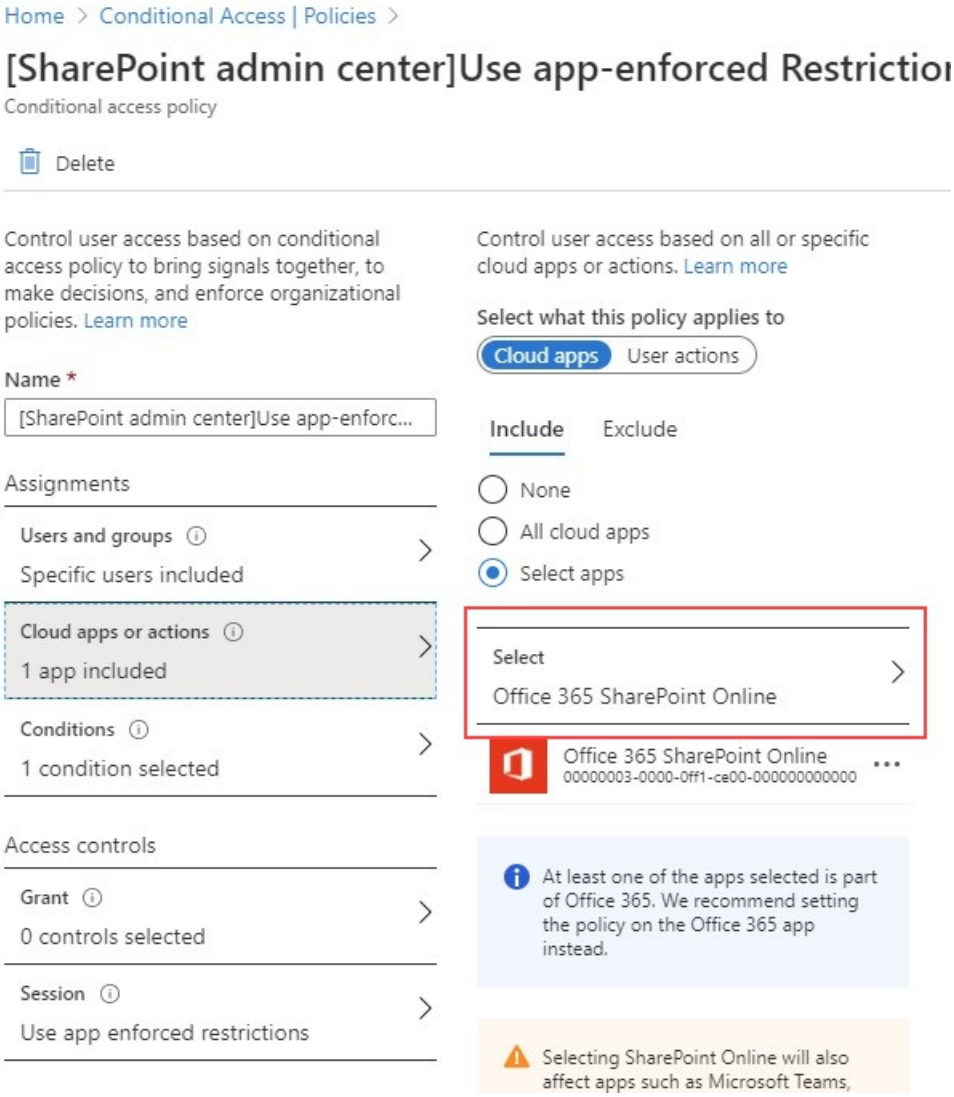
5. Update the policy to target only specific users or a group.



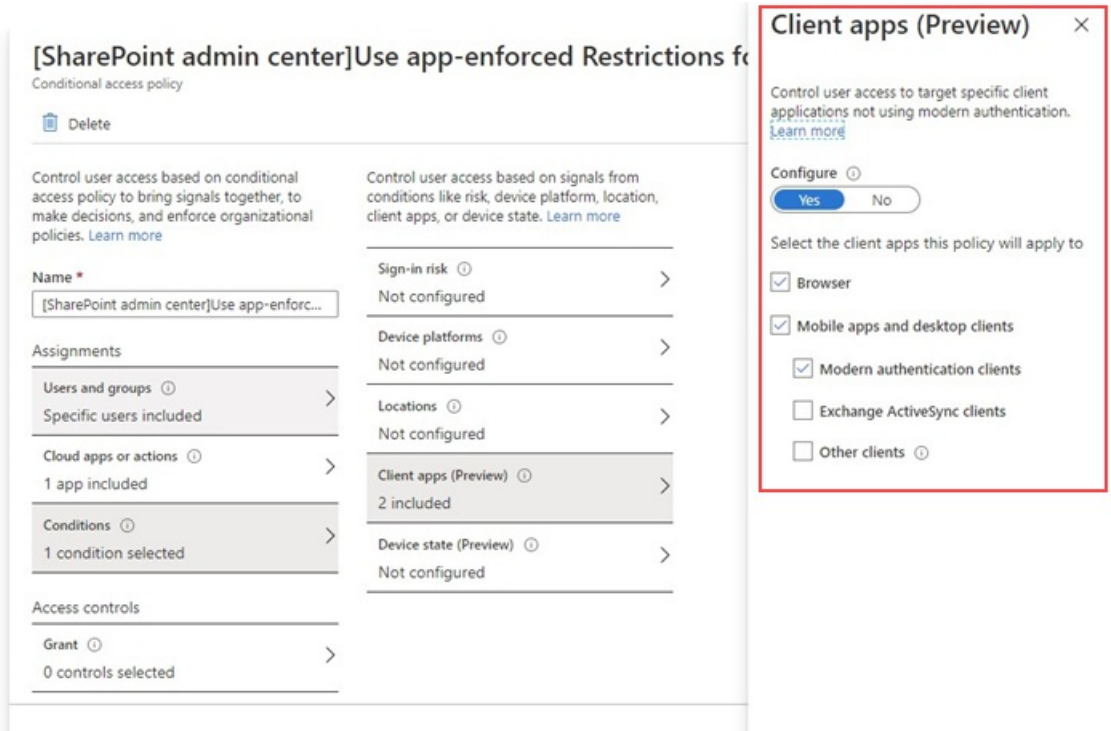
NOTE

Setting this policy will cut your access to the SharePoint admin portal. We recommended that you configure the exclusion policy and select the Global and SharePoint admins.

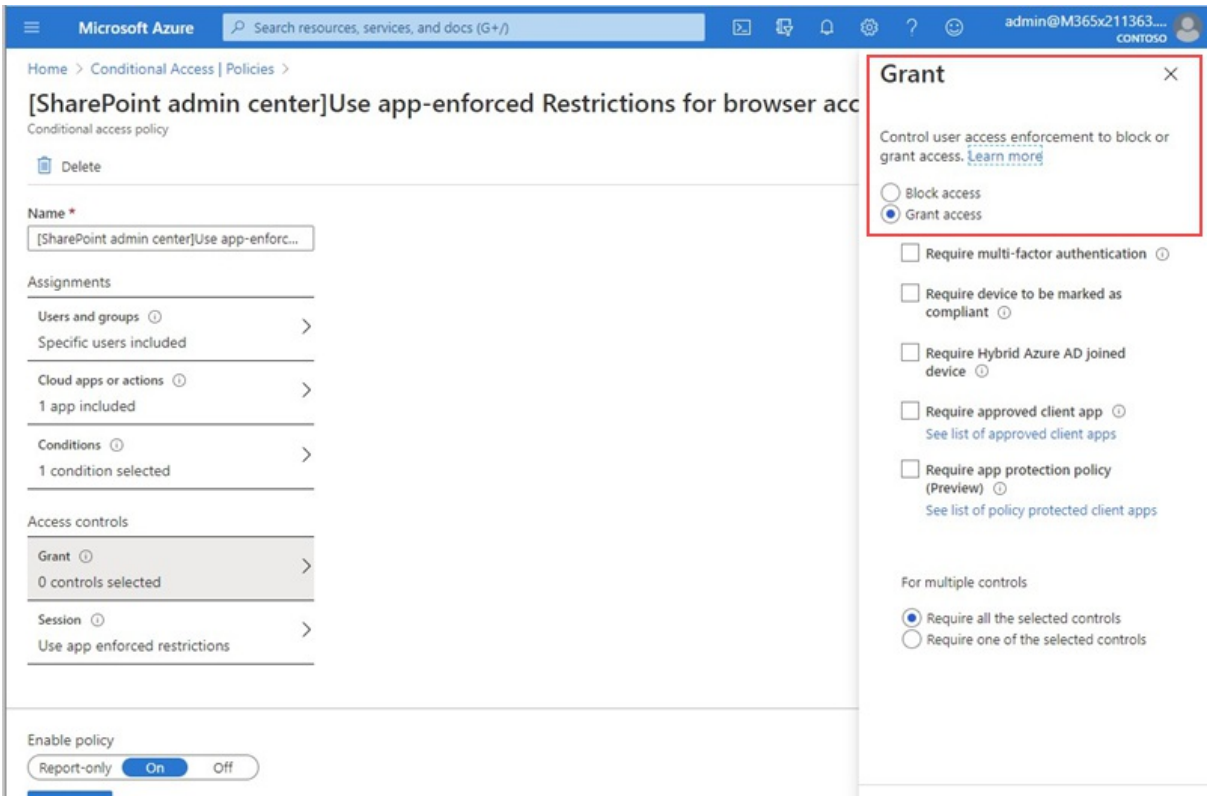
6. Verify that only SharePoint is selected as targeted Cloud App



7. Update **Conditions** to include desktop clients, as well.

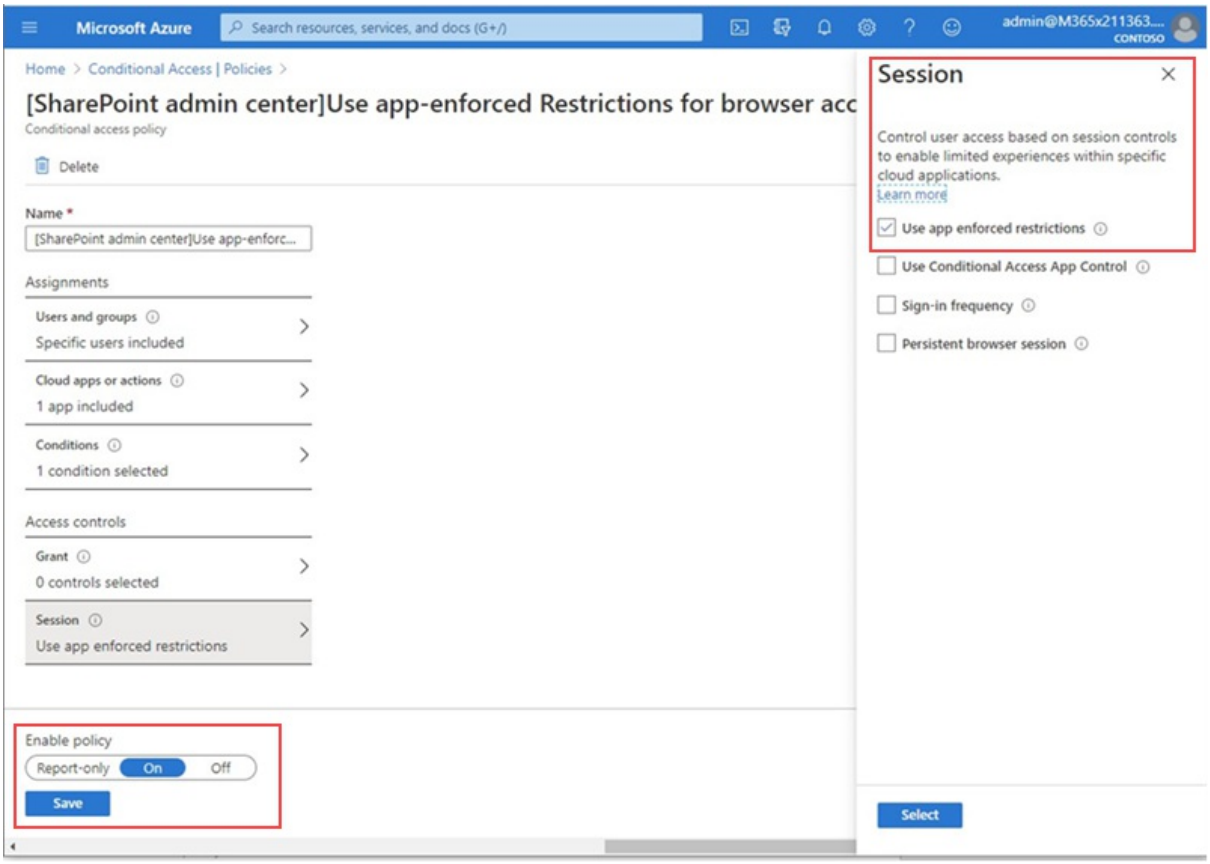


8. Make sure that **Grant access** is enabled

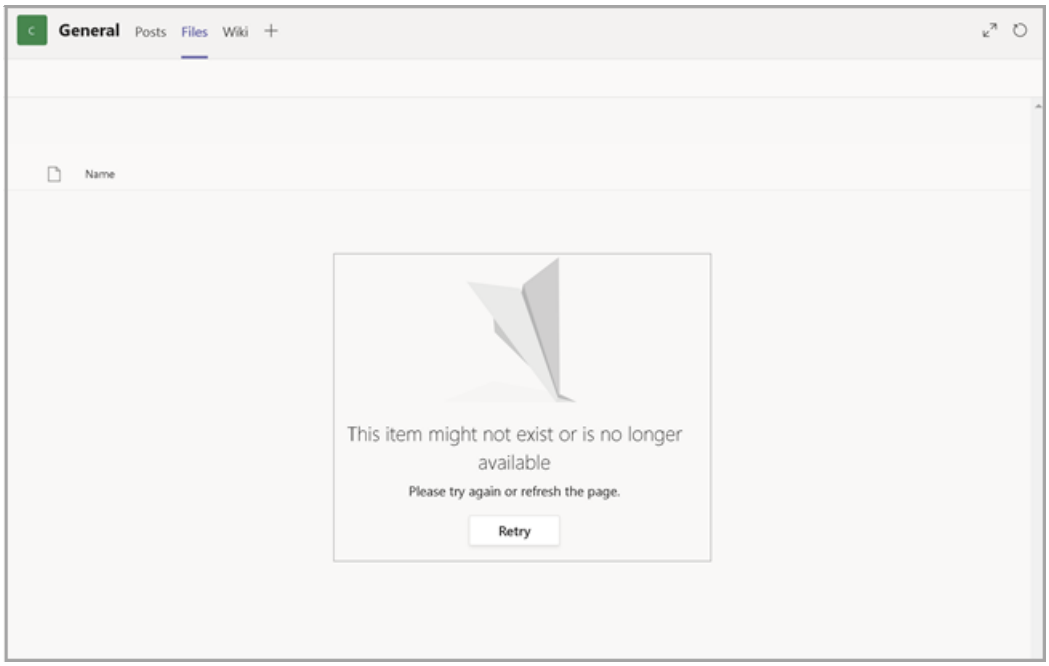


9. Make sure **Use app enforced restrictions** is enabled.

10. Enable your policy and select **Save**.



To test your policy, you need to sign out from any client such as the Teams desktop app or the OneDrive for Business sync client and sign in again to see the policy working. If your access has been blocked, you'll see a message in Teams that states the item might not exist.



In Sharepoint, you'll receive an access denied message.



Related topics

Control access for unmanaged devices in SharePoint

Information barriers in Microsoft Teams

12/5/2020 • 10 minutes to read • Edit Online

Information barriers (IB) are policies that an admin can configure to prevent individuals or groups from communicating with each other. IB is useful if, for example, one department is handling information that shouldn't be shared with other departments or a group needs to be prevented, or isolated, from communicating with anyone outside of that group.

NOTE

- Information barrier groups cannot be created across tenants.
- Using bots, AAD apps, and some APIs to add users is not supported in version 1.
- Private channels are compliant to information barrier policies that you configure.
- New: For Information about barriers support for SharePoint site connected to Teams, click here.

Information barrier policies also prevent lookups and discovery. If you attempt to communicate with someone you shouldn't be communicating with, you won't find that user in the people picker.

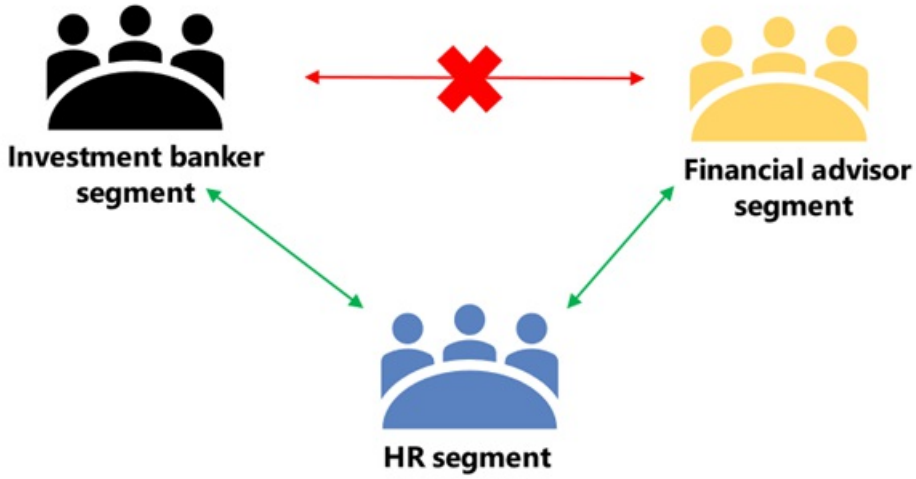
Background

The primary driver for information barriers comes from the financial services industry. The Financial Industry Regulatory Authority (FINRA) reviews information barriers and conflicts of interest within member firms and provides guidance as to how to manage such conflicts (FINRA 2241, Debt Research Regulatory Notice 15-31.

However, since introducing information barriers, many other areas have found them to be useful. Other common scenarios include:

- Education: Students in one school aren't able to look up contact details for students of other schools.
- Legal: Maintaining confidentiality of data obtained by the lawyer of one client from being accessed by a lawyer for the same firm representing a different client.
- Government: Information access and control are limited across departments and groups.
- Professional services: A group of people in a company is only able to chat with a client or specific customer via guest access during a customer engagement.

For example, Enrico belongs to the Banking segment and Pradeep belongs to the Financial advisor segment. Enrico and Pradeep can't communicate with each other because the organization's IB policy blocks communication and collaboration between these two segments. However, Enrico and Pradeep can communicate with Lee in HR.



When to use information barriers

You might want to use information barriers in situations like these:

- A team must be prevented from communicating or sharing data with a specific other team.
- A team must not communicate or share data with anyone outside of the team.

The Information Barrier Policy Evaluation Service determines whether a communication complies with information barrier policies.

Managing information barrier policies

Information barrier policies are managed in the Microsoft 365 Compliance Center (SCC) using PowerShell cmdlets. For more information, see Define policies for information barriers.

> **IMPORTANT**
> Before you set up or define policies, **you must enable scoped directory search in Microsoft Teams**. Wait at least a few hours after enabling scoped directory search before you set up or define policies for information barriers. Learn more about prerequisites for information barriers.

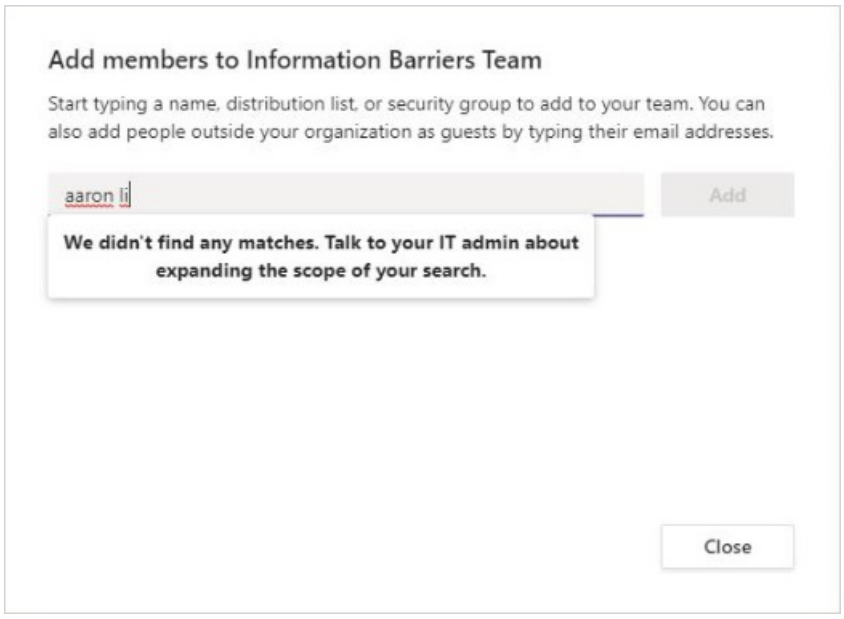
Information barriers administrator role

The IB Compliance Management role is responsible for managing information barrier policies. For more information about this role, see Permissions in the Microsoft 365 Compliance Center.

Information barrier triggers

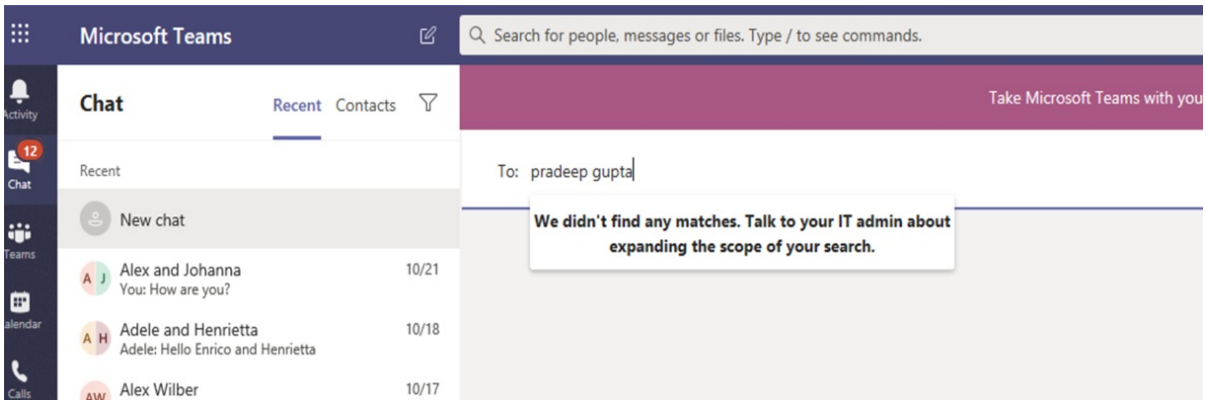
Information barrier policies are activated when the following Teams events take place:

- **Members are added to a team** - Whenever you add a user to a team, the user's policy must be evaluated against the information barrier policies of other team members. After the user is successfully added, the user can perform all functions in the team without further checks. If the user's policy blocks them from being added to the team, the user will not show up in search.

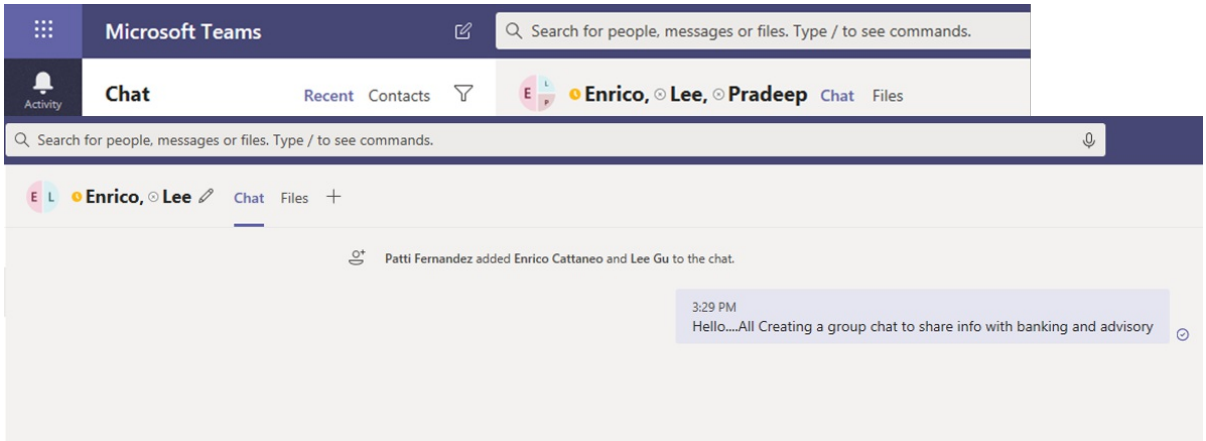


- **A new chat is requested** - Each time a new chat is requested between two or more users, the chat is evaluated to make sure that it isn't violating any information barrier policies. If the conversation violates an information barrier policy, then the conversation isn't initiated.

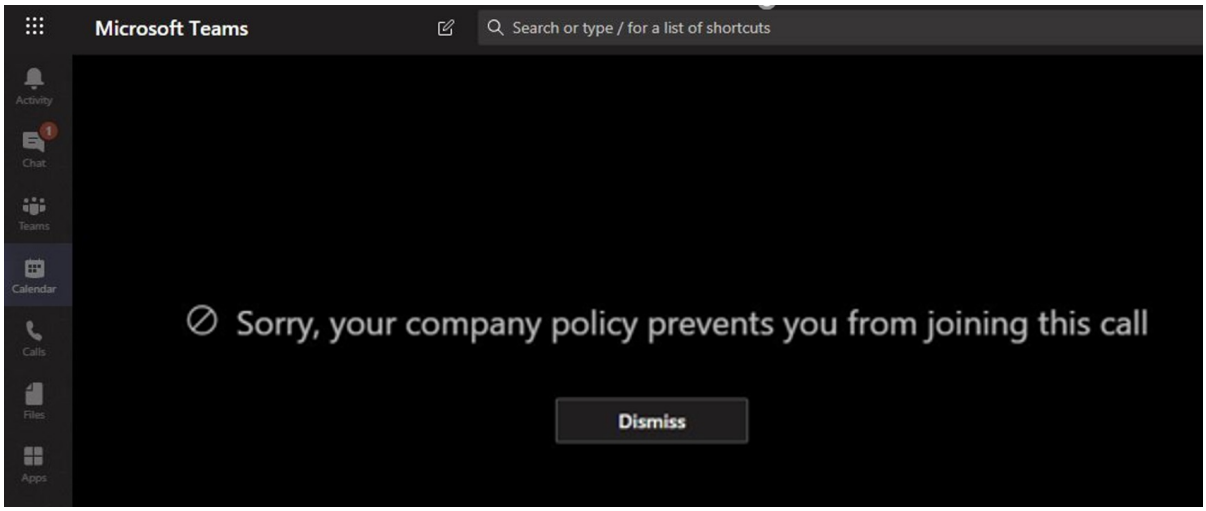
  Here's an example of a 1:1 chat.



  Here's an example of a group chat.

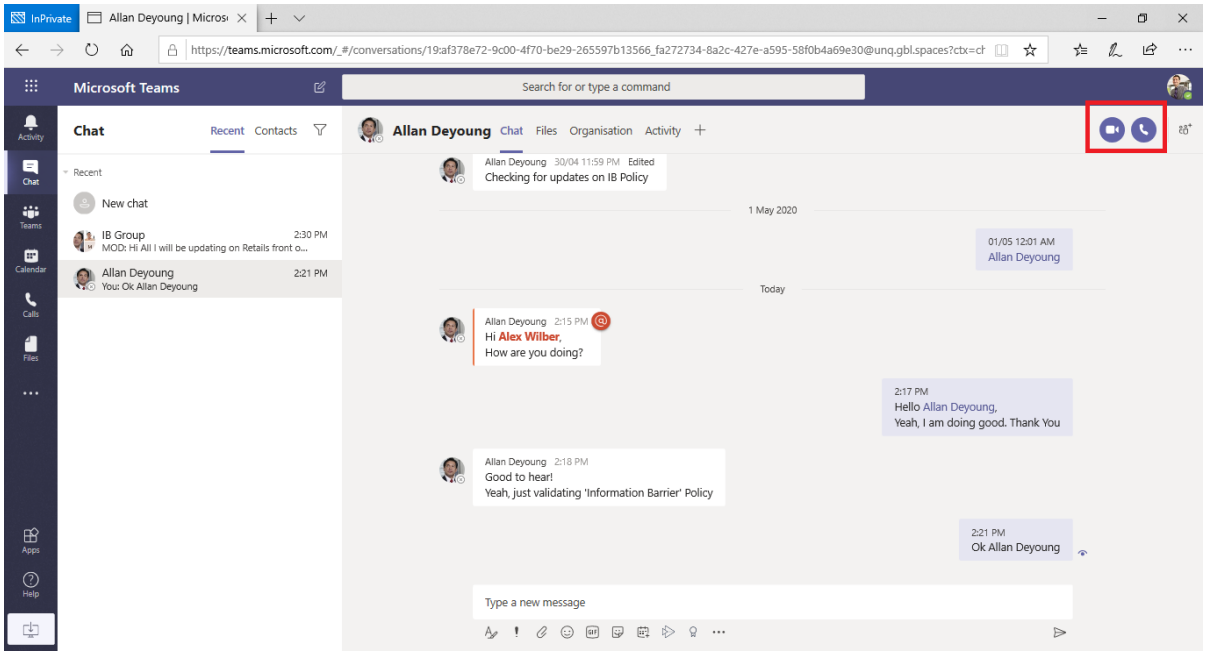


- **A user is invited to join a meeting** - When a user is invited to join a meeting, the user's policy is evaluated against the policies of other team members, and if there's a violation, the user will not be allowed to join the meeting.

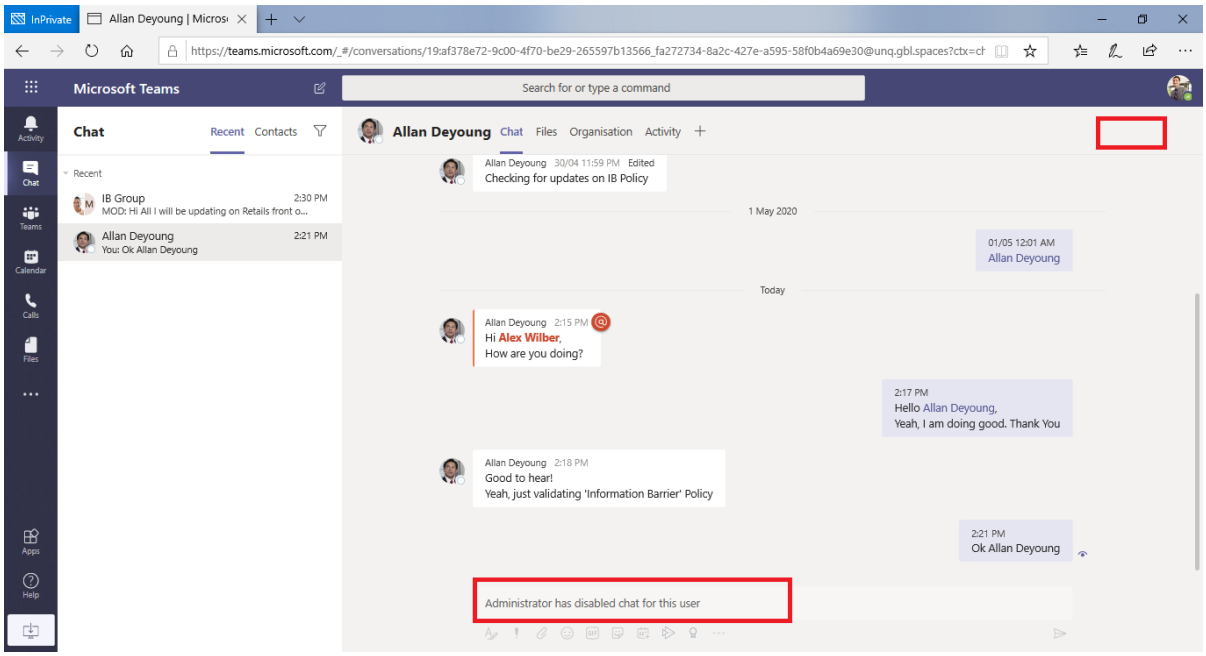


- **A screen is shared between two or more users** - When a screen is shared between two or more users, the screen share must be evaluated to make sure that it doesn't violate the information barrier policies of other users. If an information barrier policy is violated, the screen share won't be allowed.

  Here's an example of screen share before the policy is applied.



  Here's an example of screen share after the policy is applied. The screen share and call icons aren't visible.



- **A user places a phone call (VOIP) in Teams** - Any time a voice call is initiated by a user to another user or group of users, the call is evaluated to make sure that it doesn't violate the information barrier policies of other team members. If there is any violation, the voice call is blocked.

- **Guest users in Teams** - Information barrier policies apply to guest users in Teams too. If guest users need to be discoverable in your organization's global address list, see Manage guest access in Microsoft 365 Groups. Once guest users are discoverable, you can define information barrier policies.

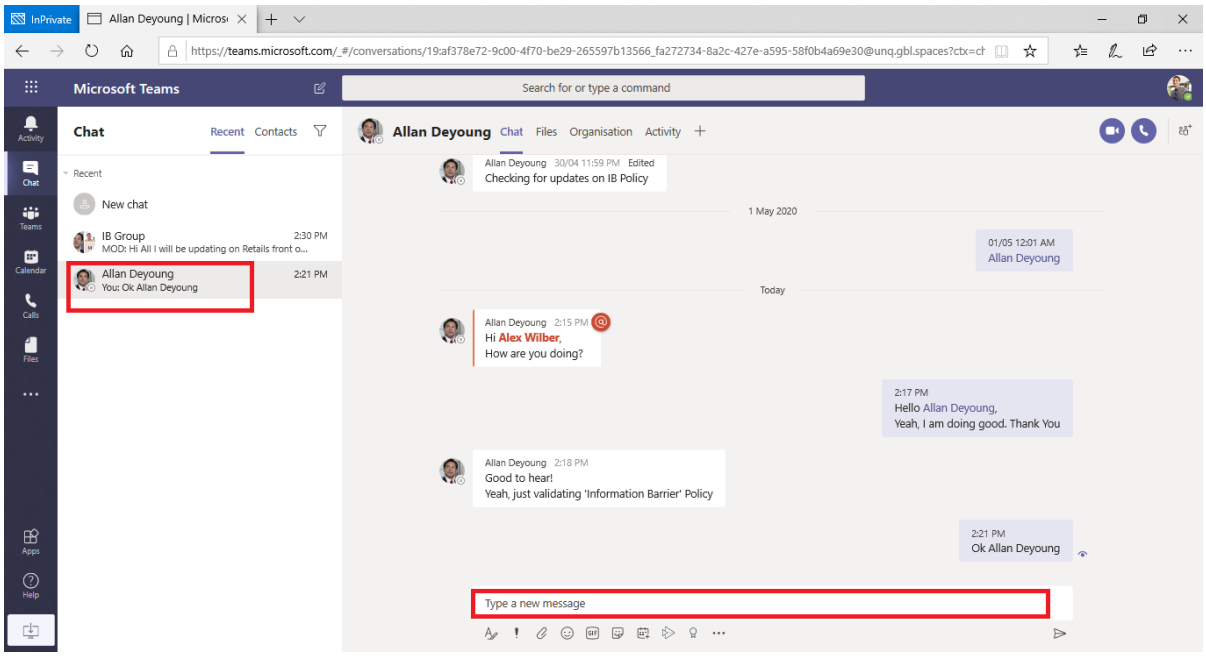
How policy changes impact existing chats

When the information barrier policy administrator makes changes to a policy, or a policy change kicks into effect because of a change to a user's profile (such as for a job change or a similar reason), the Information Barrier Policy Evaluation Service automatically searches the members to ensure that members of the Team are not violating any policies.

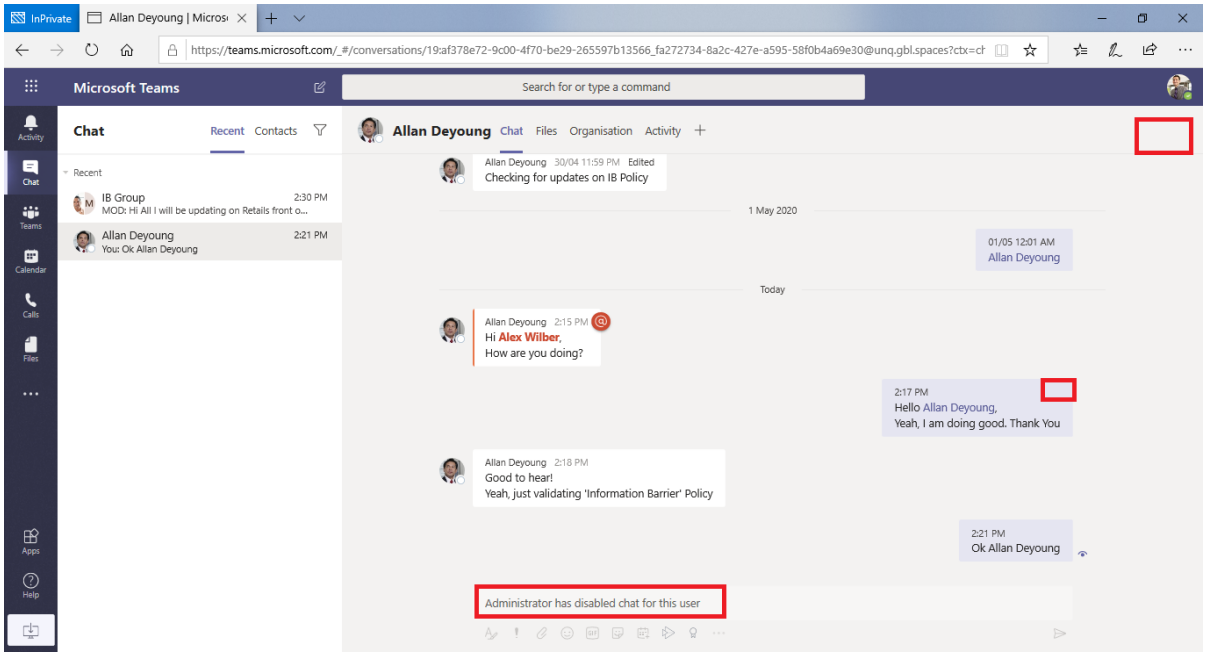
If there is an existing chat or other communication between users, and a new policy is set or an existing policy is changed, the service evaluates existing communications to make sure that the communications are still allowed to occur.

- **1:1 chat** - If communication between the two users is no longer allowed (if a policy blocking communication is applied to one or both users), further communication is blocked and the chat conversation will become read-only.

  Here's an example that shows the chat is visible.

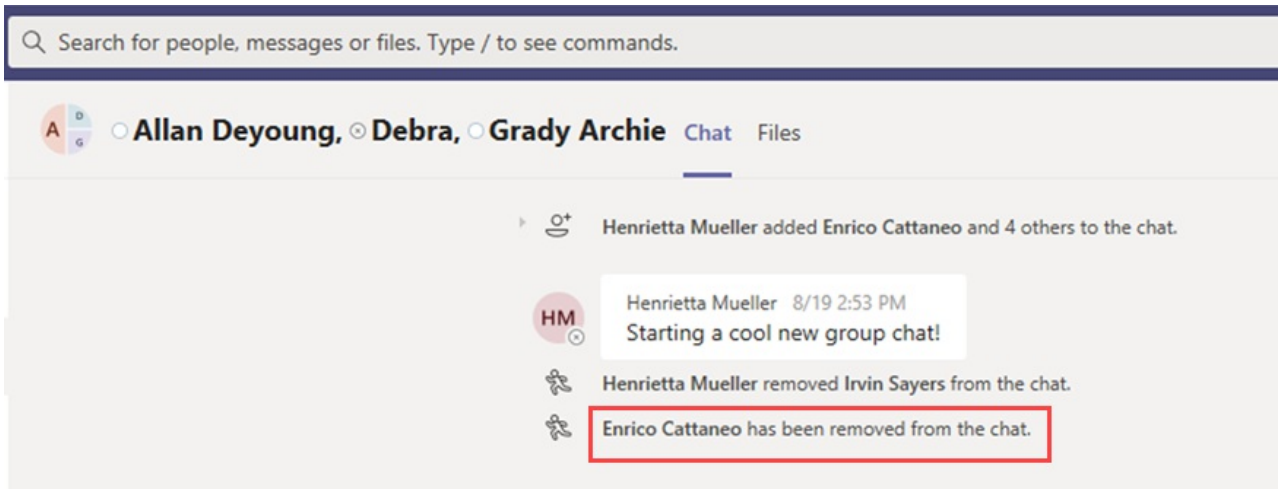


Here's an example that shows the chat is disabled.

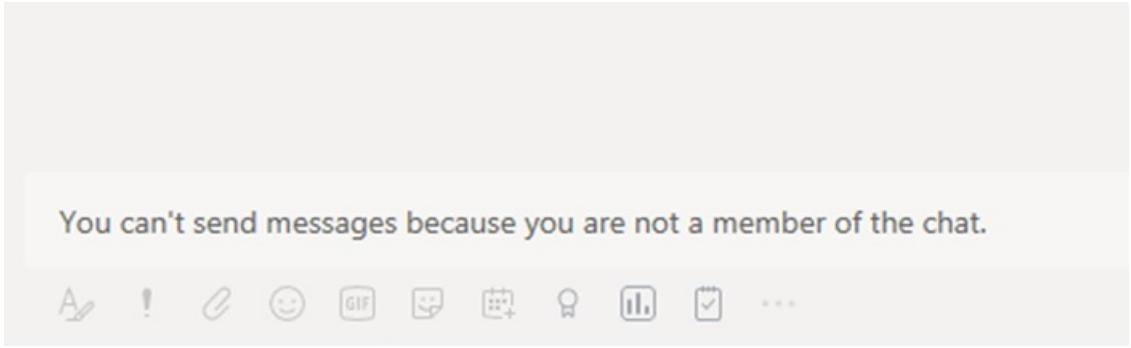


- **Group chat** - If communication from one user to the group is no longer allowed (for example, if a user changes jobs), the user along with the other users who violate the policy may be removed from group chat and further communication with the group will not be allowed. The user can still see old conversations (read-only), but won't be able to see or participate in any new conversations with the group. If the new or changed policy preventing communication is applied to more than one user, the users who are affected by the policy may be removed from group chat. They can still see old conversations.

In this example, Enrico moved to a different department within the organization and is removed from the group chat.



Enrico can no longer send messages to the group chat.

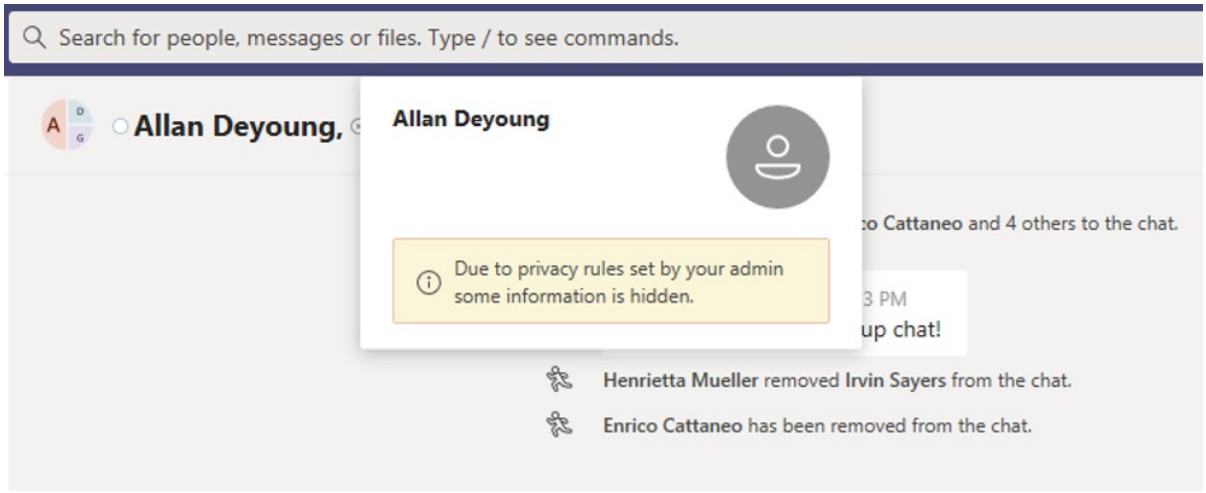


- **Team** - Any users who have been removed from the group are removed from the team and will not be able to see or participate in existing or new conversations.

Scenario: A user in an existing chat becomes blocked

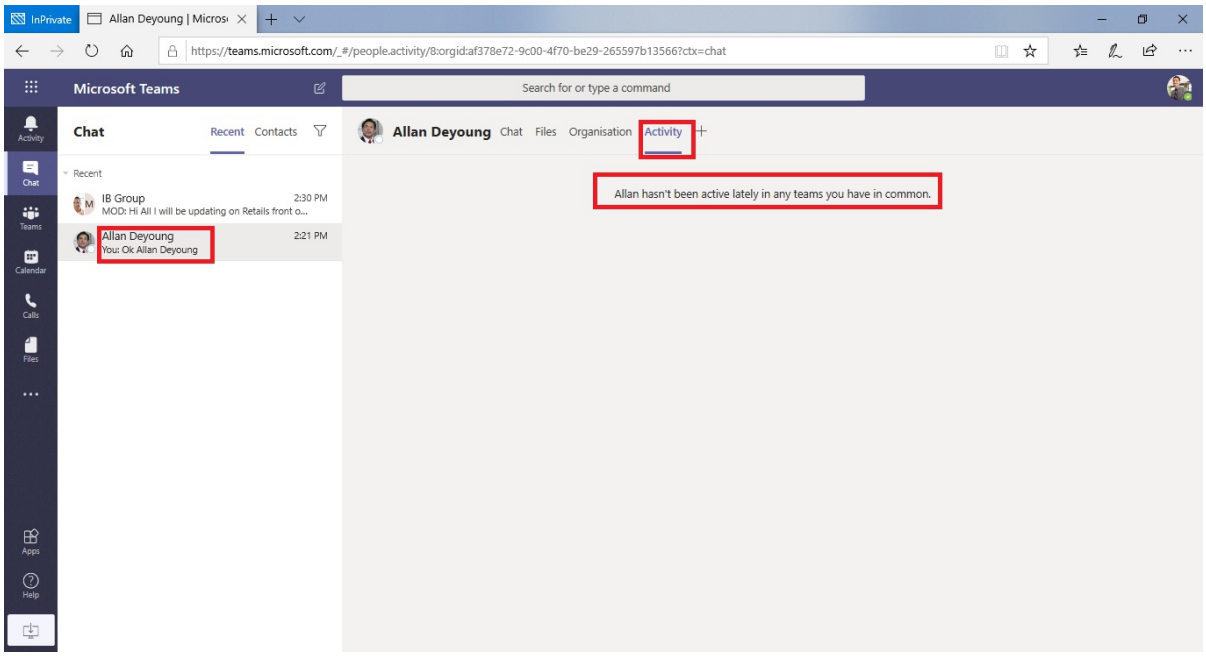
Currently, users experience the following scenarios if an information barrier policy blocks another user:

- **People tab** - A user cannot see blocked users on the **People** tab.
- **People Picker** - Blocked users will not be visible in the people picker.



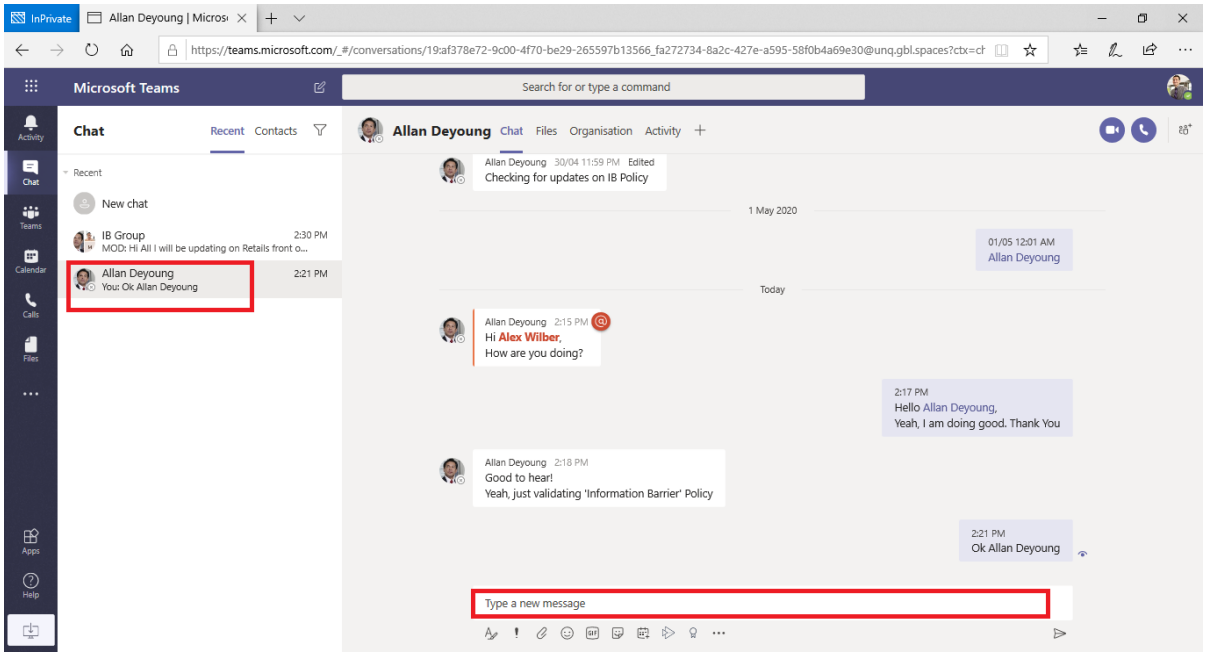
- **Activity tab** - If a user visits the **Activity** tab of a blocked user, no posts will appear. (The **Activity** tab displays channel posts only, and there would be no common channels between the two users.)

  Here's an example of the activity tab view that is blocked.

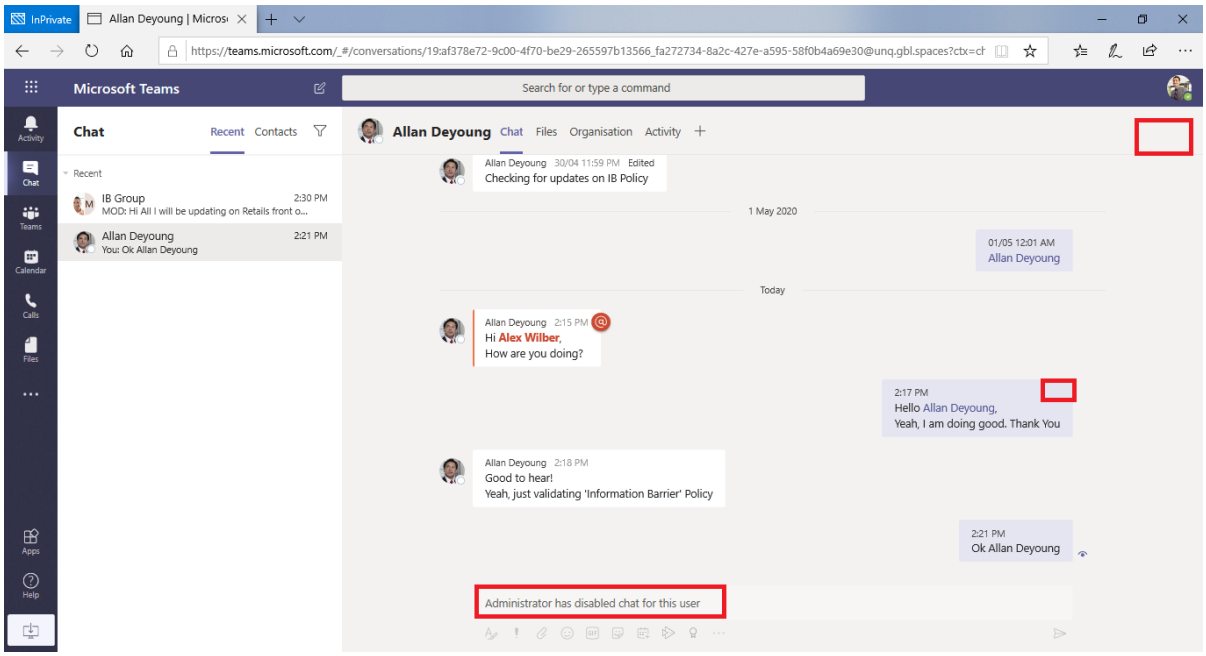


- **Org charts** - If a user accesses an org chart on which a blocked user appears, the blocked user won't appear on the org chart and an error message will appear instead.
- **People card** - If a user participates in a conversation and the user is subsequently blocked, other users will see an error message instead of the people card when they hover over the blocked user's name. Actions listed on the card (such as calling and chat) will be unavailable.
- **Suggested contacts** - Blocked users don't appear on the suggested contacts list (the initial contact list that appears for new users).
- **Chat contacts** - A user can see blocked users on the chats contact list, but the blocked users will be identified and the only action the user can perform is to delete them. The user can also click on them to view their past conversation.
- **Calls contacts** - A user can see blocked users on the calls contact list, but the blocked users will be identified and the only action the user can perform is to delete them.

  Here's an example of a blocked user in the calls contact list.



Here's an example of the chat being disabled for a user on the calls content list.



- **Skype to Teams migration** - During a Skype for Business to Teams migration, all users, even those blocked by information barrier policies, will be migrated to Teams and then will be handled as described above.

Teams policies and SharePoint sites

When a team is created, a SharePoint site is provisioned and associated with Microsoft Teams for the files experience. Information barrier policies are not honored on this SharePoint site and files by default. To enable Information Barrier policies, the administrator has already filled out a form, requesting that IB policies be enabled on SharePoint and OneDrive (see the *Prerequisite* section in Information barriers). If the Information Barrier policy is turned on in SharePoint and OneDrive, then the IB policies will work on SharePoint sites provisioned when a team is created with Microsoft Teams.

Example of IB policies on SharePoint site of a team: In Contoso Bank corporation, user 'Sesha@contosobank.onmicrosoft.com' belongs to Investment Banking segment and user 'Nikita@contosobank.onmicrosoft.com' belongs to segment Advisory. The organization's IB policy blocks communication and collaboration between these two segments. When user Sesha creates a team for Investment Banking segment, the team and the SharePoint site that backs it will be accessible only to Investment Banking segment users. User Nikita can't access that site even if she has the site link.

See the Information barriers article for more details.

Required licenses and permissions

For more information, including plans and pricing, see Licensing Guidance.

Known Issues

- **Users can't join ad-hoc meetings**: If IB policies are enabled, users are not allowed to join meetings IF the meeting roster size is more than the meeting attendance limits. The root cause is that IB checks rely on whether users can be added to a meeting chat roster and takes that signal to allow users to join meetings. Joining a meeting once will add that user to the roster, hence for recurring meetings, the roster fills up fast. Once it reaches the meeting attendance limits, no additional users are allowed to be added to the meeting chat roster. If IB is enabled for the tenant and the chat roster is full for a meeting, new users (those not already on the roster) are not allowed to join the meeting. But if IB is not enabled for the tenant and the meeting chat roster is full, new users (those not already on the roster) are allowed to join the meeting,

though they won't see the chat option in the meeting. A short term solution is to remove inactive members from the meeting chat roster to make space for new users. We will, however, be increasing the size of meeting chat rosters at a later date.

- **Users can't join channel meetings**: If IB policies are enabled, users are not allowed to join channel meetings IF they are not a member of the team. The root cause is that IB checks rely on whether users can be added to a meeting chat roster and takes that signal to allow users to join meetings. The chat thread in a channel meeting is available to Team/Channel members only, and non-members cannot see/access the chat thread. If IB is enabled for the tenant and a non-team member attempts to join a channel meeting, the user is not allowed to join the meeting. But if IB is not enabled for the tenant and a non-team member attempts to join a channel meeting, the user is allowed to join the meeting, however, they won't see the chat option in the meeting.

More information

- To learn more about information barriers, see Information barriers.
- To set up information barrier policies, see Define policies for information barriers.
- To edit or remove information barrier policies, see Edit (or remove) information barrier policies.

Retention policies in Microsoft Teams

12/5/2020 • 11 minutes to read • Edit Online

Retention policies help you to more effectively manage the information in your organization. Use retention policies to keep data that's needed to comply with your organization's internal policies, industry regulations, or legal needs, and to delete data that's considered a liability, that you're no longer required to keep, or has no legal or business value.

By default, Teams chat, channel, and files data are retained indefinitely, unless there is an attempt to delete the content via retention policies, user deletes, admin deletes etc. As an admin, you can set up Teams retention policies for chat and channel messages and decide proactively whether to retain the data, delete it, or retain it for a specific period of time and then delete it.

You create and manage retention policies for Teams and other workloads in the Microsoft 365 compliance center or by using the Security & Compliance Center PowerShell cmdlets. You can apply a Teams retention policy to your entire organization or to specific users and teams.

> **NOTE**
> We don't yet support configuration for retention of private channel messages. Retention of files shared in private channels is supported.

To learn more about retention policies for Microsoft 365 or Office 365, see Overview of retention policies.

What are retention policies for Teams

When you set up a retention policy for Teams or any other workload, you can set them up to:

- **Retain data**: Use a retention policy to ensure that your data is retained for a specified period of time, regardless of what happens in the user app. Data is retained for compliance reasons and is available for eDiscovery until the retention period expires, after which your policy indicates whether to do nothing or delete the data. For example, if you create a Teams retention policy to retain channel messages for 7 years, the messages are retained for eDiscovery for 7 years, even if users delete their messages in Teams.
- **Delete data**: Use a retention policy to delete data to ensure that it's not a liability for your organization. With a Teams retention policy, when you delete data, it's permanently deleted from all storage locations on the Teams service.

With retention policies for Teams, you can:

- Retain Teams chats and/or channel messages for a specified duration and then do nothing.
- Retain Teams chats and/or channel messages for a specified duration and then delete the data.
- Delete Teams chats and/or channel messages after a specified duration.

> **NOTE**
> Remember that in Teams, files that users share in private chats are stored in the OneDrive for Business account of the user who shared the file. And, files that team members upload to a channel conversation are stored in the team's SharePoint site. Therefore, to retain or delete files in Teams, create retention policies that apply to OneDrive for Business and SharePoint Online.

When data is subject to a retention policy, users can continue to work with it because the data is retained in place, in its original location. If a user edits or deletes data that's subject to the policy, a copy is saved to a secure location where it's retained while the policy is in effect.

The minimum licensing requirement for retention policies is Office 365 E3. To learn more about licensing, see Microsoft Teams service description.

How Teams retention policies work

Teams chats are stored in a hidden folder (Teamschat) in the mailbox of each user in the chat, and Teams channel messages are stored in a hidden folder (Teamschat) in the group mailbox for a team. Teams uses an Azure-powered chat service that also stores this data, and by default this service stores the data forever. With a Teams retention policy, when you delete data, the data is permanently deleted from both the Exchange mailboxes and the underlying chat service.

When you apply a **retention-hold** policy to Teams chats or channel messages, here's what happens:

- If a chat or channel message is edited or deleted by a user during the retention-hold period, the message is copied (if it was edited) or moved (if it was deleted) to the SubstrateHolds folder and stored there until the retention period expires. If the policy is configured to delete data when the retention period expires, messages are permanently deleted on the day the retention period expires.
- If a chat or channel message isn't deleted by a user during the **retention-hold** period, the message is moved to the SubstrateHolds folder within one day after the retention period expires. If the policy is configured to delete data when the retention period expires, the message is permanently deleted one day after it's moved to the folder.

When you apply a **retention-delete** policy to Teams chats and channel messages, here's what happens:

- When a chat or channel message expires i.e. age of message is more than allowed by **retention-delete** policy, a back-end service, identifies expired messages and starts deleting them in the backend storage (user or group mailbox).
- Once a message is deleted in back-end storage, a process is triggered to delete the same message in the Azure-powered chat service and user's Teams app. For the messages to be deleted in Teams app, the app needs to be connected to internet and to be in idle state (no user activity), so that the deletion process would not interfere in user experience. Since a user might have multiple devices, which might be in different states, retention deletes would not sync up with those devices at exactly same time.
- Once the deletion of messages in backend storage is complete, those messages will stop showing up in compliance search reports such as eDiscovery.

> **NOTE**
> The same flow works for Skype for Business Online and Teams interop chats. When a Skype for Business Online chat comes into Teams, it becomes a message in a Teams chat thread and is ingested into the appropriate mailbox. Teams retention policies will delete these messages from the Teams thread. However, if conversation history is turned on for Skype for Business Online and from the Skype for Business Online client side those are being saved into a mailbox, that chat data isn't handled by a Teams retention policy.

> **NOTE**
> The deletion of messages is permanent and irreversible.

Retention policies in Teams are based on the date the chat or channel messages were created and are retroactive. In other words, if you create a retention policy to delete data older than 90 days, Teams data created more than 90

days ago is deleted.

It's possible that a retention policy that's applied to SharePoint Online or OneDrive for Business could delete a file that's referenced in a Teams chat or channel message before those messages get deleted. In this scenario, the file will still show up in the Teams message, but when users click the file, they'll get a "File not found" error. This can also happen in the absence of a policy, if someone manually deletes a file from SharePoint Online or OneDrive for Business.

Considerations and limitations

Here's some considerations and limitations to be aware of when working with Teams retention policies:

- Teams requires a retention policy that's separate from other workloads. In other words, you have to create specific retention policies for Teams chats and/or channel messages. For this reason, you can't include Teams in org-wide retention policies.
- Private channel messages aren't supported. At this time, retention policies for Teams only apply to standard channel messages.
- Teams doesn't support advanced retention settings, such as the ability to apply a policy to content that contains keywords or sensitive information. Currently, retention policies in Teams apply to all chat and/or channel message content.
- A Teams retention policy will trigger a process to delete chat and channel messages when those messages expire (based on message creation date). However, depending on service load, it may take up-to seven days to permanently delete these messages from backend storage and Teams app. Also, these messages will be searchable with compliance tools (eDiscovery, end user search) till they are permanently deleted from backend storage.

Multiple retention policies and the principles of retention

If you set up multiple Teams retention policies with varying durations, the principles of retention policies apply. Here's an overview of what takes precedence:

- Preservation always wins over deletion
- Longest preservation period always wins
- Explicit inclusion wins over implicit inclusion in terms of locations
- Shortest deletion period wins

When to use retention policies for Teams

In many cases, organizations consider private chat data as more of a liability than channel messages, which are typically more project-related conversations.

You can set up separate retention policies for private chats (1:1 or 1:many chats) and channel messages. You can also configure unique policies that apply to specific users or teams in your organization. For Teams chats, you can select which users the policy applies to. For Teams channel messages, you can select which teams the policy applies to.

For example, for channel messages, you can apply a one-year deletion policy to specific teams in your organization and apply a three-year deletion policy to all other teams.

Manage retention policies for Teams

Using the Security & Compliance Center

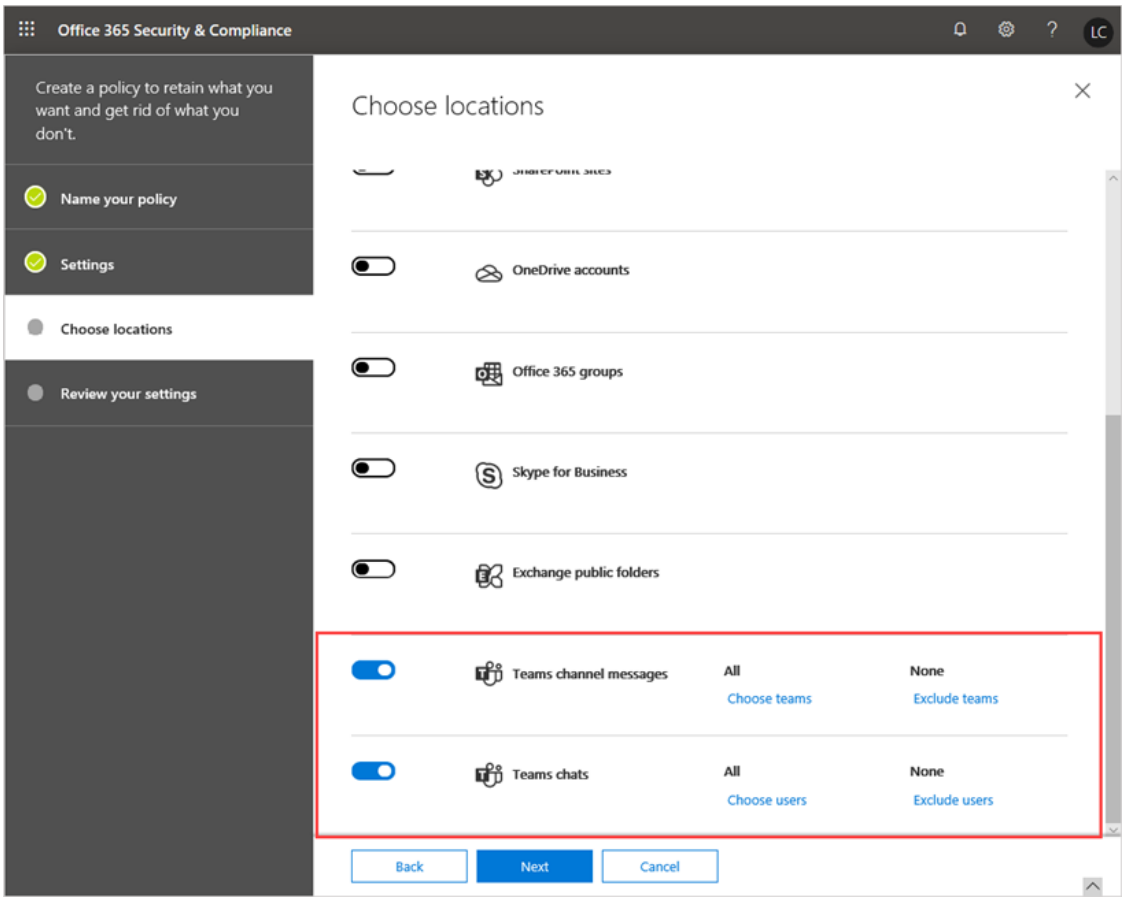
Create a retention policy

To create a retention policy for Teams chats and channel messages, do the following:

1. In the left navigation of the Security & Compliance Center, go to **Information governance** > **Retention**.
2. Select **Create**.
3. On the **Name your policy** page, enter a name and description for your policy, and then click **Next**.
4. On the **Settings** page, specify whether you want to retain data, delete it, or both, the retention period, and then click **Next**.
5. On the **Choose locations** page, do the following, and then click **Next**:
   - To apply the policy to channel messages, turn on **Teams channel messages**. If you want to apply the policy to specific teams in your organization, select **Choose teams**, and then select the teams that you want.
   - To apply the policy to chats, turn on **Teams chats**. If you want to apply the policy to specific users in your organization, select **Choose users**, and then select the users that you want.

     NOTE

     When you turn on **Teams channel messages** and/or **Teams chats**, all other locations are automatically turned off. A Teams retention policy can only include Teams locations.



IMPORTANT

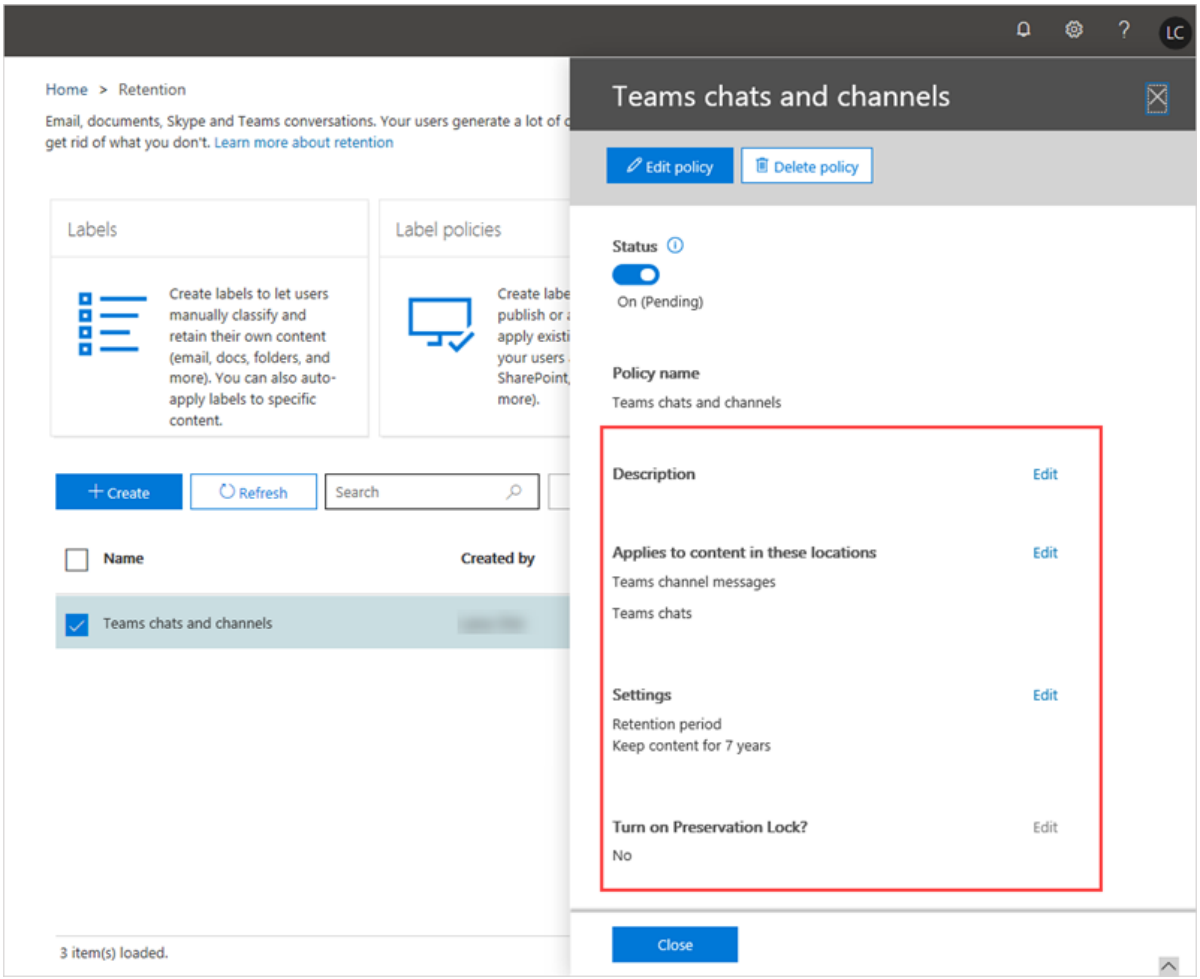
Teams chats and channel messages aren't affected by retention policies applied to user or group mailboxes in the **Exchange email** or **Microsoft 365 groups** locations. Even though Teams chats and channel messages are stored in Exchange, they're only affected by retention policies applied to the Teams locations.

6. Review your settings, and then when you're ready, select **Create this policy**.

Edit a retention policy

To edit a Teams retention policy, do the following:

1. In the left navigation of the Security & Compliance Center, go to **Information governance** > **Retention**.
2. In the list of retention policies, select the check box next to the retention policy you want to edit.
3. Select **Edit** next to what you want to edit, make your changes, click **Save**, and then click **Close**.



WARNING

If you have configured specific teams or specific users to include for Teams channel messages or Teams chats, and edit these to remove the last one for the location, the configuration for that location reverts to **All**. Make sure this is the configuration that you intend before you save the policy.

For example, if you have specified one Teams chat user to include in your retention policy that's configured to delete data, and then edit the policy to remove this user, by default all users will then be subject to the retention policy that permanently deletes their Teams chat messages. The same applies to includes for Teams channel messages.

In this scenario, toggle the location off if you don't want the **All** setting for the Teams channel messages or Teams chat messages to be subject to the retention policy. Alternatively, specify excludes to be exempt from the policy.

Delete a retention policy

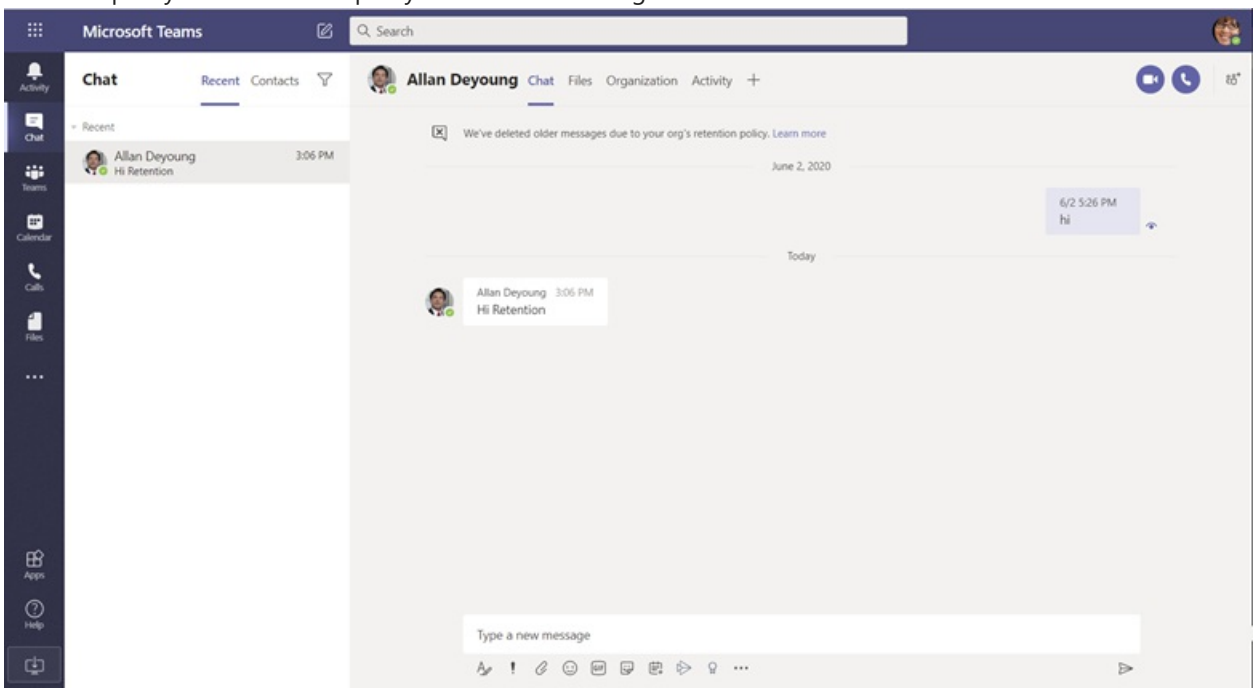
To delete a Teams retention policy, do the following:

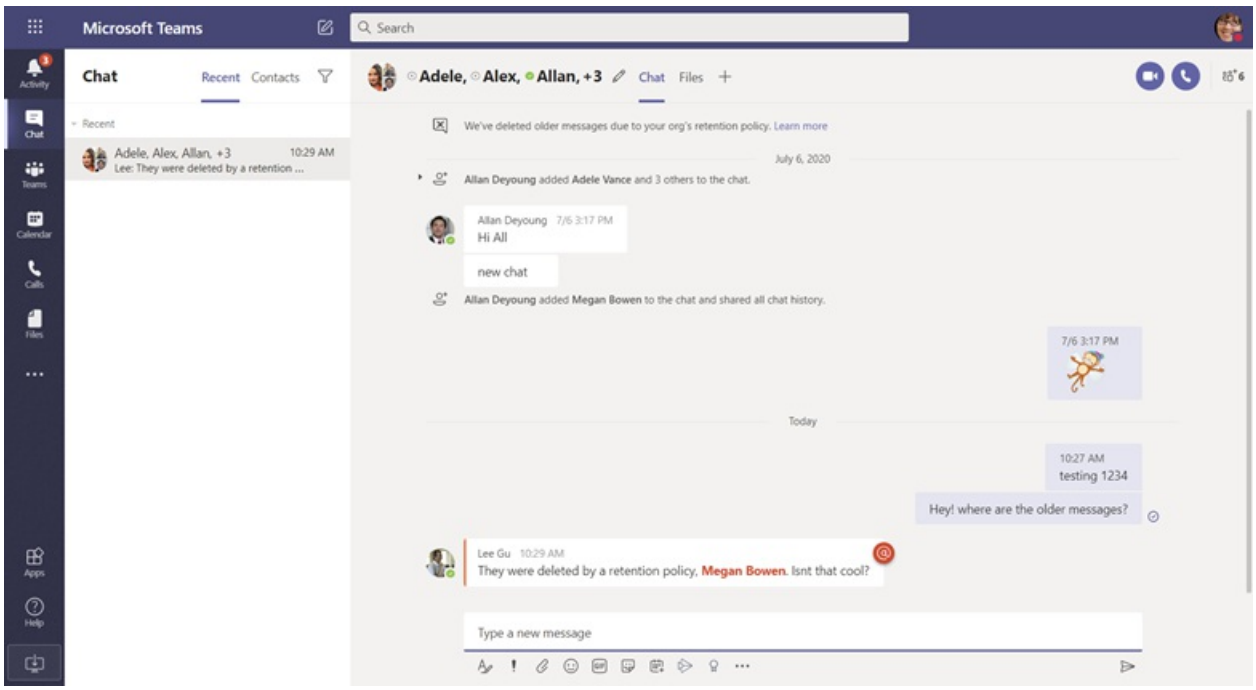
1. In the left navigation of the Security & Compliance Center, go to **Information governance** > **Retention**.
2. In the list of retention policies, select the check box next to the retention policy you want to delete.
3. Select **Delete policy**.

End user experience

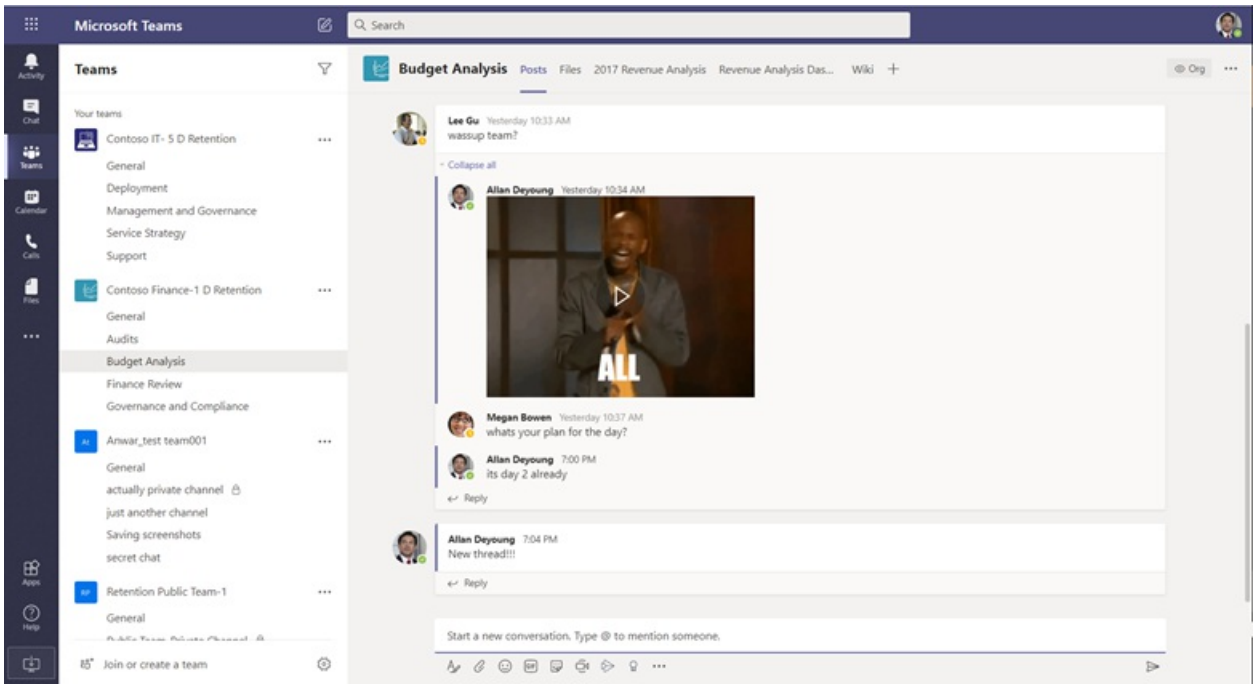
For private chats (1:1 chats) or group chats, the end users will see that chats older than the retention policy

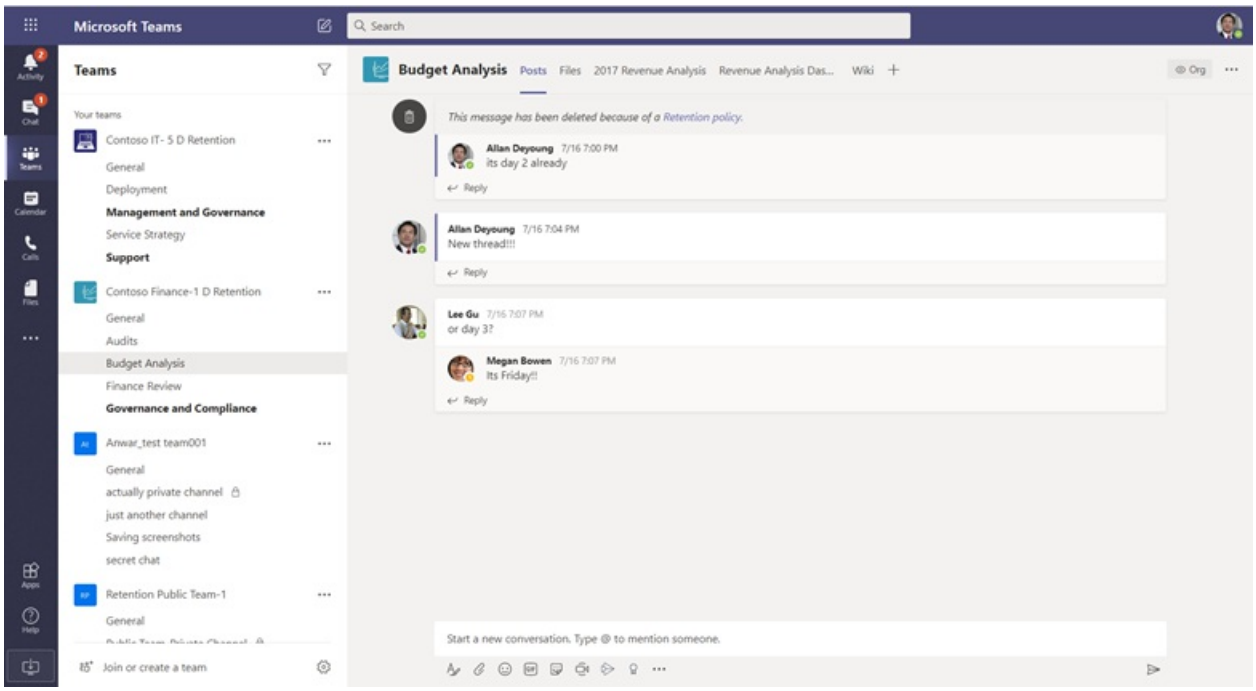
configuration are deleted and a control message stating" We've deleted older messages due to your org's retention policy" is shown on top of yet undeleted messages.





For Channel messages, the end users (channel members) will see the deleted messages disappear from view after messages expire. If the deleted message was a parent message of a threaded conversation, then, in place of parent message, a message stating "This message has been deleted because of a Retention Policy" will be displayed.





> **NOTE**
>
> End user messaging is not user or admin modifiable at this time.

Using PowerShell

To create and manage Teams retention policies by using Security & Compliance Center PowerShell, use the following cmdlets:

POLICY	RULE
New-RetentionCompliancePolicy	New-RetentionComplianceRule
Get-RetentionCompliancePolicy	Get-RetentionComplianceRule
Set-RetentionCompliancePolicy	Set-RetentionComplianceRule

POLICY	RULE
Remove-RetentionCompliancePolicy	Remove-RetentionComplianceRule

Known issues

The following are known issues for retention policies in Teams that are being tracked and investigated.

- Under **Choose teams** in the **Teams channel messages** location row, you may see Microsoft 365 Groups that aren't also Teams. This will be addressed in the future.
- Under **Choose users** in the **Teams chats** location row, you may see guests and non-mailbox users. Retention policies aren't meant to be set for guests, and we're working to remove these from the list.
- Retention processing jobs run daily, but the latency is known to have run upto 7 days, in some cases. As a result, it's possible that, if you have a Teams retention policy to delete items older than 60 days, these items could persist for up to 67 days. This isn't a new situation - it follows the Exchange model. Of course, in most cases, there's no delay.

Related topics

- Overview of retention policies

Communication compliance with Microsoft Teams

9/30/2020 • 2 minutes to read • Edit Online

Communication compliance is an insider risk solution in Microsoft 365 that helps minimize communication risks by helping you detect, capture, and act on inappropriate messages in your organization.

For Microsoft Teams, communication compliance helps identify the following types of inappropriate content in Teams channels or in 1:1 and group chats:

- Offensive, profane, and harassing language
- Adult, racy, and gory images
- Sharing of sensitive information

For more information on communication compliance and how to configure policies for your organization, see Communication compliance in Microsoft 365.

How to use communication compliance in Microsoft Teams

Communication compliance and Microsoft Teams are tightly integrated and can help minimize communication risks in your organization. After you've configured your first communication compliance policies, you can actively manage inappropriate Microsoft Teams messages and content that is automatically flagged in alerts.

Getting started

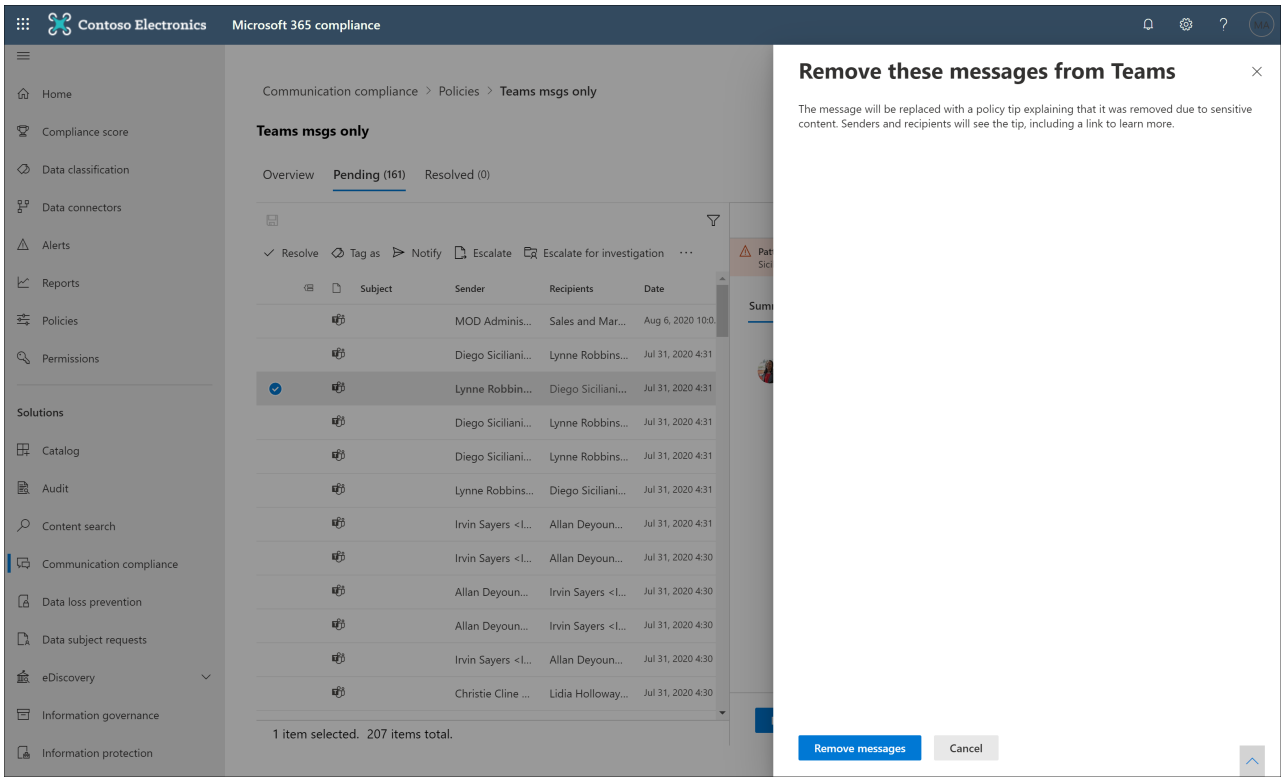
Getting started with communication compliance in Microsoft Teams begins with planning and creating pre-defined or custom policies to identify inappropriate user activities in Teams channels or in 1:1 and groups. Keep in mind that you'll need to configure some permissions and basic prerequisites as part of the configuration process.

Teams administrators can configure communication compliance policies at the following levels:

- **User level**: Policies at this level apply to an individual Teams user or may be applied to all Teams users in your organization. These policies cover messages that these users may send in 1:1 or group chats. Chat communications for the users are automatically monitored across all Microsoft Teams where the users are a member.
- **Teams level**: Policies at this level apply to a Microsoft Team channel. These policies cover messages sent in the Teams channel only.

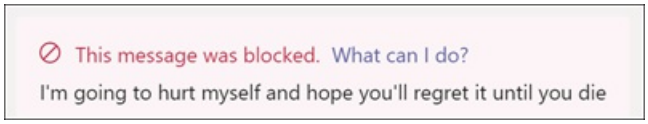
Act on inappropriate messages in Microsoft Teams

After you have configured your policies and have received communication compliance alerts for Microsoft Teams messages, it's time for compliance reviewers in your organization to take action on these messages. Reviewers can help safeguard your organization by reviewing communication compliance alerts and removing flagged messages from view in Microsoft Teams.

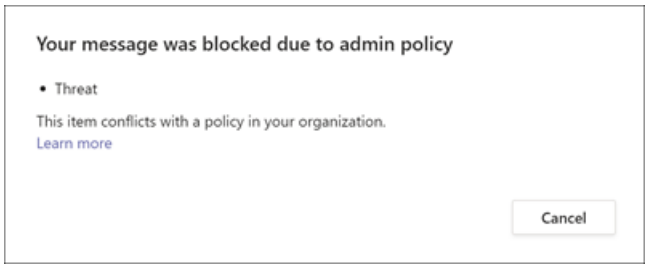


Removed messages and content are replaced with notifications for viewers explaining that the message or content has been removed and what policy is applicable to the removal. The sender of the removed message or content is also notified of the removal status and provided with original message content for context relating to its removal. The sender can also view the specific policy condition that applies to the message removal.

Example of policy tip seen by sender:



Example of policy condition notification seen by the sender:



Example of policy tip seen by recipient:



Introduction to Teams policy-based recording for callings & meetings

12/5/2020 • 6 minutes to read • Edit Online

Policy-based recording enables organizations that adopt Microsoft Teams for calling and meetings to stipulate, using an administrative policy, when calls and online meetings should be automatically recorded and captured for subsequent processing and retention as required by relevant corporate or regulatory policy.

Teams has been enhanced to support integration of third-party recording solutions, including the platform functionality, user experiences, and administrative interfaces needed to provide an end-to-end solution for configuring, managing, recording, storing, and analyzing Teams communications. This includes communications platform APIs and events for recording, which provides:

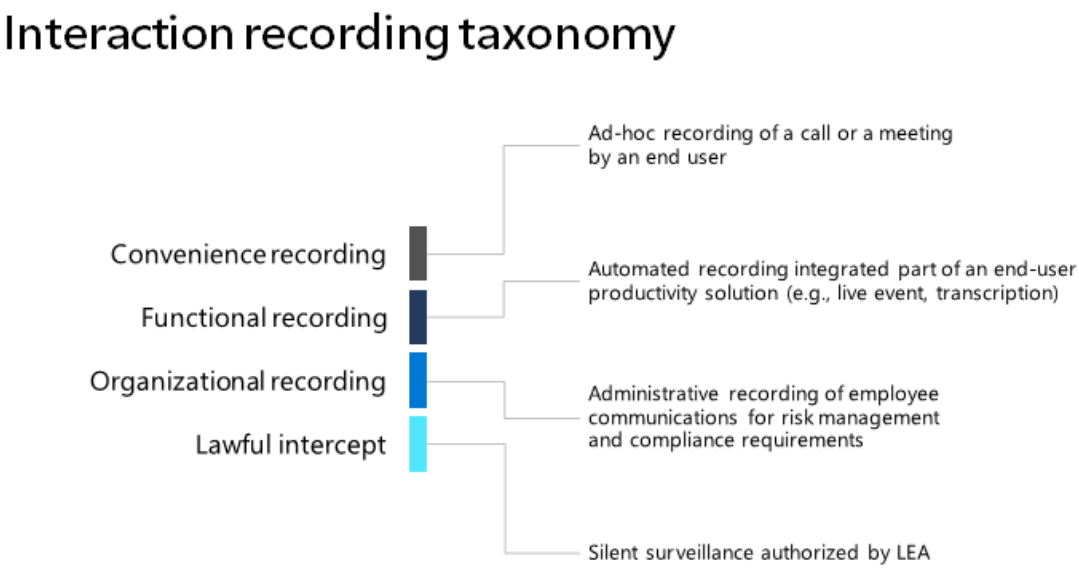
- Seamless, high-quality media capture across devices and all supported endpoints for audio, video, screen share, and chat.
- Support for interaction capture between Teams users and supported calling endpoints (Teams, Teams Mobile, Skype for Business, PSTN)
- New administrative policies for compliance recording, including integration with existing Teams administrative calling and meeting tools and policies

Compliance Recording can be enabled on Microsoft 365 A3/A5/E3/E5/Business Premium and Office 365 A3/A5/E3/E5 users.

The compliance recording solution integration capabilities were also reviewed at Ignite 2019 in the Compliance Recording and Microsoft Teams session.

Teams interaction recording overview

Interaction recording use cases can effectively be separated into four primary categories of recording functionality – Convenience, Functional, Organizational, and Lawful Intercept, as shown in the image:



Each of the categories entails different requirements for how recordings are initiated, what is recorded, where recordings are stored, who is notified, who controls access, and how retention is handled.

TYPE	CONVENIENCE	FUNCTIONAL	ORG - GENERAL	ORG - REGULATED	LAWFUL INTERCEPT
Initiator	User	App/Solution	Admin (system)	Admin (system)	LEA
Target	Per-call / meeting	Per-call / meeting	Per-call / meeting	Per-user	Per-endpoint / DID
Storage owner	User	App	Admin	Compliance	LEA
Notification required?	Yes	Yes	Yes	Yes	No
Access Owner	User	App	Admin	Compliance	LEA
Retention Policy?	Optional	Yes	Yes	Yes	Yes

Teams provides various capabilities for convenient and functional recording for meetings and live events. Organizational recording means enabling organizations adopting Teams for calling and meetings to stipulate, by way of an administrative policy, when calls and online meetings should be automatically recorded and captured for subsequent processing and retention as required by relevant corporate or regulatory policy. Users under this policy will be aware that their digital interactions with Teams are being recorded but will not be able to disable the recording and will not have access to the recording once the interaction is complete. The recording becomes part of the organizational archive available to compliance and legal personnel for eDiscovery, legal hold, and other corporate retention uses.

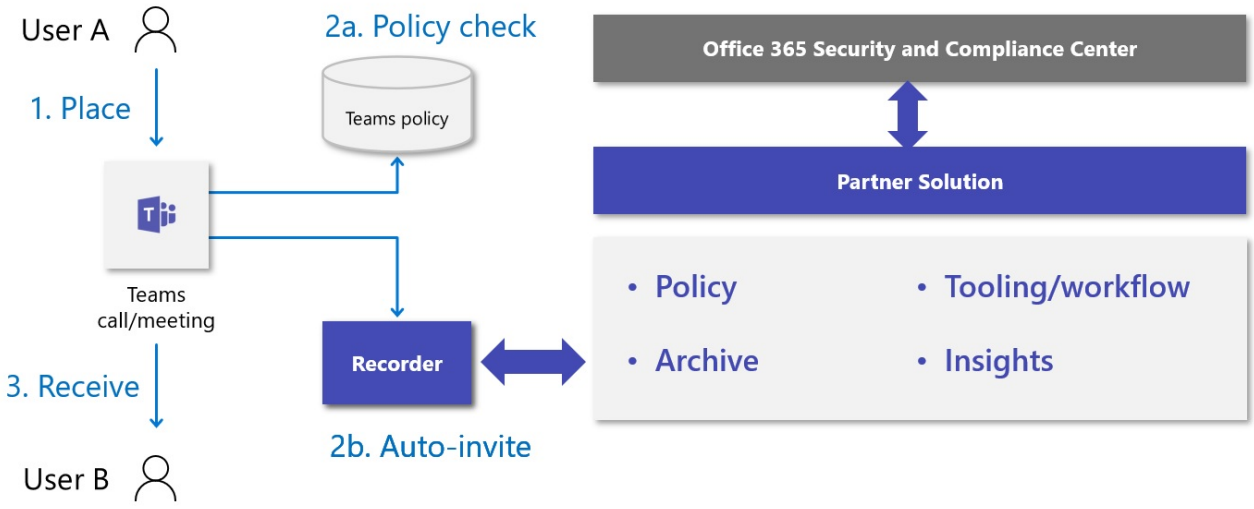
Example user needs

PERSONA	NEEDS
Recorded users	• Be notified when recording is in progress. • Be informed when policy and/or recorder error is causing changes in calling behavior.
Communications admin	• Understand why and how to apply / enforce recording policies to Teams users / endpoints. • Configure and maintain Teams recording policies for the organization. • Monitor and troubleshoot recording-related issues with Teams calls and meetings. • Support internal compliance officer with operational analytics on usage, quality, and reliability.

PERSONA	NEEDS
Compliance officer	• Collect all Teams communications in the manner required to meet compliance obligations in appropriate regional boundaries. • Search for interactions based on communication-related metadata or interaction content. Common examples include: ◦ **Metadata** - Participants, time, direction, dialed number, origin number, Custom business data ◦ **Content** – Transcription, sentiment, phonetics, related interactions • Analyze and interact with collected communications, including the ability to monitor interactions as they are being collected. • Ensure security of collected communications and prevent tampering at all stages.

Solution architecture overview

Compliance recording solutions are integrated with Teams as shown in the following diagram:



Recorder

The core component of the compliance recording solution is the recorder. Recorders are built as scalable Azure-based services (bots) that leverage Microsoft's communications platform and register as applications with Microsoft Graph. The recorder provides the direct interaction with the Teams calls and meetings communications platform APIs and provides the endpoint for media ingestion.

A sample compliance recorder application is available that shows how to configure the bot, create the app instance and assign the compliance policies. The sample also has examples on API usage for recording specific interactions such as handling incoming call routing, changing recording states, and removing the user who is being recorded. Graph documentation on the specific APIs can be found here for updateRecordingStatus and incomingContext.

The exact implementation of the recorder service will vary by partner but must be designed to support multiple recorders in order to achieve high availability and geographical distribution of deployment to reduce latency from Teams to the recorder. In addition, it is expected that Recorders themselves be designed with resiliency and

redundancy in mind.

Partners must confirm the minimum required release version of the Microsoft Graph communications APIs and SDKs with Microsoft before submitting their solution for certification to ensure that all requirements of compliance recording integration are supported.

Two specific requirements that are fundamental for compliance recording scenario are:

- Recorder bot must be deployed in Azure
- Recorder bot must run on a Windows VM in Azure

The Azure and Windows VM requirements only apply to the Teams Bot component, which means that a partner may implement the rest of the platform of their choice provided they can meet the relevant performance and functional requirements for compliance recording.

Compliance recording policy assignment and provisioning

IT Administrators can determine which users are to be recorded and which recorder will be used for each user, by creating and assigning compliance recording policies. Recorders are automatically invited to participate in conversations based on the configuration of these policies when a communication interaction takes place. Compliance recording policies are managed using Microsoft Powershell and can be applied at the tenant, per-user, and security group level for each organization. You can find more information on Microsoft Docs for Meeting policies, calling policies and group policies.

1. Create an application instance in your tenant.

```
PS C:\> New-CsOnlineApplicationInstance -UserPrincipalName cr.instance@contoso.onmicrosoft.com -
DisplayName ComplianceRecordingBotInstance -ApplicationId fcc88ff5-a42d-49cf-b3d8-f2e1f609d511

RunspaceId        : 4c13efa6-77bc-42db-b5bf-bdd62cdfc5df
ObjectId          : 5069aae5-c451-4983-9e57-9455ced220b7
TenantId          : 5b943d7c-5e14-474b-8237-5022eb8e0dc9
UserPrincipalName : cr.instance@contoso.onmicrosoft.com
ApplicationId     : fcc88ff5-a42d-49cf-b3d8-f2e1f609d511
DisplayName       : ComplianceRecordingBotInstance
PhoneNumber       :
```

```
PS C:\> Sync-CsOnlineApplicationInstance -ObjectId 5069aae5-c451-4983-9e57-9455ced220b7
```

2. Create a Compliance Recording policy.

```
PS C:\> New-CsTeamsComplianceRecordingPolicy -Identity TestComplianceRecordingPolicy -Enabled $true -
Description "Test policy created by tenant admin"

Identity                         : Global
ComplianceRecordingApplications : {}
Enabled                          : True
WarnUserOnRemoval                : True
Description                      : Test policy created by tenant admin
```

```
PS C:\> Set-CsTeamsComplianceRecordingPolicy -Identity TestComplianceRecordingPolicy `
-ComplianceRecordingApplications @(New-CsTeamsComplianceRecordingApplication -Id 5069aae5-c451-4983-
9e57-9455ced220b7 -Parent TestComplianceRecordingPolicy)
```

Set-CsTeamsComplianceRecordingPolicy

3. Assign the Compliance Recording policy to a user.

```
PS C:\> Grant-CsTeamsComplianceRecordingPolicy -Identity testuser@contoso.onmicrosoft.com -PolicyName
TestComplianceRecordingPolicy
```

Grant-CsTeamsComplianceRecordingPolicy

```
PS C:\> Get-CsOnlineUser testuser@contoso.onmicrosoft.com | select SipAddress, TenantId,
TeamsComplianceRecordingPolicy | fl

UserPrincipalName              : testuser@contoso.onmicrosoft.com
TenantId                       : 5b943d7c-5e14-474b-8237-5022eb8e0dc9
TeamsComplianceRecordingPolicy : TestComplianceRecordingPolicy
```

User experiences

Support for notifications is enabled using the Teams client experiences. The experiences can be either visual or audio.

Teams clients - visual notice

- Desktop/web
- Mobile (iOS/Android)
- Teams phones
- Teams rooms

Other endpoints - audio notice

- SIP phones
- Skype for Business
- Audio conferencing
- PSTN callers

Compliance recording for Teams certification programs

In addition to publishing publicly-available APIs allowing partners to develop and integrate CCaaS solutions with Teams, we have developed the compliance recording for Microsoft Teams certification program to provide customers with the assurance that each participating partner's solution has been tested and verified to provide the quality, compatibility and reliability they expect from Microsoft solutions.

The following partners have certified their solution for Microsoft Teams.

PARTNER	SOLUTION WEBSITE
NICE	https://www.niceactimize.com/compliance/ms-teams-recording.html

The following partners are in the process of certifying their solution for Microsoft Teams.

PARTNER	SOLUTION WEBSITE
ASC Technologies	https://www.asctechnologies.com/english/ASC_Recording_Insights_Compliance_Recording_for_Microsoft_Teams.html

PARTNER	SOLUTION WEBSITE
AudioCodes	https://www.audiocodes.com/solutions-products/products/products-for-microsoft-365/smarttap-360-recording
CallCabinet	https://www.callcabinet.com/compliance-microsoft-teams-call-recording
Dubber	https://www.dubber.net/call-recording/
Landis Technologies	https://landistechnologies.com/
Luware	https://luware.com/en/solution/microsoft-teams-recording/
Numonix	https://numonix.cloud
Oak Innovation	https://www.oakinnovate.com/call-recording
Red Box	https://www.redboxvoice.com/compliance-recording-for-microsoft-teams
Verint	https://www.verba.com/solutions/microsoft-teams-recording

This list will be updated as more partners join and meet the certification criteria.

Next steps

If you are a vendor seeking to join the certification program, please mail Teamscategorypartner@microsoft.com.

Conduct an eDiscovery investigation of content in Microsoft Teams

12/5/2020 • 12 minutes to read • Edit Online

Large Enterprises are often exposed to high penalty legal proceedings that demand submission of all Electronically Stored Information (ESI). Microsoft Teams content can be searched and used during eDiscovery investigations.

Overview

All Microsoft Teams 1:1 or group chats are journaled through to the respective users' mailboxes. All standard channel messages are journaled through to the group mailbox representing the team. Files uploaded in standard channels are covered under the eDiscovery functionality for SharePoint Online and OneDrive for Business.

eDiscovery of messages and files in private channels works differently than in standard channels. To learn more, see eDiscovery of private channels.

Not all Teams content is eDiscoverable. The following table shows the content types that can be located through eDiscovery.

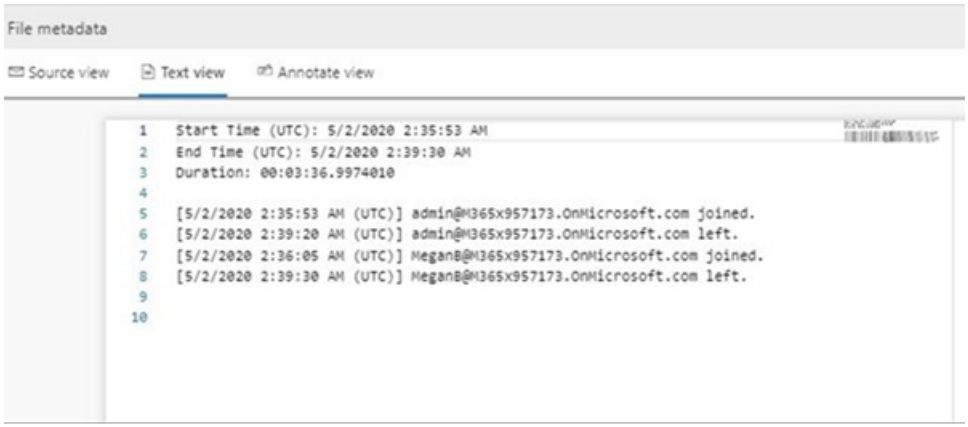
CONTENT TYPE	EDISCOVERABLE	NOTES
Teams chat messages	Yes	
Private channel messages	Yes	
Name of channel	No	
Meeting IM conversations	Yes	
Meeting metadata[1]	Yes	
Edited messages	Yes	If the user is on hold, previous versions of edited messages are preserved.
Emojis, GIFs, stickers	Yes	
Code snippets	No	
Chat links	Yes	
Reactions (likes, hearts, and so on)	No	
Inline images	Yes	
Tables	Yes	
Subject	Yes	

CONTENT TYPE	EDISCOVERABLE	NOTES
Quotes	Yes	Quoted content is searchable. However, search results don't indicate that the content was quoted.
Audio recordings	No	

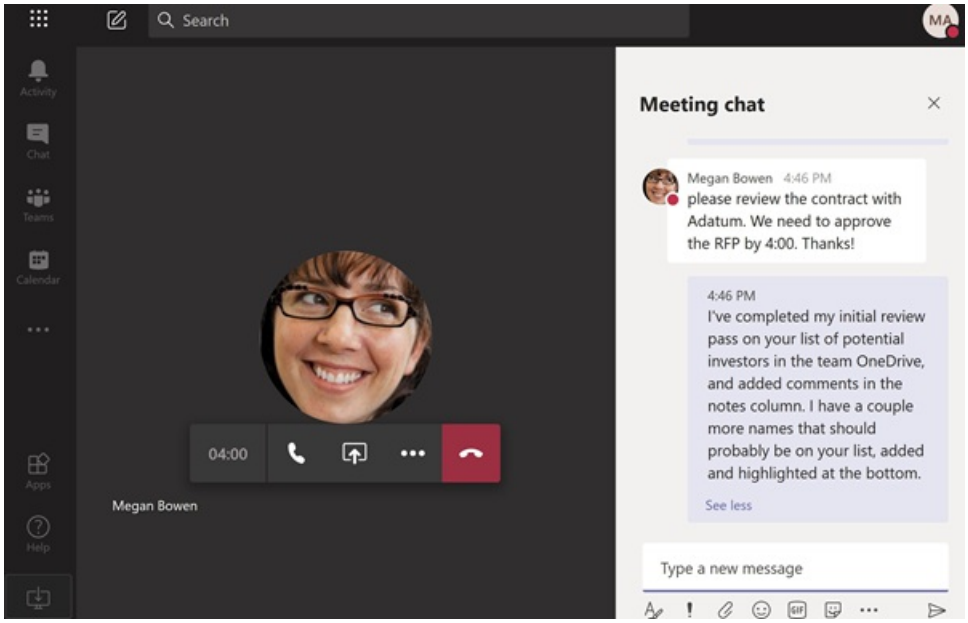
[1] Meeting metadata includes the following:

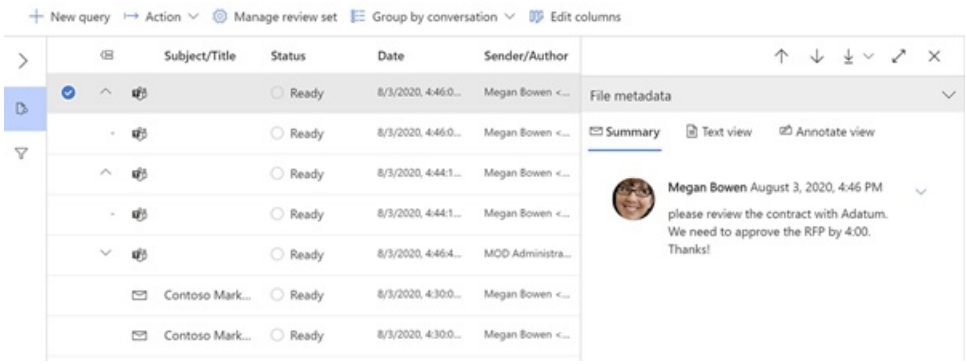
- Meeting or call start and end time, and duration
- Call/Meeting join and leave events for each participant
- VOIP join/calls
- Anonymous join
- Federated user join
- Guest user join

The image shows an example of the metadata.



Here's an example of IM conversation between participants during the meeting.

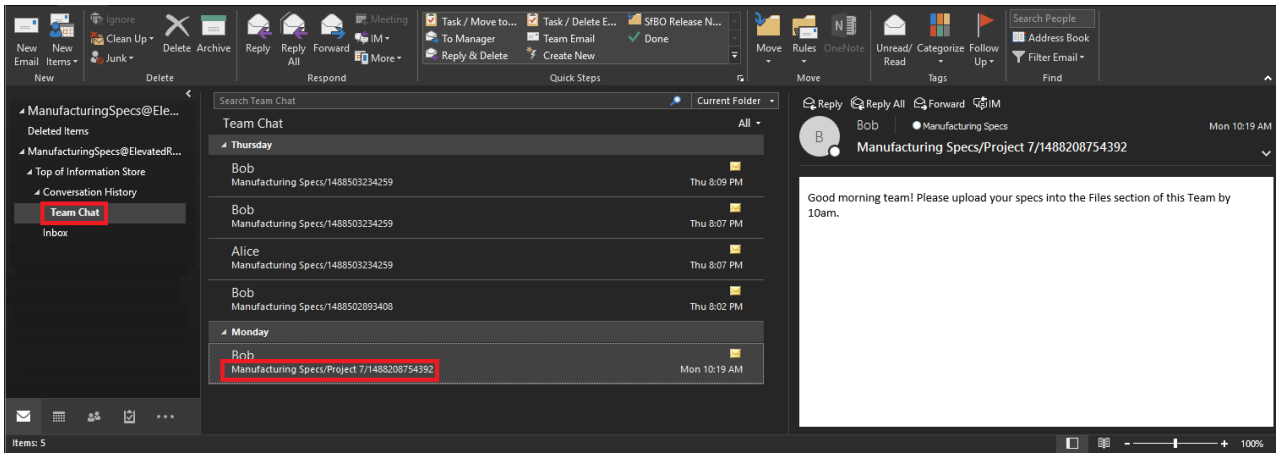




To conduct an eDiscovery investigation with Microsoft Teams content, review step 1 in Get started with Core eDiscovery.

Microsoft Teams data will appear as IM or Conversations in the Excel eDiscovery export output. You can open the `.pst` file in Outlook to view those messages after export.

When viewing the .pst file for the team, all conversations are kept in the Team Chat folder under Conversation History. The title of the message contains the team name and channel name. For example, the image below shows a message from Bob who messaged the Project 7 standard channel of the Manufacturing Specs team.



Private chats in a user's mailbox are stored in the Team Chat folder under Conversation History.

eDiscovery of private channels

Records for messages sent in a private channel are delivered to the mailbox of all private channel members, rather than to a group mailbox. The titles of the records are formatted to indicate which private channel they were sent from.

Because each private channel has its own SharePoint site collection that's separate from the parent team site, files in a private channel are managed independently of the parent team.

Teams doesn't support eDiscovery search of a single channel within a team, so the whole team must be searched. To perform an eDiscovery search of content in a private channel, search across the team, the site collection associated with the private channel (to include files), and mailboxes of private channel members (to include messages).

Use the following steps to identify files and messages in a private channel to include in your eDiscovery search.

Include private channel files in an eDiscovery search

Before you perform these steps, install the SharePoint Online Management Shell and connect to SharePoint Online.

1. Run the following to get a list of all SharePoint site collections associated with private channels in the team.

```
Get-SPOSite
```

2. Run the following PowerShell script to get a list of all SharePoint site collection URLs associated with private channels in the team and the parent team group ID.

```
$sites = get-sposite -template "teamchannel#0"
foreach ($site in $sites) {$x= get-sposite -identity $site.url -detail; $x.relatedgroupID; $x.url}
```

3. For each team or group ID, run the following PowerShell script to identify all relevant private channel sites, where $groupID is the group ID of the team.

```
$sites = get-sposite -template "teamchannel#0"
$groupID = "e8195240-4a70-4830-9106-80193cf717cb"
foreach ($site in $sites) {$x= Get-SpoSite -Identity $site.url -Detail; if ($x.RelatedGroupId -eq
$groupID) {$x.RelatedGroupId;$x.url}}
```

Include private channel messages in an eDiscovery search

Before you perform these steps, make sure you have the latest version of the Teams PowerShell module installed.

1. Run the following to get a list of private channels in the team.

```
Get-TeamChannel -GroupId <GroupID> -MembershipType Private
```

2. Run the following to get a list of private channel members.

```
Get-TeamChannelUser -GroupId <GroupID> -DisplayName "Engineering" -Role Member
```

3. Include the mailboxes of all members from each private channel in the team as part of your eDiscovery search query.

Advanced eDiscovery

Some Microsoft Teams content can also be searched and preserved using the Advanced eDiscovery workflow. While eDiscovery provides a range of search, hold, and export functionality, advanced eDiscovery gives compliance administrators more tools to identify data sources and analyze their contents.

Advanced eDiscovery custodian workflow for Teams content

Custodians might be a member of various teams. You can capture Teams content that is relevant to these custodians. For background and instructions on the custodian workflow, see Advanced eDiscovery workflow.

After adding a custodian, click the **Next** button, then the **Add** button. A window then displays that prompts you to select additional locations, which will show you all of the custodian's memberships and the corresponding SharePoint site locations for their data. From all of these data sources and teams, you can choose the content you want to use for eDiscovery, then place that user and all the data sources that you've identified on hold.

You can select whether to include their Exchange content, their OneDrive content, or both. Exchange content includes all of the application content in the user's mailboxes, such as their email, the Teams content that is stored in their mailbox, and so on. The OneDrive content includes not only the user's content, but also all of the Teams content that is stored in OneDrive, such as 1:1 chats, 1:N chats, and files shared in chats.

You also have the option to associate any team the custodian is a member of so that channel chat messages and files the custodian has access to are included. Additionally, any other team can be associated with a custodian. For

more information, see Add custodians to an Advanced eDiscovery case.

> **NOTE**
> eDiscovery of messages and files in private channels works differently than in standard channels. To learn more, see eDiscovery of private channels.

Placing a data source on hold

If there is no specific user to designate as a custodian, you can place an entire data source on hold. For more information on holds, see Manage holds in Advanced eDiscovery.

When creating a hold for Teams content, you can choose all of the locations you wish to include in your hold. Even if users are deleting or changing content, the hold will maintain copies of all previous versions of that content.

You can also use an optional query to set conditions for the hold based on keywords, date range, author, and many other criteria. If you specify no keywords, then everything from that data source will be subject to the hold.

Advanced eDiscovery searches

Teams content can also be searched. For more information on searches, see Collect data for a case in Advanced eDiscovery. A search will return an entire conversation if even one message matches the search query.

When creating a search query, you can choose custodians so that all the sources that you've already selected will be searched. You can also search non-custodial sources such as a Teams site that is not mapped to a user. Optional queries are also available to narrow your search within the Teams content.

After you've created a search and selected it, a window displays with additional details and actions that you can take on the selected search. If you click the **Statistics** button, you can view statistics about your search, including breakdowns according to location types, the original source for the content, and whether the content is located in a group mailbox, the individual user mailbox, or a SharePoint site. Thus, you can see a breakdown of what sources are contributing to your search results. There is also a **Queries** view available so you can see which individual keywords are contributing to your results.

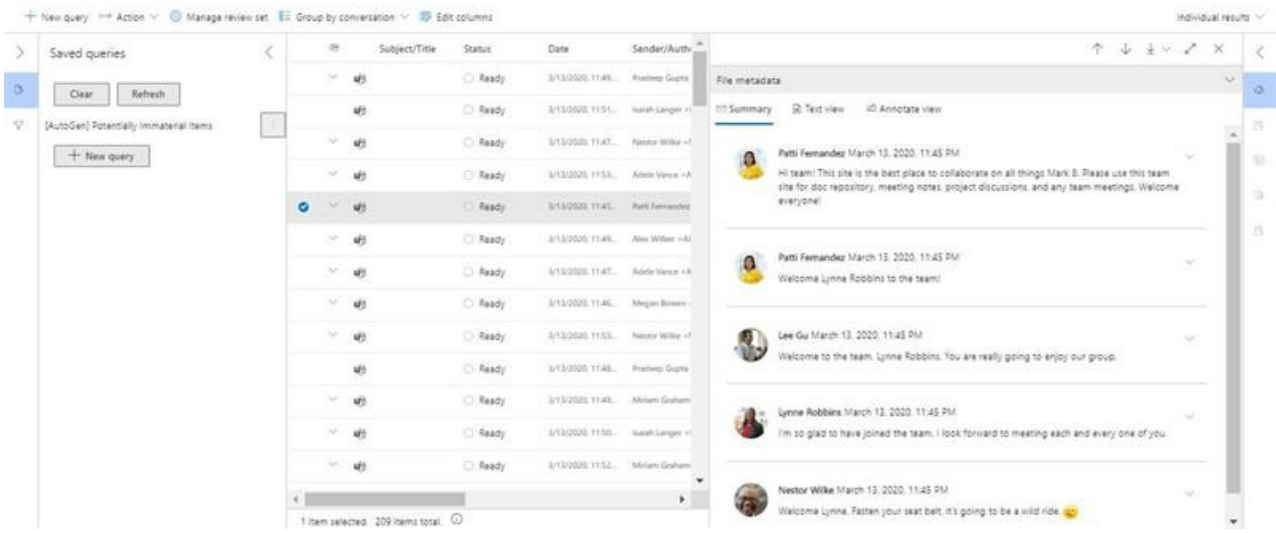
After you finalize your search, you can click the **Add results to review set** button and add it to a review set. For more information about review sets, see Manage review sets in Advanced eDiscovery and Review Sets workflow later in this article.

Normal review sets and conversation review sets

When adding a search to a review set, you can choose from a normal review set or a conversation review set.

A normal review set is similar to an export; it provides the individual `.msg` files for the Teams content and presents the content in a basic view. You would typically use a normal review set when you plan to use other software tools to reprocess the files later.

A conversation review set provides a more intuitive, threaded view of the conversations; it displays related messages together in the proper order.



Functionality such as redaction is available in both types of review sets. For more information about review sets, see Review conversations in advanced eDiscovery.

Collection options

When adding to a review set, there are several options available as checkboxes under the **Collection Options** section of the window, including **Conversation Retrieval Options** and **Teams Conversations**. If you enable these options, any individual Teams messages that are part of your review set will also be shown with additional messages surrounding them for context. For example, if your query is specific and only one message is returned as a result, enabling these options will also return several messages leading up to and following the message that matched your query.

Many logical criteria are used to determine whether additional messages provide context to messages that match your query. For example, for Teams content, enabling these options will retrieve the parent message and all the child messages because of the way the messages are threaded.

Message time stamps are also checked. If a message matches your query, neighboring messages that precede it within a span of 4 hours or that follow it within a span of 4 hours are considered to be part of the conversation and are also included in the results.

If you must be certain about which contextual messages will be returned with matches to your search query, you do not need to use these options. You can either collect all content, or you can widen the date range of your search so that more messages are returned as a result of your query.

Review sets workflow

You can view existing review sets or create new ones by clicking the **Review Sets** tab. For more information about review sets, see Manage review sets in Advanced eDiscovery.

In addition to documents, you can add emails, Teams messages, Yammer messages, and other content to your review set. Within a review set, you can also perform many of the same operations that you can perform in other contexts, such as searching content and creating custom queries. These operations only apply to items that have been added to the review set.

The **Manage Review Sets** button provides additional options such as analytics, summary reporting, how many load sets have been added, and so on.

To access visualizations and charts of your data, click **Individual results** > **Search profile view** in the upper right. You can click on wedges in these charts to interactively select the type of content you want to query. For example, you can choose to query only Teams content. You can also save these queries just as you would save queries that you write manually.

Summary view, text view, and annotate view

If you click on a Teams conversation in the review set, it displays the **Summary view**, which displays an entire

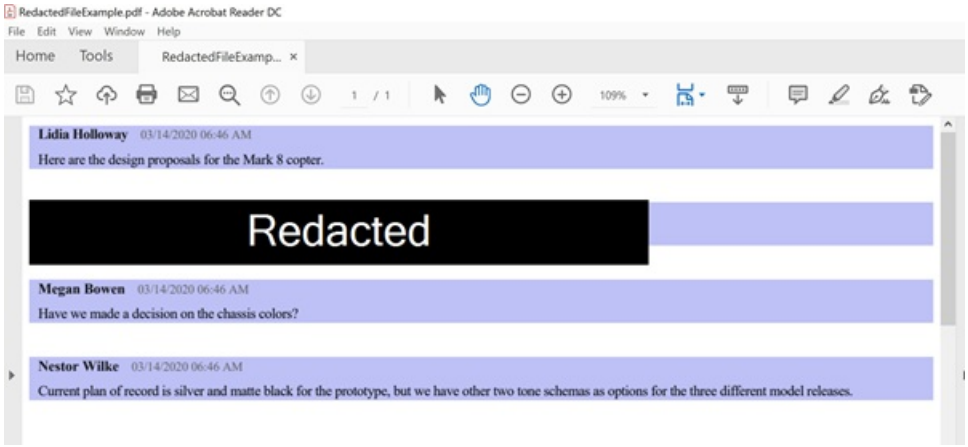
Teams conversation as a list of messages that you can interact with individually. Click the downward arrow to the right of a message to display a context menu that allows you to view message details or download the individual `.msg` file. Clicking message details will show you a summary of metadata or the full metadata of the message.

To download a PDF, click the download button at the upper right of the summary view.

Click the **Text view** tab to display a plain text view of the extracted text of the Teams conversation. This plain text content is suitable for export and you can easily work with it using other software tools.

Click on the **Annotate view** tab to access annotation features. This tab displays the content in a format that resembles a Teams conversation, but there are also additional options for editing. There is a pencil tool that you can use to make notes, draw on the message, or do fine-grained scratching out for redaction purposes. There is also an **Area redaction** tool that you can use to draw a rectangle that blacks out the area and marks it as "Redacted".

Here's an example of a redacted file for threaded conversation between users.



At the bottom of the **Annotate view** tab is the **Tag documents** button, which displays the tagging panel. Within this panel, you can apply a tag to all messages within the Teams conversation. You can label a conversation as responsive or non-responsive, privileged or not privileged, whether it contains "Interesting items", whether it should be included in export, and whether it needs further review. You can also manage and apply other customizable tags.

Action menu

Within the review sets window, you can export the content by clicking **Action** > **Export**. There are many options available when exporting.

To export a file that contains all the metadata for all Teams messages, click to select the **Load file** checkbox. To include in your file any tags that you have applied to the content, click to select the **Tags** checkbox.

Use the **Native files** option to export files in their native format. You can choose to export a conversation as one file or all individual chat messages in their own separate files.

The **Text files** option allows you to save plain text versions of content. For more information about how to obtain a plain text view of Teams conversations in the review set, see Summary view, text view, and annotate view above.

If you applied any redactions to the content as described in the Summary view, text view, and annotate view section above, you can select the **Replace redacted natives with converted PDFs** option to replace the native files with converted copies in PDF.

You can choose to export to a Microsoft-provided Azure blob storage container or you can provide your own Azure Blob storage container.

When you are ready to begin the export process, click the **Export** button. See Download export jobs for more information about how you can access the Azure blob storage container and download your exported content after export is complete.

NOTE

Exporting can take an extended period of time. To track the status of the export process, exit the **Review sets** tab and click the **Exports** tab.

Related topics

- eDiscovery in Microsoft 365
- Teams PowerShell Overview

Place a Microsoft Teams user or team on legal hold

12/5/2020 • 3 minutes to read • Edit Online

When a reasonable expectation of litigation exists, organizations are required to preserve electronically stored information (ESI), including Teams chat messages that are relevant to the case. Organizations may need to preserve all messages related to a specific topic or for certain individuals. This article will cover legal hold in Microsoft Teams (To address hold implementation across the M365 space, please review Manage eDiscovery cases: Place content locations on hold.).

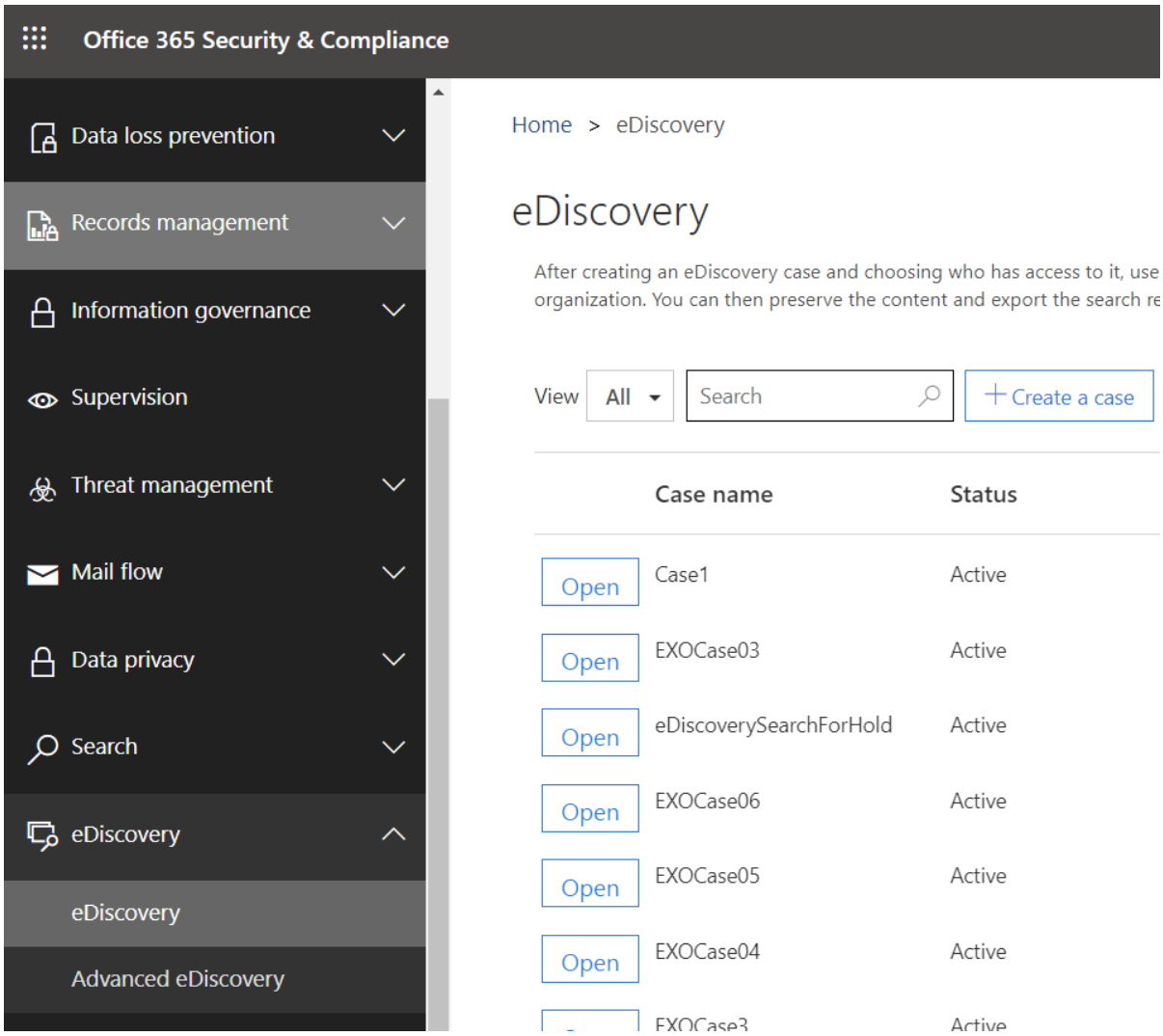
> **NOTE**
> In Feb 2020, we turned on legal hold or case hold on private channels (private channel chats are stored in user mailboxes, normal channel chats are stored in that Teams' group mailboxes). If there is already a legal hold in place for a user mailbox, the hold policy will now automatically apply to private channel messages stored in that mailbox. There is no further action needed for an admin to turn this on. Legal hold of files shared in private channels is also supported.

Within Microsoft Teams, an entire team or select users can be put on hold or legal hold. Doing that will make sure that all messages that were exchanged in those teams (including private channels) or messages exchanged by those individuals are discoverable by the organization's compliance managers or Teams Admins.

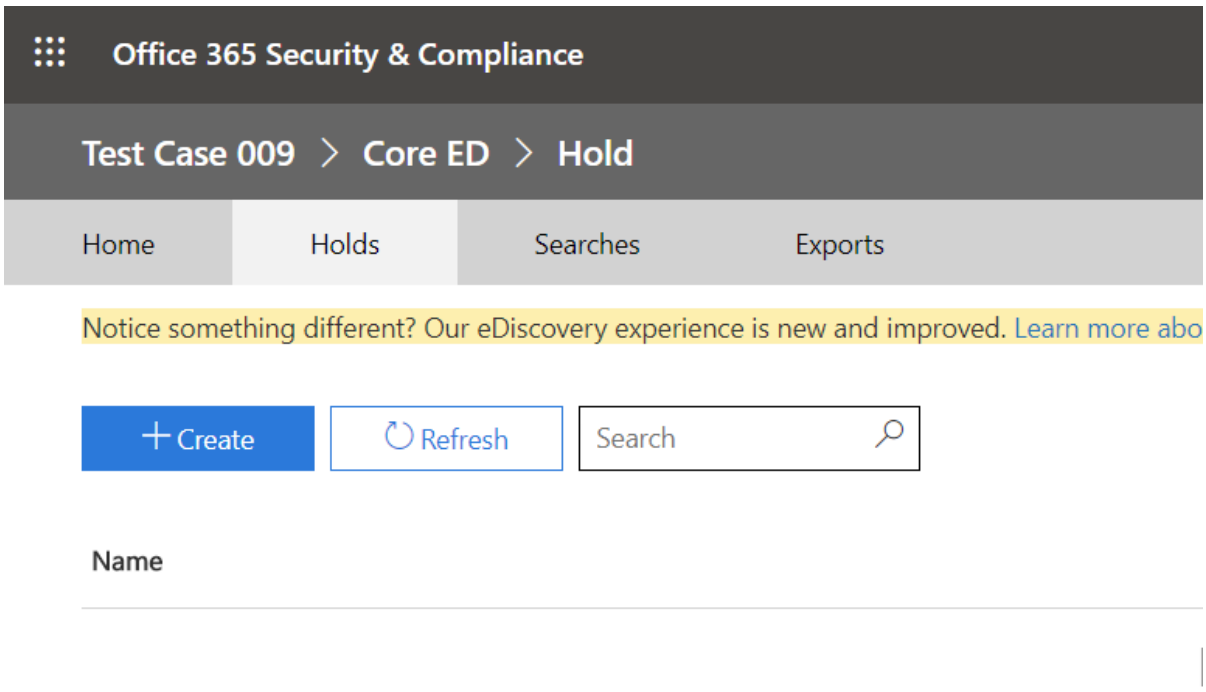
> **NOTE**
> Placing a user on hold does not automatically place a group on hold or vice-versa.

To put a user or a team on Legal Hold:

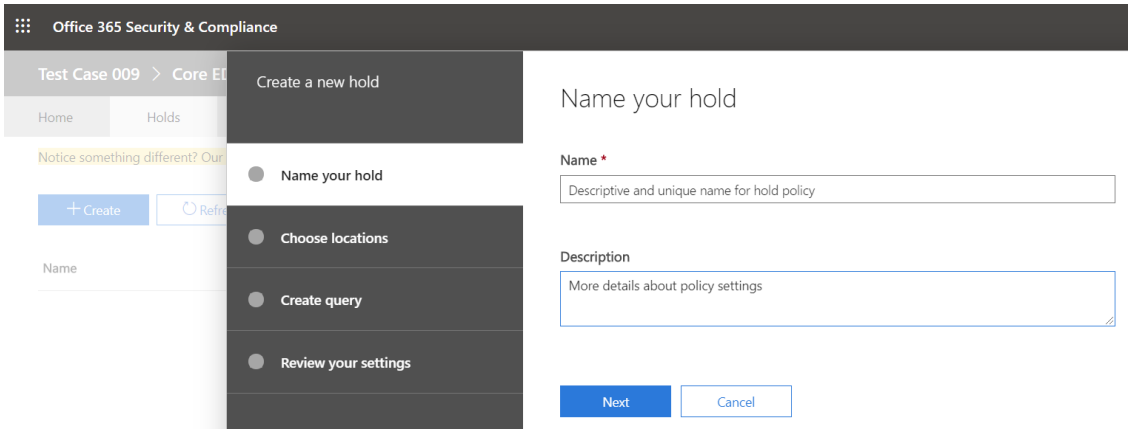
1. Navigate to the Security & Compliance Center. When you create a new case, you are presented with the option to place mailboxes or sites on hold.
2. Go to eDiscovery or Advanced eDiscovery and create a case by clicking "Create a case". Once the case is created, open it.



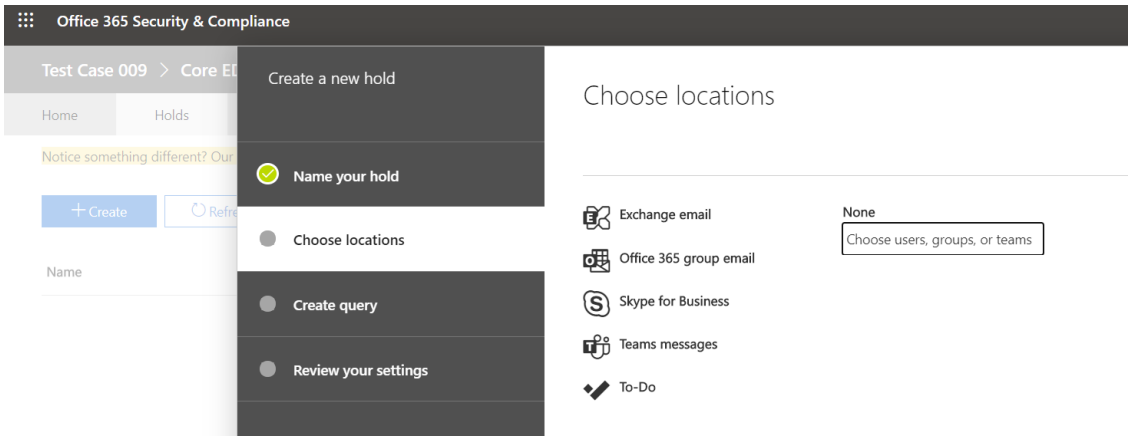
3. Go to the "Holds" section from the top menu and click "+ Create" to create a hold. Putting a user or a team on hold saves all the messages exchanged by those users or messages. When you create a new case, you are presented with the option to place mailboxes or sites on hold.



a. **Name your hold**. Select a descriptive and unique name for the hold you are going to create.



b. **Choose location**. Choose whether you want the hold to be applied on a user or on an entire Team (hold cannot be applied on individual channels for now). Note: if a user is on hold, all their messages would be on hold, including whatever they sent in a 1:1 chat, 1:many or group chat, or a channel conversation (including private channels).



c. **Create Query**. You can customize the hold if you want more granularity in the hold policy. For example, you can specify keywords to look for, or you can add more conditions, that would need to be satisfied for the hold to take effect.

d. **Review your settings** before publishing it to your organization.

After the legal hold has been set, you can discover all the content retained by any hold policy following the Teams eDiscovery article.

> **IMPORTANT**
>
> When a user or group is placed on hold, all message copies will be retained. For example, if a user posted a message in a channel and then modified the message, in a hold scenario, both copies of the message are retained. Without the legal hold in-place, only the latest message is retained.

As a helpful guide, you can use the table below to understand what needs to be placed on Legal Hold based on data requirements:

SCENARIO	WHAT TO PLACE ON HOLD	
Microsoft Teams chat content by a user (on 1:1 chats, 1:many or group chats, private channel conversations, etc.)	User mailbox	

SCENARIO	WHAT TO PLACE ON HOLD	
Microsoft Teams Channel chats (excluding private channels)	Group mailbox used for the team	
Microsoft Teams content (for example, Wiki, Files)	SharePoint site used by the team	
Microsoft Teams Private Channel files	Dedicated SharePoint site for private	
User's private content	OneDrive for Business site of the user	

> **NOTE**
> To retain communication in private channels, you need to put the user mailboxes (Private channel users) on hold and when using eDiscovery tool to search, you should search in that user's mailbox. As was stated earlier, private channel chats are stored in user mailboxes, not in group mailbox of a Team.

If you want to read further on this topic for non-Teams areas in M365, you should review Manage eDiscovery cases: Place content locations on hold.

Use Content Search in Microsoft Teams

7/13/2020 • 2 minutes to read • Edit Online

> **NOTE**
> Content search of messages and files in private channels work differently than in standard channels. To learn more, see Content search of private channels.

Content Search provides a way to query Microsoft Teams information spanning Exchange, SharePoint Online, and OneDrive for Business.

To learn more, read Content Search in Microsoft 365 or Office 365.

For example, using **Content Search** against your Manufacturing Specs mailbox and Manufacturing Specs SharePoint site, you can search against Teams standard channel conversations from Exchange, file uploads and modifications from SharePoint Online, and OneNote changes.

You can also add query criteria to the **Content Search** to narrow the results returned. In the above example, you can look for content where the keywords "**New Factory Specs**" were used.

> **TIP**
> After adding search conditions, you can export a report or the data to your computer for analysis.

Content search of private channels

Records for messages sent in a private channel are delivered to the mailbox of all private channel members, rather than to a group mailbox. The titles of the records are formatted to indicate which private channel they were sent from.

Because each private channel has its own SharePoint site collection that's separate from the parent team site, files in a private channel are managed independently of the parent team.

Teams doesn't support content search of a single channel, so the whole team must be searched. To perform a content search of a private channel, search across the team, the site collection associated with the private channel (to include files), and mailboxes of private channel members (to include messages).

Use the following steps to identify files and messages in a private channel to include in your content search.

Include private channel files in a content search

Before you perform these steps, install the SharePoint Online Management Shell and connect to SharePoint Online.

1. Run the following to get a list of all SharePoint site collections associated with private channels in the team.

```
Get-SPOSite
```

2. Run the following PowerShell script to get a list of all SharePoint site collection URLs associated with private channels in the team and the parent team group ID.

```
$sites = get-sposite -template "teamchannel#0"
foreach ($site in $sites) {$x= get-sposite -identity $site.url -detail; $x.relatedgroupID; $x.url}
```

3. For each team or group ID, run the following PowerShell script to identify all relevant private channel sites.

```
$sites = get-sposite -template "teamchannel#0"
$groupID = "e8195240-4a70-4830-9106-80193cf717cb"
foreach ($site in $sites) {$x= Get-SpoSite -Identity $site.url -Detail; if ($x.RelatedGroupId -eq
$groupID) {$x.RelatedGroupId;$x.url}}
```

Include private channel messages in a content search

Before you perform these steps, make sure you have the latest version of the Teams PowerShell module installed.

1. Run the following to get a list of private channels in the team.

```
Get-TeamChannel -GroupId <GroupID> -MembershipType Private
```

2. Run the following to get a list of private channel members.

```
Get-TeamChannelUser -GroupId <GroupID> -DisplayName "Engineering" -Role Member
```

3. Include the mailboxes of all members from each private channel in the team as part of your content search query.

Related topics

- eDiscovery cases in the Microsoft 365 Compliance Center

Search the audit log for events in Microsoft Teams

11/2/2020 • 13 minutes to read • Edit Online

IMPORTANT

The Microsoft Teams admin center is gradually replacing the Skype for Business admin center, and we're migrating Teams settings to it from the Microsoft 365 admin center. If a setting has been migrated, you'll see a notification and then be directed to the setting's location in the Teams admin center. For more information, see Manage Teams during the transition to the Teams admin center.

The audit log can help you investigate specific activities across Microsoft 365 services. For Microsoft Teams, here are some of the activities that are audited:

- Team creation
- Team deletion
- Added channel
- Changed setting

For a complete list of Teams activities that are audited, see Teams activities and Shifts in Teams activities (in preview).

NOTE

Audit events from private channels are also logged as they are for teams and standard channels.

Turn on auditing in Teams

Before you can look at audit data, you have to first turn on auditing in the Security & Compliance Center. For help with turning on auditing, read Turn audit log search on or off.

IMPORTANT

Audit data is only available from the point at which you turned on auditing.

Retrieve Teams data from the audit log

1. To retrieve audit logs, go to the Security & Compliance Center. Under **Search**, select **Audit log search**.
2. Use **Search** to filter by the activities, dates, and users you want to audit.
3. Export your results to Excel for further analysis.

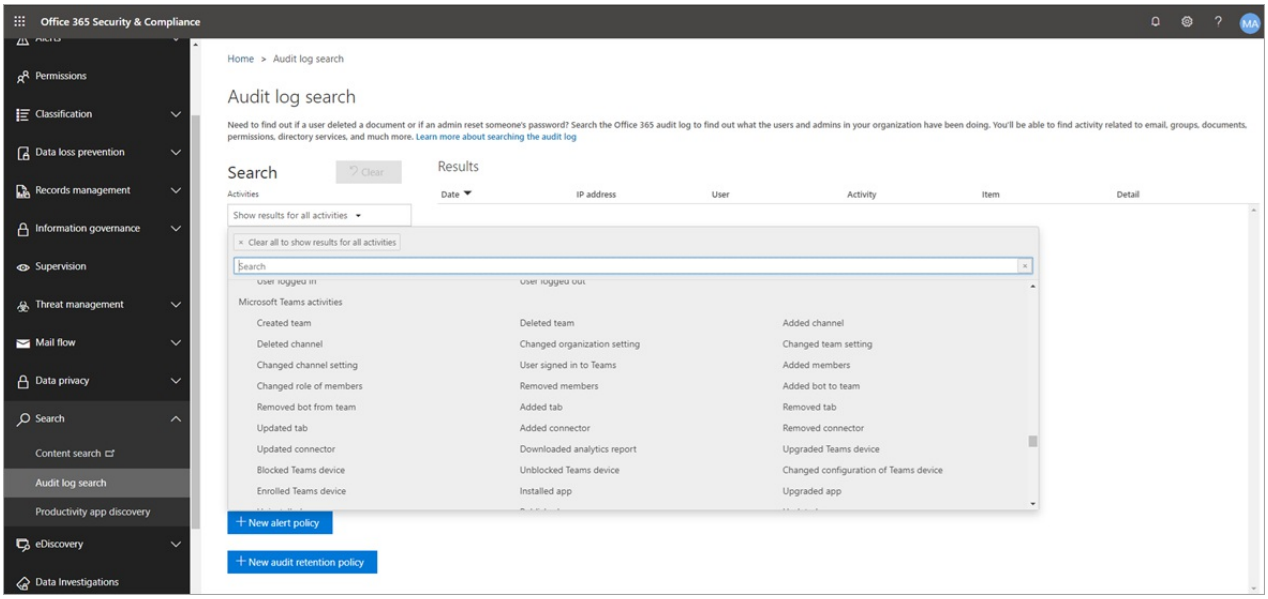
IMPORTANT

Audit data is only visible in the audit log if auditing is turned on.

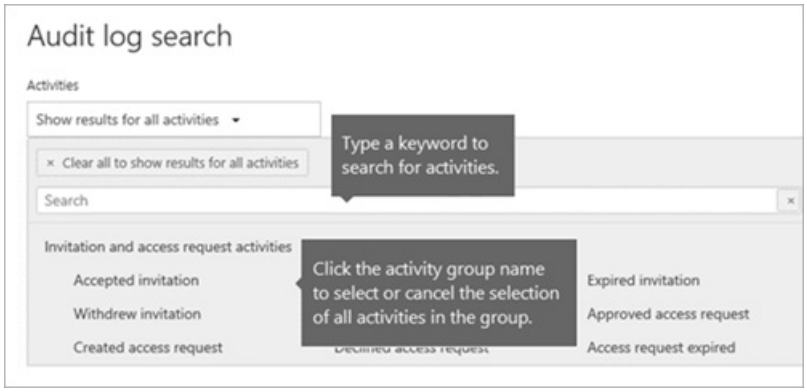
The length of time that an audit record is retained and searchable in the audit log depends on your Microsoft 365 or Office 365 subscription, and specifically the type of license that's assigned to users. To learn more, see the Security & Compliance Center service description.

Tips for searching the audit log

Here are tips for searching for Teams activities in the audit log.



- You can select specific activities to search for by clicking the activity name. Or you can search for all activities in a group (such as **File and folder activities**) by clicking the group name. If an activity is selected, you can click it to cancel the selection. You can also use the search box to display the activities that contain the keyword that you type.



- To display events for activities run using cmdlets, select **Show results for all activities** in the **Activities** list. If you know the name of the operation for these activities, search for all activities, and then filter the results by typing the name of the operation in the box in the **Activity** column. To learn more, see Step 3: Filter the search results.

- To clear the current search criteria, click **Clear**. The date range returns to the default of the last seven days. You can also click **Clear all to show results for all activities** to cancel all selected activities.

- If 5,000 results are found, you can probably assume that there are more than 5,000 events that met the search criteria. You can refine the search criteria and rerun the search to return fewer results, or you can export all the search results by selecting **Export results** > **Download all results**.

Check out this video for using audio log search. Join Ansuman Acharya, a program manager for Teams, as he demonstrates how to do an audit log search for Teams.

Use Cloud App Security to set activity policies

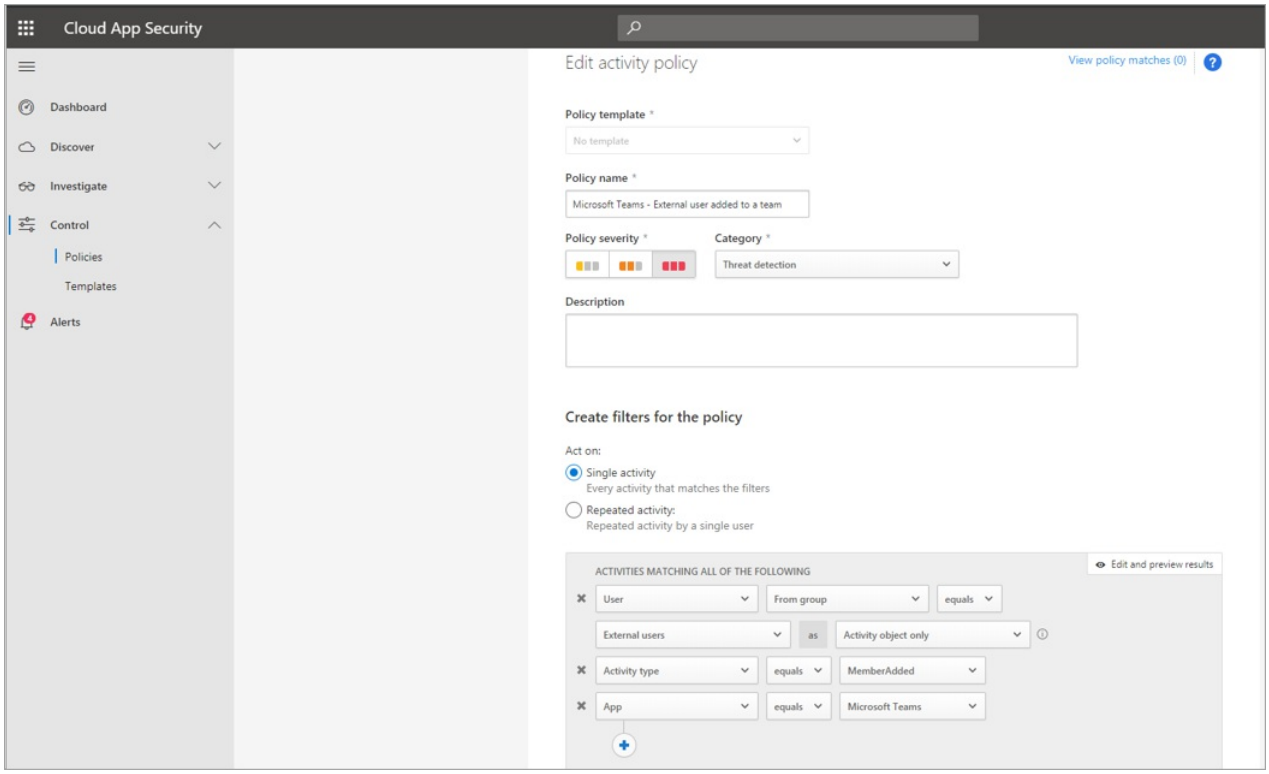
Using Microsoft Cloud App Security integration, you can set activity policies to enforce a wide range of automated

processes using the app provider's APIs. These policies enable you to monitor specific activities carried out by various users, or follow unexpectedly high rates of one certain type of activity.

After you set an activity detection policy, it starts to generate alerts. Alerts are only generated on activities that occur after you create the policy. Here's some example scenarios for how you can use activity policies in Cloud App Security to monitor Teams activities.

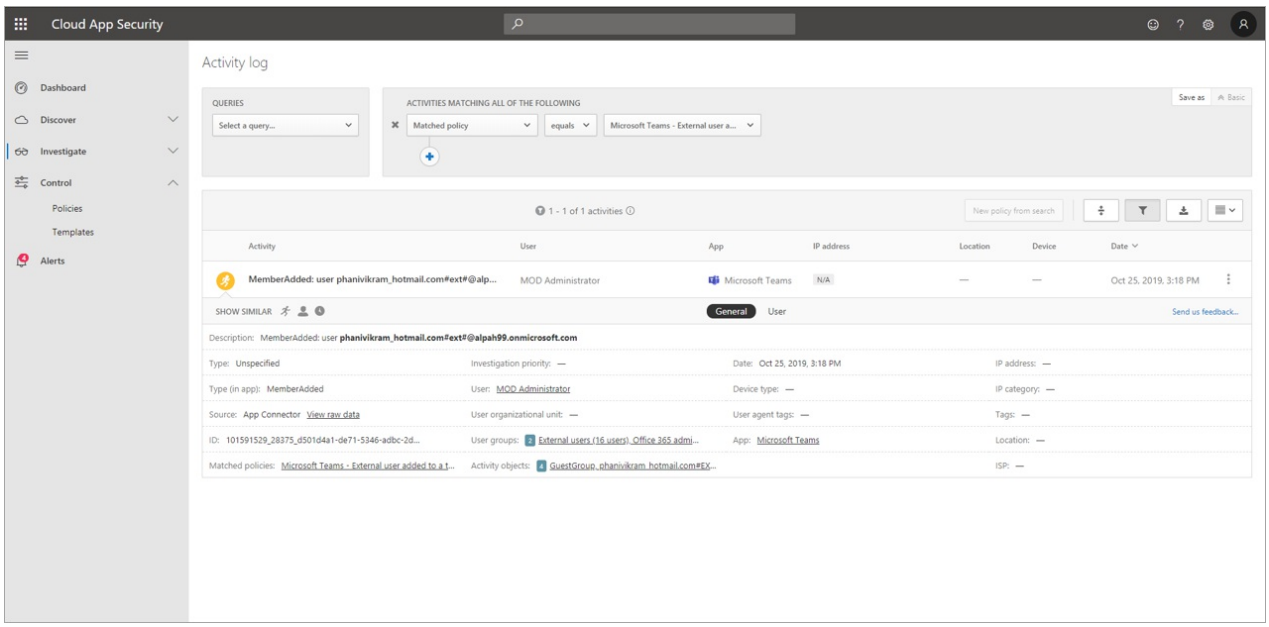
External user scenario

One scenario you might want to keep an eye on, from a business perspective, is the addition of external users to your Teams environment. If external users are enabled, monitoring their presence is a good idea. You can use Cloud App Security to identify potential threats.



The screenshot of this policy to monitor adding external users allows you to name the policy, set the severity according to your business needs, set it as (in this case) a single activity, and then establish the parameters that will specifically monitor only the addition of non-internal users, and limit this activity to Teams.

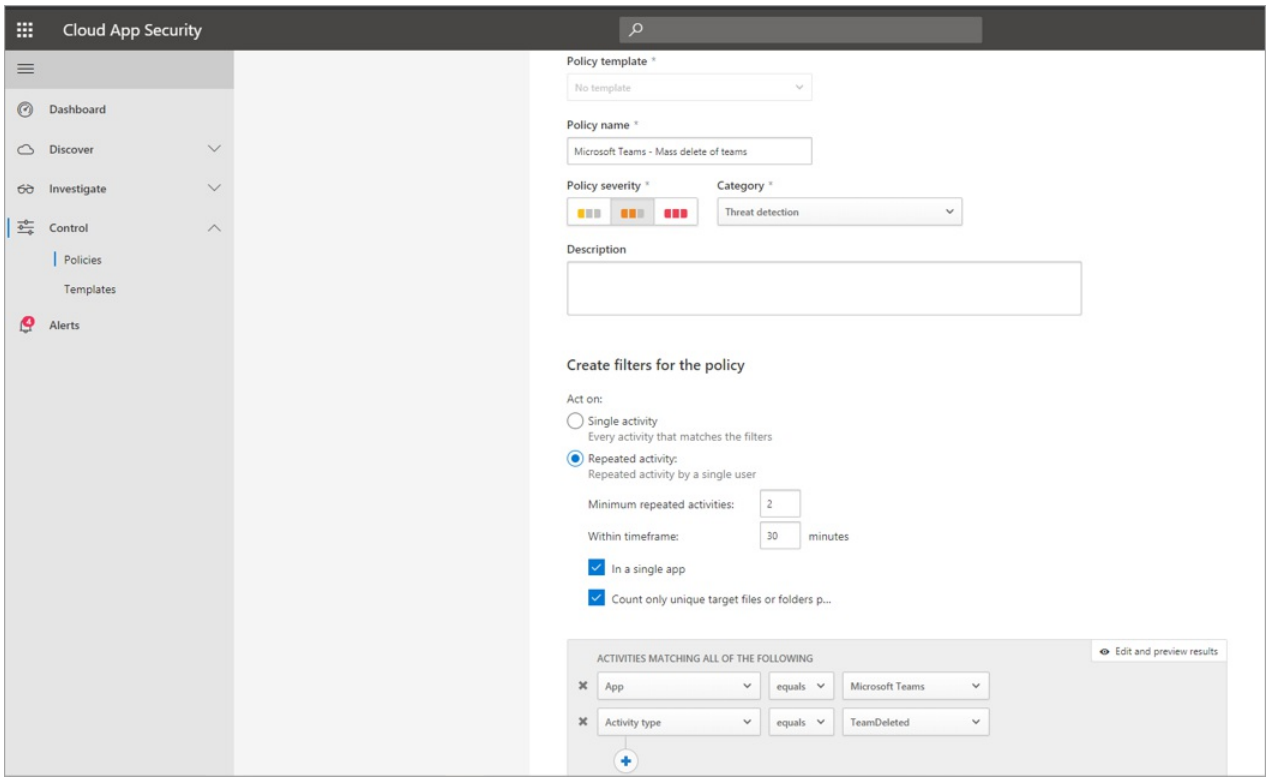
The results from this policy can be viewed in the activity log:



Here you can review matches to the policy you've set, and make any adjustments as needed, or export the results to use elsewhere.

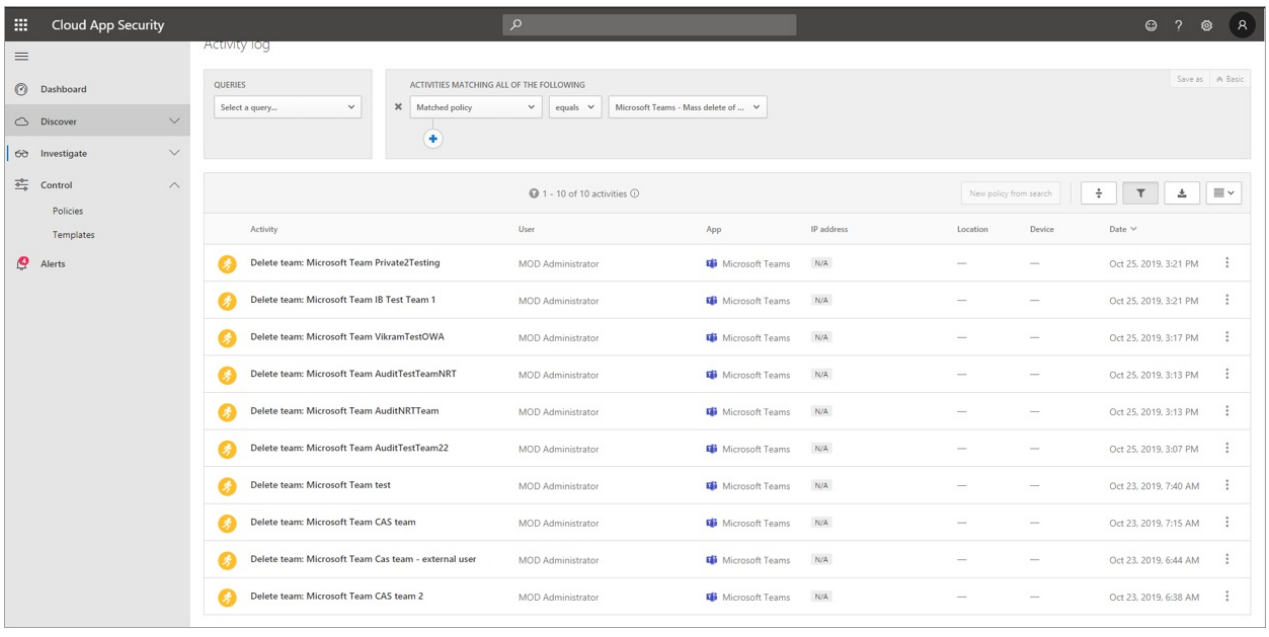
Mass delete scenario

As mentioned earlier, you can monitor deletion scenarios. It's possible to create a policy that would monitor mass deletion of Teams sites. In this example, an alert-based policy is set up to detect mass deletion of teams in a span of 30 minutes.



As the screenshot shows, you can set many different parameters for this policy to monitor Teams deletions, including severity, single or repeated action, and parameters limiting this to Teams and site deletion. This can be done independently of a template, or you may have a template created to base this policy on, depending on your organizational needs.

After you establish a policy that works for your business, you can review the results in the activity log as events are triggered:

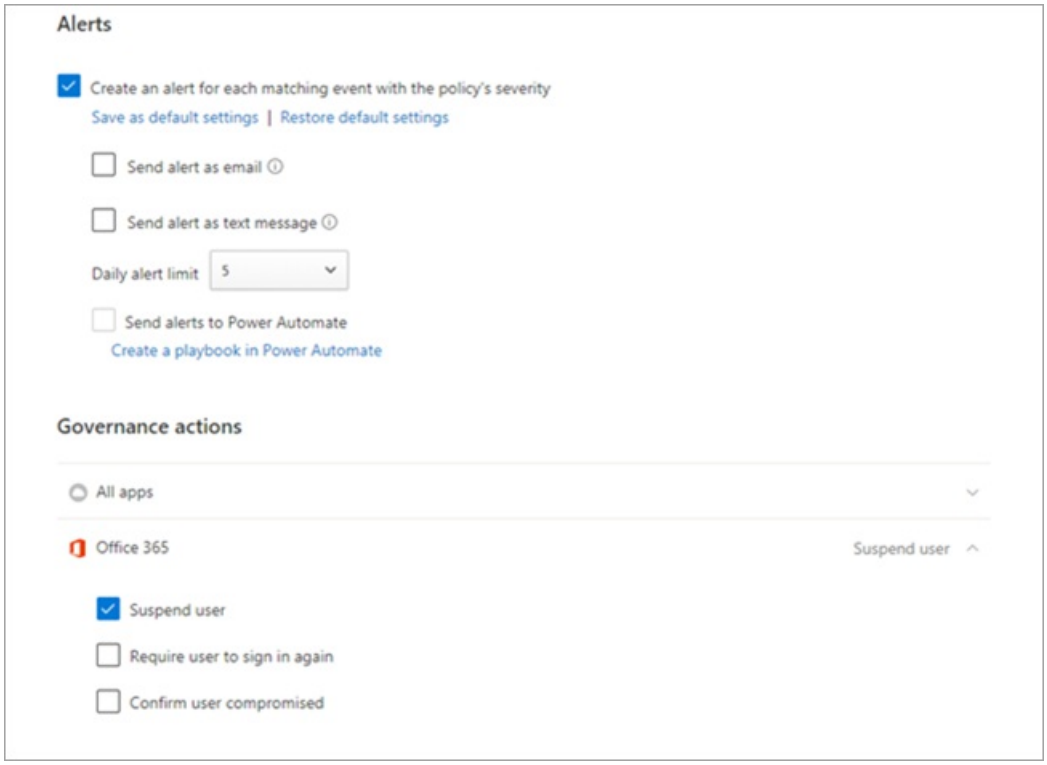


You can filter down to the policy you've set to see the results of that policy. If the results you're getting in the

activity log are not satisfactory (maybe you're seeing lots of results, or nothing at all), this may help you to fine-tune the query to make it more relevant to what you need it to do.

Alert and governance scenario

You can set alerts and send emails to admins and other users when an activity policy is triggered. You can set automated governance actions such as suspending a user or making a user to sign in again in an automated way. This example shows how a user account can be suspended when an activity policy is triggered and determines a user deleted two or more teams in 30 minutes.



Use Cloud App Security to set anomaly detection policies

Anomaly detection policies in Cloud App Security provide out-of-the-box user and entity behavioral analytics (UEBA) and machine learning (ML) so that you can immediately run advanced threat detection across your cloud environment. Because they're automatically enabled, the new anomaly detection policies provide immediate results by providing immediate detections, targeting numerous behavioral anomalies across your users and the machines and devices connected to your network. Additionally, the new policies expose more data from the Cloud App Security detection engine, to help you speed up the investigation process and contain ongoing threats.

We're working to integrate Teams events into anomaly detection policies. For now, you can set up anomaly detection policies for other Office products and take action items on users who match those policies.

Teams activities

Here's a list of all events that are logged for user and admin activities in Teams in the Microsoft 365 audit log. The table includes the friendly name that's displayed in the **Activities** column and the name of the corresponding operation that appears in the detailed information of an audit record and in the CSV file when you export the search results.

FRIENDLY NAME	OPERATION	DESCRIPTION
Added bot to team	BotAddedToTeam	A user adds a bot to a team.
Added channel	ChannelAdded	A user adds a channel to a team.

FRIENDLY NAME	OPERATION	DESCRIPTION
Added connector	ConnectorAdded	A user adds a connector to a channel.
Added members	MemberAdded	A team owner adds members to a team, channel, or group chat.
Added tab	TabAdded	A user adds a tab to a channel.
Changed channel setting	ChannelSettingChanged	The ChannelSettingChanged operation is logged when the following activities are performed by a team member. For each of these activities, a description of the setting that was changed (shown in parentheses is displayed in the **Item** column in the audit log search results. • Changes name of a team channel (**Channel name**) • Changes description of a team channel (**Channel description**)
Changed organization setting	TeamsTenantSettingChanged	The TeamsTenantSettingChanged operation is logged when the following activities are performed by a global admin in the Microsoft 365 admin center. These activities affect org-wide Teams settings. To learn more, see Manage Teams settings for your organization. For each of these activities, a description of the setting that was changed (shown in parentheses) is displayed in the **Item** column in the audit log search results. • Enables or disables Teams for the organization (**Microsoft Teams**). • Enables or disables interoperability between Microsoft Teams and Skype for Business for the organization (**Skype for Business interoperability**). • Enables or disables the organizational chart view in Microsoft Teams clients (**Org chart view**). • Enables or disables the ability for team members to schedule private meetings (**Private meeting scheduling**). • Enables or disables the ability for team members to schedule channel meetings (**Channel meeting scheduling**). • Enables or disables video calling in Teams meetings (**Video for Skype meetings**). • Enables or disables screen sharing in Microsoft Teams

FRIENDLY NAME	OPERATION	DESCRIPTION
		meetups for the organization (**Screen sharing for Skype meetings**). • Enables or disables that ability to add animated images (called Giphys) to Teams conversations (**Animated images**). • Changes the content rating setting for the organization (**Content rating**). The content rating restricts the type of animated image that can be displayed in conversations. • Enables or disables the ability for team members to add customizable images (called custom memes) from the internet to team conversations (**Customizable images from the Internet**). • Enables or disables the ability for team members to add editable images (called stickers) to team conversations (**Editable images**). • Enables or disables that ability for team members to use bots in Microsoft Teams chats and channels (**Org-wide bots)**. • Enables specific bots for Microsoft Teams. This doesn't include the T-Bot, which is Teams help bot that's available when bots are enabled for the organization (**Individual bots**). • Enables or disables the ability for team members to add extensions or tabs (**Extensions or tabs**). • Enables or disables the side-loading of proprietary bots for Microsoft Teams (**Side loading of Bots**). • Enables or disables the ability for users to send email messages to a Microsoft Teams channel (**Channel email**).
Changed role of members in team	MemberRoleChanged	A team owner changes the role of members in a team. The following values indicate the role type assigned to the user. 1 - Indicates the Member role. 2 - Indicates the Owner role. 3 - Indicates the Guest role. The Members property also includes the name of your organization and the member's email address.

FRIENDLY NAME	OPERATION	DESCRIPTION
Changed team setting	TeamSettingChanged	The TeamSettingChanged operation is logged when the following activities are performed by a team owner. For each of these activities, a description of the setting that was changed (shown in parentheses) is displayed in the **Item** column in the audit log search results. • Changes the access type for a team. Teams can be set as private or public (**Team access type**). When a team is private (the default setting), users can access the team only by invitation. When a team is public, it's discoverable by anyone. • Changes the information classification of a team (**Team classification**). For example, team data can be classified as high business impact, medium business impact, or low business impact. • Changes the name of a team (**Team name**). • Changes the team description (**Team description**). • Changes made to team settings. To access these settings, a team owner can right-click a team, select **Manage team**, and then click the **Settings** tab. For these activities, the name of the setting that was changed is displayed in the **Item** column in the audit log search results.
Created team	TeamCreated	A user creates a team.
Deleted all organization apps	DeletedAllOrganizationApps	Deleted all organization apps from the catalog.
Deleted app	AppDeletedFromCatalog	An app has been deleted from the catalog.
Deleted channel	ChannelDeleted	A user deletes a channel from a team.
Deleted team	TeamDeleted	A team owner deletes a team.
Installed app	AppInstalled	An app was installed.

FRIENDLY NAME	OPERATION	DESCRIPTION
Performed action on card	PerformedCardAction	A user took action on an adaptive card within a chat. Adaptive cards are typically used by bots to allow the rich display of information and interaction in chats. **Note:** Only inline input actions on an adaptive card inside a chat will be available in the audit log. For example, when a user submits a poll response in a channel conversation on an adaptive card generated by a Poll bot. User actions such as "View result", which will open a dialog, or user actions inside dialogs won't be available in the audit log.
Published app	AppPublishedToCatalog	An app was added to the catalog.
Removed bot from team	BotRemovedFromTeam	A user removes a bot from a team.
Removed connector	ConnectorRemoved	A user removes a connector from a channel.
Removed members	MemberRemoved	A team owner removes members from a team, channel, or group chat.
Removed tab	TabRemoved	A user removes a tab from a channel.
Uninstalled app	AppUninstalled	An app was uninstalled.
Updated app	AppUpdatedInCatalog	An app was updated in the catalog.
Updated connector	ConnectorUpdated	A user modified a connector in a channel.
Updated tab	TabUpdated	A user modified a tab in a channel.
Upgraded app	AppUpgraded	An app was upgraded to its latest version in the catalog.
User signed in to Teams	TeamsSessionStarted	A user signs in to a Microsoft Teams client. This event doesn't capture token refresh activities.

Shifts in Teams activities

(in preview)

If your organization is using the Shifts app in Teams, you can search the audit log for activities related to the Shifts app. Here's a list of all events that are logged for Shifts activities in Teams in the Microsoft 365 audit log.

FRIENDLY NAME	OPERATION	DESCRIPTION
Added scheduling group	ScheduleGroupAdded	A user successfully adds a new scheduling group to the schedule.
Edited scheduling group	ScheduleGroupEdited	A user successfully edits a scheduling group.
Deleted scheduling group	ScheduleGroupDeleted	A user successfully deletes a scheduling group from the schedule.
Withdrew schedule	ScheduleWithdrawn	A user successfully withdraws a published schedule.
Added shift	ShiftAdded	A user successfully adds a shift.
Edited shift	ShiftEdited	A user successfully edits a shift.
Deleted shift	ShiftDeleted	A user successfully deletes a shift.
Added time off	TimeOffAdded	A user successfully adds time off on the schedule.
Edited time off	TimeOffEdited	A user successfully edits time off.
Deleted time off	TimeOffDeleted	A user successfully deletes time off.
Added open shift	OpenShiftAdded	A user successfully adds an open shift to a scheduling group.
Edited open shift	OpenShiftEdited	A user successfully edits an open shift in a scheduling group.
Deleted open shift	OpenShiftDeleted	A user successfully deletes an open shift from a scheduling group.
Shared schedule	ScheduleShared	A user successfully shared a team schedule for a date range.
Clocked in using Time clock	ClockedIn	A user successfully clocks in using Time clock.
Clocked out using Time clock	ClockedOut	A user successfully clocks out using Time clock.
Started break using Time clock	BreakStarted	A user successfully starts a break during an active Time clock session.
Ended break using Time clock	BreakEnded	A user successfully ends a break during an active Time clock session.
Added Time clock entry	TimeClockEntryAdded	A user successfully adds a new manual Time clock entry on Time Sheet.

FRIENDLY NAME	OPERATION	DESCRIPTION
Edited Time clock entry	TimeClockEntryEdited	A user successfully edits a Time clock entry on Time Sheet.
Deleted Time clock entry	TimeClockEntryDeleted	A user successfully deletes a Time clock entry on Time Sheet.
Added shift request	RequestAdded	A user added a shift request.
Responded to shift request	RequestRespondedTo	A user responded to a shift request.
Canceled shift request	RequestCancelled	A user canceled a shift request.
Changed schedule setting	ScheduleSettingChanged	A user changes a setting in Shifts settings.
Added workforce integration	WorkforceIntegrationAdded	The Shifts app is integrated with a third-party system.
Accepted off shift message	OffShiftDialogAccepted	A user acknowledges the off-shift message to access Teams after shift hours.

Office 365 Management Activity API

You can use the Office 365 Management Activity API to retrieve information about Teams events. To learn more about the Management Activity API schema for Teams, see Teams schema.

Attribution in Teams audit logs

Membership changes to Teams (such as users added or deleted) made through Azure Active Directory (Azure AD), Microsoft 365 admin portal, or Microsoft 365 Groups Graph API will appear in Teams audit messages and in the General channel with an attribution to an existing owner of the team, and not to the actual initiator of the action. In these scenarios, consult Azure AD or Microsoft 365 Group audit logs to see the relevant information.

Related topics

- Search the audit log in the Microsoft 365 compliance center

Privacy and Microsoft Teams

6/29/2020 • 4 minutes to read • Edit Online

When an organization is considering relying on Microsoft Teams for communication and collaboration, privacy is something that needs to be addressed at every level. The questions we have below should address the privacy concerns you may have when planning your Teams implementation, or at any point during Teams usage.

What personal data does Microsoft Teams collect and for what purposes does Microsoft Teams use this data?

Microsoft processes the personal data in Microsoft Teams to deliver the agreed-upon services defined in the Online Services Terms and ultimately for the purposes determined by the data controller obtaining the service.Microsoft Teams, as a cloud-based service, processes various types of personal data as part of delivering the service. This personal data includes:

- **Content** Your meetings and conversations chats, voicemail, shared files, recordings and transcriptions.
- **Profile Data** Data that is shared within your company about you. Examples include your E-mail address, profile picture, and phone number.
- **Call History** A detailed history of the phone calls you make, which allows you to go back and review your own call records.
- **Call Quality data** Details of meetings and call data are available to your system administrators. This allows your administrators to diagnose issues related to poor call quality and service usage.
- **Support/Feedback data** Information related to troubleshooting tickets or feedback submission to Microsoft.
- **Diagnostic and service data** Diagnostic data related to service usage. This personal data allows Microsoft to deliver the service (troubleshoot, secure and update the product and monitor performance) as well as perform some internal business operations, such as:
  - Determine revenue
  - Develop metrics
  - Determine service usage
  - Conduct product and capacity planning

To the extent Microsoft Teams processes personal data in connection with Microsoft's legitimate business operations, Microsoft will be an independent data controller for such use and will be responsible for complying with all applicable laws and controller obligations.

Legal Basis of Processing

Our customers are controllers for the data provided to Microsoft, as set forth in the Online Services Terms, and they determine legal bases of processing.Microsoft, in turn, processes the data on the customers' instructions, as a processor.

To the extent Microsoft processes personal data in connection with its own legitimate business operations, as described in the Online Services Terms, Microsoft will be an independent controller for such processing, the legal basis of which is legitimate interests. "Microsoft's legitimate business operations" consist of the following, each as incident to delivery of Microsoft Teams to the customer: (1) billing and account management; (2) compensation (e.g., calculating employee commissions and partner incentives); (3)internal reporting and modeling (e.g., forecasting, revenue, capacity planning, product strategy); (4)combatting fraud, cybercrime, or cyber-attacks that may affect Microsoft or Microsoft Products; (5) improving the core functionality of accessibility, privacy or energy-efficiency; and (6)financial reporting and compliance with legal obligations.

What third parties have access to personal data?

Microsoft will not disclose personal data except:

1. as the customer directs (including as required to complete phone calls);
2. as described in the Online Service Terms (such as the use of authorized subcontractors to provide certain components of services);
3. as required by law.

If law enforcement contacts Microsoft with a demand, Microsoft will attempt to redirect the law enforcement agency to request that personal data directly from the customer. If compelled to disclose personal data to law enforcement, Microsoft will promptly notify the customer and provide a copy of the demand unless legally prohibited from doing so. For more information about data that we disclose in response to requests from law enforcement and other government agencies, please see our Law Enforcement Requests Report.

The Teams Security Guide has more information about our compliance standards.

Where does Teams transfer and store personal data?

Personal data is transferred and stored as set forth in the Online Service Terms.

For transfers of personal data from the EEA, EU, Switzerland, and the UK, Microsoft is certified to the EU-U.S. and Swiss-U.S. Privacy Shield Frameworks and the commitments they entail. Its Privacy Shield certificate is at this url.

We have information on the Location of data in Microsoft Teams if you need to learn more.

How long does Microsoft Teams retain personal data?

Microsoft Teams retains your data for the minimum amount of time necessary to deliver the service.

Because this data is required to provide the service, this typically means that we retain personal data until the user stops using Microsoft Teams, or until the user deletes personal data.If a user (or an administrator on the user's behalf) deletes the data, Microsoft will ensure that all copies of the personal data are deleted within 30 days.

If a company terminates service with Microsoft, corresponding personal data will all be deleted between 90 and 180 days of service termination.

In some circumstances, local laws require that Microsoft Teams retain telephone records (for billing purposes) for a specific period of time, in those circumstances Microsoft Teams follows the law for each region.

Additionally, if a company requests that Microsoft Teams hold a user's data to support a legal obligation, Microsoft will respect the company administrator's request.

Right to withdraw consent

If Microsoft Teams processes any personal data based on consent, you may have the right to withdraw your consent at any time. You should direct your request to withdraw consent to your administrator, where your administrator is the controller of the personal data at issue.

Contact Details of Microsoft's Data Protection Officer

If you have a privacy concern, complaint or question for the Microsoft Chief Privacy Officer and EU Data Protection Officer, please contact us by using our web form. Our EU Data Protection Officer is located at Microsoft Place, South County Business Park, Leopardstown, Dublin 18, Ireland. Telephone: +353 1 706 3117.You can also raise a concern or lodge a complaint with a data protection authority or other official with jurisdiction.

Skype for Business and Microsoft Teams data collection practices

9/14/2020 • 3 minutes to read • Edit Online

Skype for Business Server and Skype for Business Online, along with Skype for Business and Microsoft Teams apps, collect data to help Microsoft understand how these products are being used and what kinds of errors, such as sign-in errors, have occurred. This information helps us understand usage patterns, plan new features, and troubleshoot and fix problem areas.

While some usage data is collected automatically, other data can only be collected when the admin and/or user chooses to allow it. Data collection falls into these three categories:

- Census data
- Usage data
- Error reporting data

Census data

Census data is acquired solely to provide, support, and improve Skype for Business. Microsoft Teams, and Skype for Business Online. It includes environmental information such as device and operating system versions, and regional and language settings. It also includes counters for sign-in attempts and failures. Here are some specific examples of the census data that's collected:

DATA TYPE	EXAMPLE	NOTES
AppName	iPhoneSkype	
DeviceModel	iPhone	
OSName	iPhoneiOS	
OSVersion	8.3	
UserLanguage	EN-US	
UserID	E296D735-4F36-4E18-7C3B-52E1A02A0164	The ID is hashed twice: once on the client and again on the telemetry service. The hashing ensures the ID cannot be linked to a specific user.
DeviceID	5E872200-F546-4CCD-8F23-AF5F507AA2DD	The device ID is a GUID that's randomly generated once on the device and sent to the telemetry service.

Census data DOES NOT contain any information that identifies your organization or users. See the Skype for Business Privacy Statement for more information.

Census data is on by default and cannot be turned off by admins or end users.

Usage data

Usage data includes information such as number of calls made, number of IMs sent or received, number of meetings joined, frequency of features used, and stability issues.

Usage data might contain information that identifies your organization, such as contoso.com. Here are some specific examples of the usage data that's collected:

DATA TYPE	EXAMPLE	NOTES
IM Sent	12	
IM Received	5	
Join a meeting (attempts)	5	
Join a meeting (success)	4	
Call/meeting minutes	30 mins	
FederationPartner	Microsoft.com	This is the name of the organization registered in Office 365 and is transmitted in cleartext, which means it's not obfuscated.

Usage data DOES NOT contain any information that identifies users.

Usage data collection is on by default, but on-premises admins can turn it off using the DisableAutomaticSendTracing Group Policy setting on Skype for Business Server. Turning this setting off affects all users in the organization. See Configure client bootstrapping policies for more information.

End users cannot turn usage data collection on or off.

For Skype Meetings App and the join launcher web pages, the way to control telemetry is through this policy:

```
Set-CsWebServiceConfiguration -MeetingUxEnableTelemetry $True
```

This policy defaults to false, so telemetry collection is off by default. This setting is per-pool and controls all users who connect with Skype Meetings App to a meeting hosted on that server.

Error reporting data

Error reporting data can include information about performance and reliability, device configuration, network connection quality, error codes, error logs, and exceptions. Here are some specific examples of error reporting data that's collected:

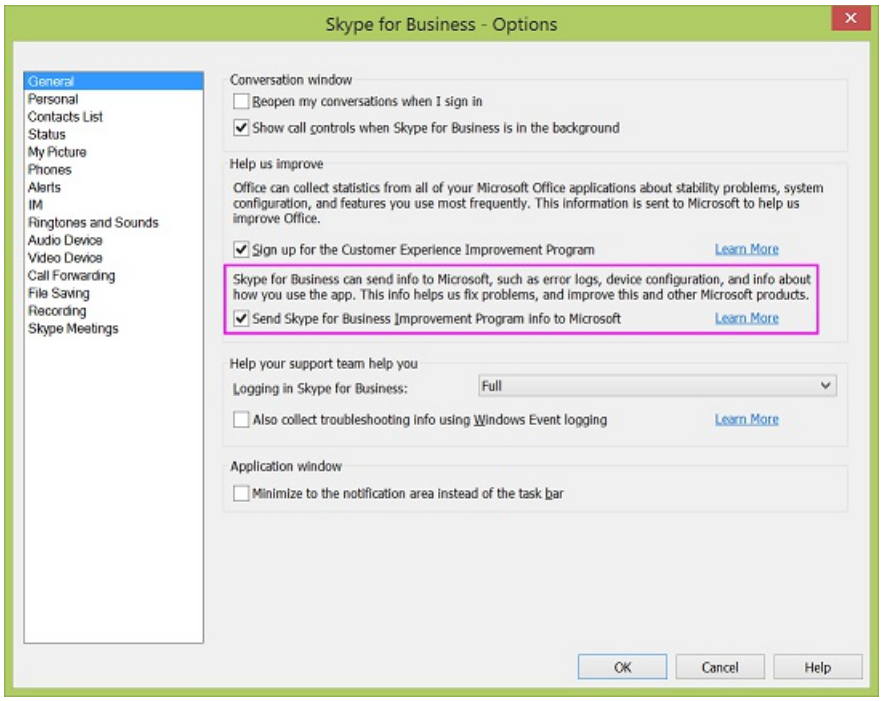
DATA TYPE	EXAMPLE	NOTES
Message direction	Incoming	
Conversation state	Idle	
Conversation thread ID	AdDO8hsJqilU93hQHC3OZaPR2saEA==	

DATA TYPE	EXAMPLE	NOTES
UserID	amosmarble	The ID is sent in cleartext , which the telemetry service hashes before storing it

Error reporting data may also contain personally identifiable information such as the user's IP address and Session Initiation Protocol Uniform Resource Identifier (SIP URI). See the Skype for Business Privacy Statement for a detailed explanation of what's collected.

Error reporting requires two things:

- The DisableAutomaticSendTracing Group Policy setting is set to False on the server or in the tenant admin center (this is the default state). See Configure client bootstrapping policies for more information.
- End users individually opt in from the General tab (click the gear icon and then the **Options** dialog opens with the **General** tab displayed) in the Skype for Business client.



For Skype Meetings App, the MeetingUxEnableTelemetry also controls error reporting, although for crashes on Windows, the Watson settings control uploading crash info. There is no user setting for Skype Meetings App like you see in the desktop client dialog box.

See Set General options in Skype for Business for more information.

You can see Set up your network for Skype for Business Online to set up your network.

If you are using Microsoft 365 or Office 365 operated by 21Vianet in China, see Set up your network for Skype for Business Online operated by 21Vianet.

Related topics

Country and region availability for Audio Conferencing and Calling Plans

Location of data in Microsoft Teams

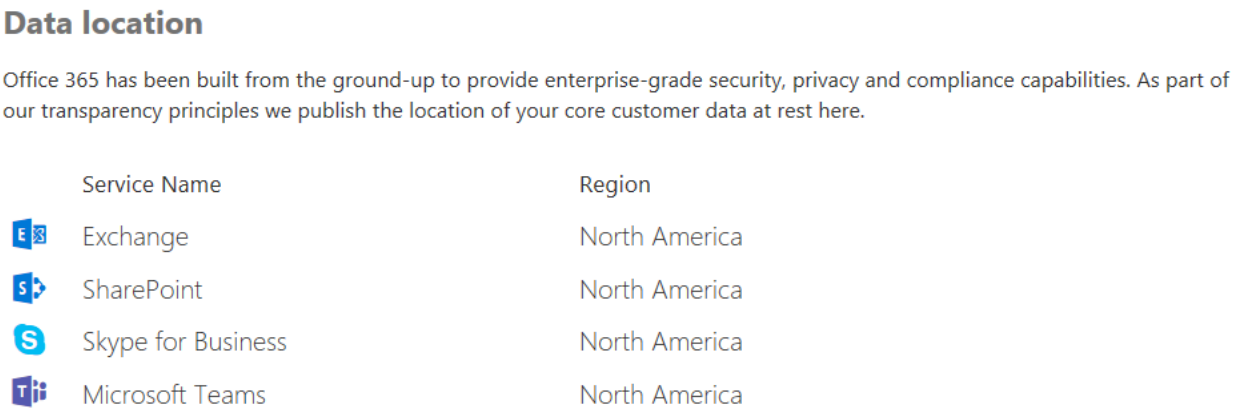
12/5/2020 • 2 minutes to read • Edit Online

Data in Teams resides in the geographic region associated with your Microsoft 365 or Office 365 organization. Currently, Teams supports the Australia, Brazil, Canada, France, Germany, India, Japan, Norway, South Africa, South Korea, Switzerland (which includes Liechtenstein), the United Arab Emirates, United Kingdom, Americas, APAC, and EMEA regions.

> **IMPORTANT**
>
> Teams currently offers data residency in Australia, Brazil, Canada, France, Germany, India, Japan, Norway, the United Arab Emirates, United Kingdom, South Korea, South Africa, and Switzerland (which includes Liechtenstein) for new tenants only. A new tenant is defined as any tenant that hasn't had a single user from the tenant sign in to Teams or its admin user has never signed in to the Teams admin center. Existing tenants from Australia, India, Japan, and South Korea will continue to have their Teams data stored in the APAC region. Existing tenants in Brazil and Canada will continue to have their data stored in the Americas. Existing tenants in France, Germany, Liechtenstein, Norway, the United Arab Emirates, the United Kingdom, South Africa, and Switzerland will have their data stored in the EMEA region.

Where your Teams data is stored

To see which region houses data for your tenant, go to the Microsoft 365 admin center > **Settings** > **Organization profile**. Scroll down to **Data location**.



Data location

Office 365 has been built from the ground-up to provide enterprise-grade security, privacy and compliance capabilities. As part of our transparency principles we publish the location of your core customer data at rest here.

Service Name	Region
Exchange	North America
SharePoint	North America
Skype for Business	North America
Microsoft Teams	North America

For a detailed list of countries and data stored, see Where your Microsoft 365 customer data is stored.

Data stored with a third-party storage provider

Organizations who allow users to store files with a third-party storage provider are dependent on the storage location of those services and should, therefore, review the location of data at rest for those services separately.

Block access to SharePoint for specific users

9/22/2020 • 2 minutes to read • Edit Online

Applying any Conditional Access (CA) policy on SharePoint in Microsoft 365 is also applied to Teams. However, some organizations want to block access to SharePoint files (upload, download, view, edit, create) yet allow their employees to use Teams desktop, mobile, and web clients on unmanaged devices. Under the CA policy rules, blocking Sharepoint would lead to blocking Teams as well. This article explains how you can work around this limitation and allow your employees to continue using Teams while completely blocking access to files stored in SharePoint.

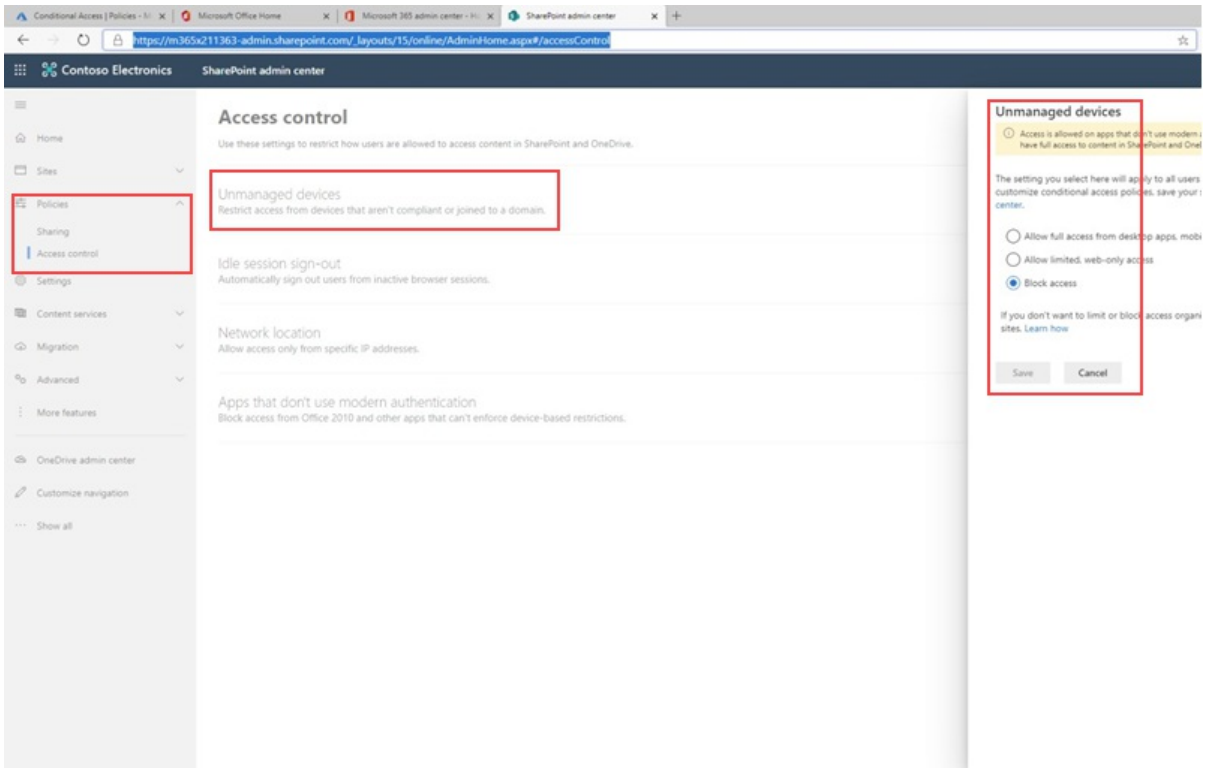
> **NOTE**
>
> Blocking or limiting access on unmanaged devices relies on Azure AD conditional access policies. Learn about Azure AD licensing. For an overview of conditional access in Azure AD, see Conditional access in Azure Active Directory. For info about recommended SharePoint Online access policies, see Policy recommendations for securing SharePoint sites and files. If you limit access on unmanaged devices, users on managed devices must use one of the supported OS and browser combinations, or they will also have limited access.

You can block or limit access for:

- Users in the organization or only some users or security groups.
- All sites in the organization or only some sites.

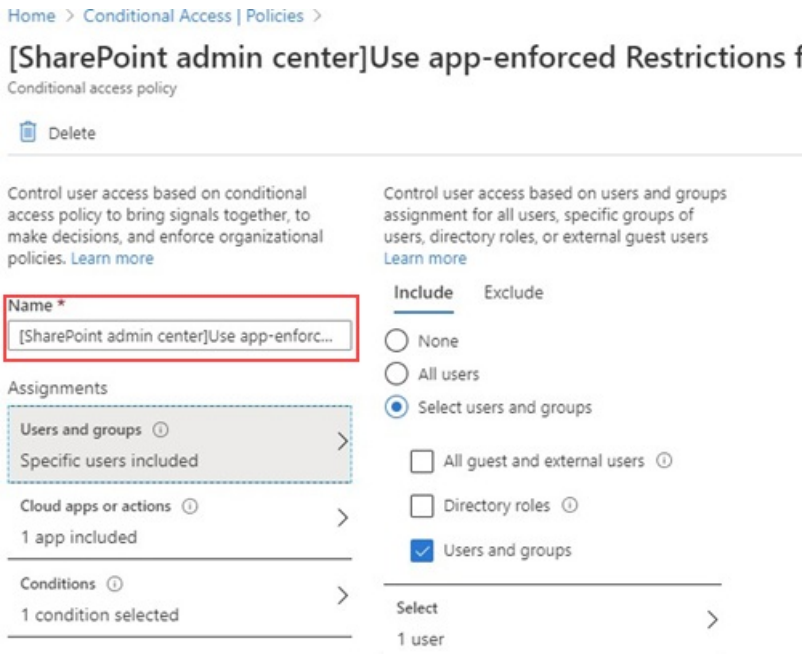
When access is blocked, users will see an error message. Blocking access helps provide security and protects secure data. When access is blocked, users will see an error message.

1. Open the SharePoint Admin Center.
2. Expand **Policies** > **Access Policies**.
3. In the **Unmanaged Devices** section, select **Block Access** and select **Save**.

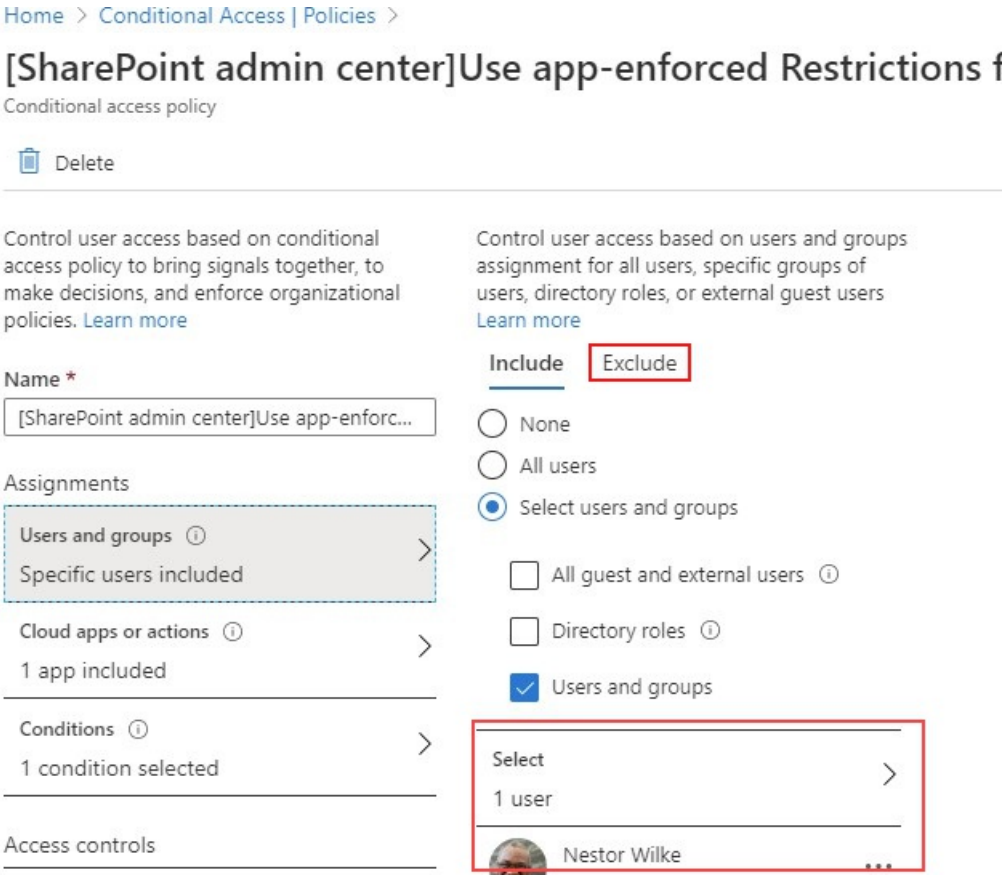


4. Open the Azure Active Directory portal and navigate to **Conditional Access Policies**.

   You'll see a new policy has been created by SharePoint that's similar to this example:



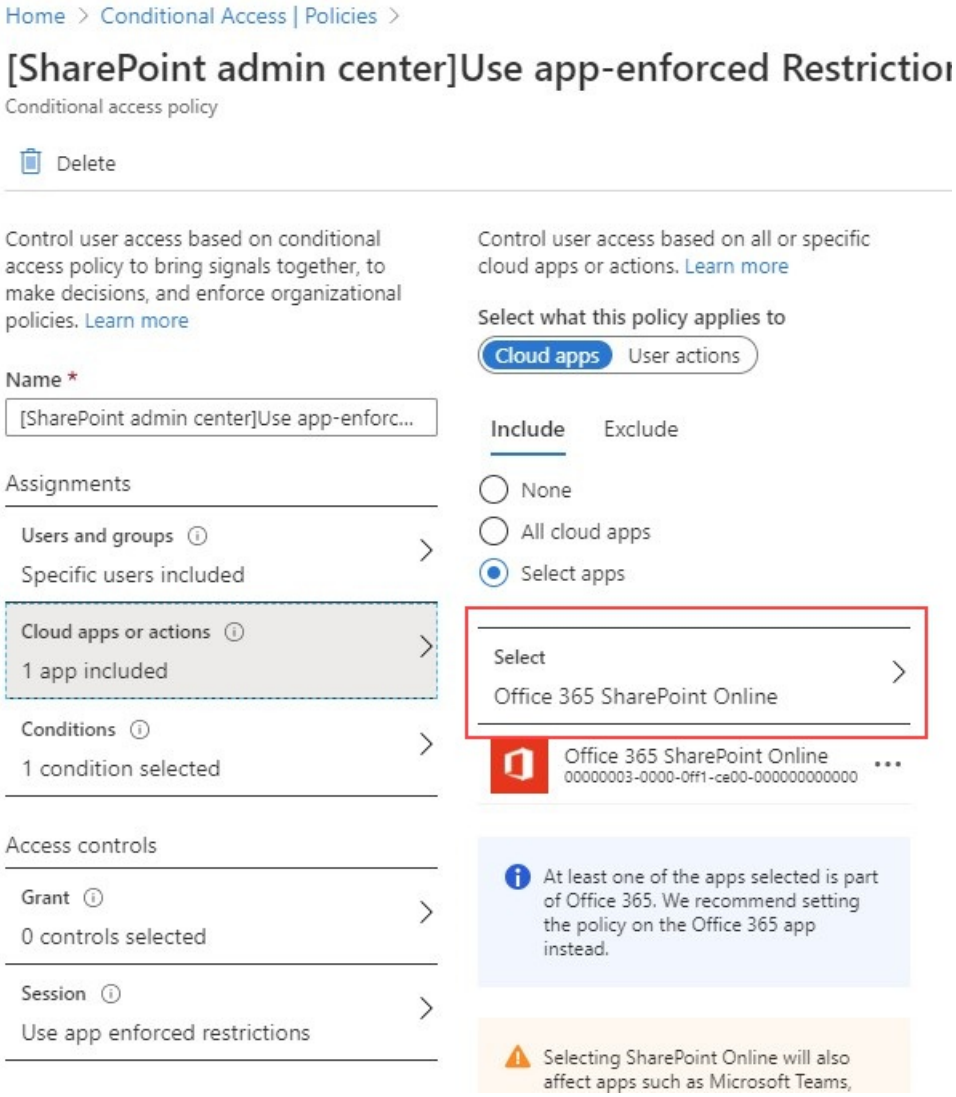
5. Update the policy to target only specific users or a group.



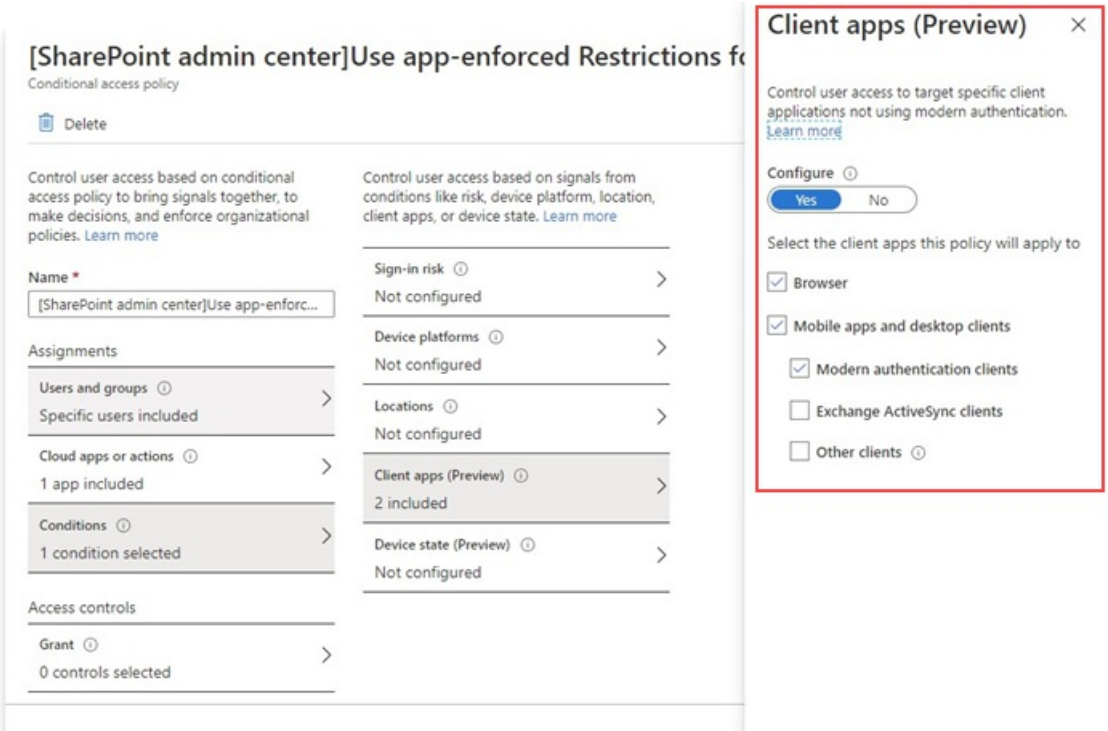
NOTE

Setting this policy will cut your access to the SharePoint admin portal. We recommended that you configure the exclusion policy and select the Global and SharePoint admins.

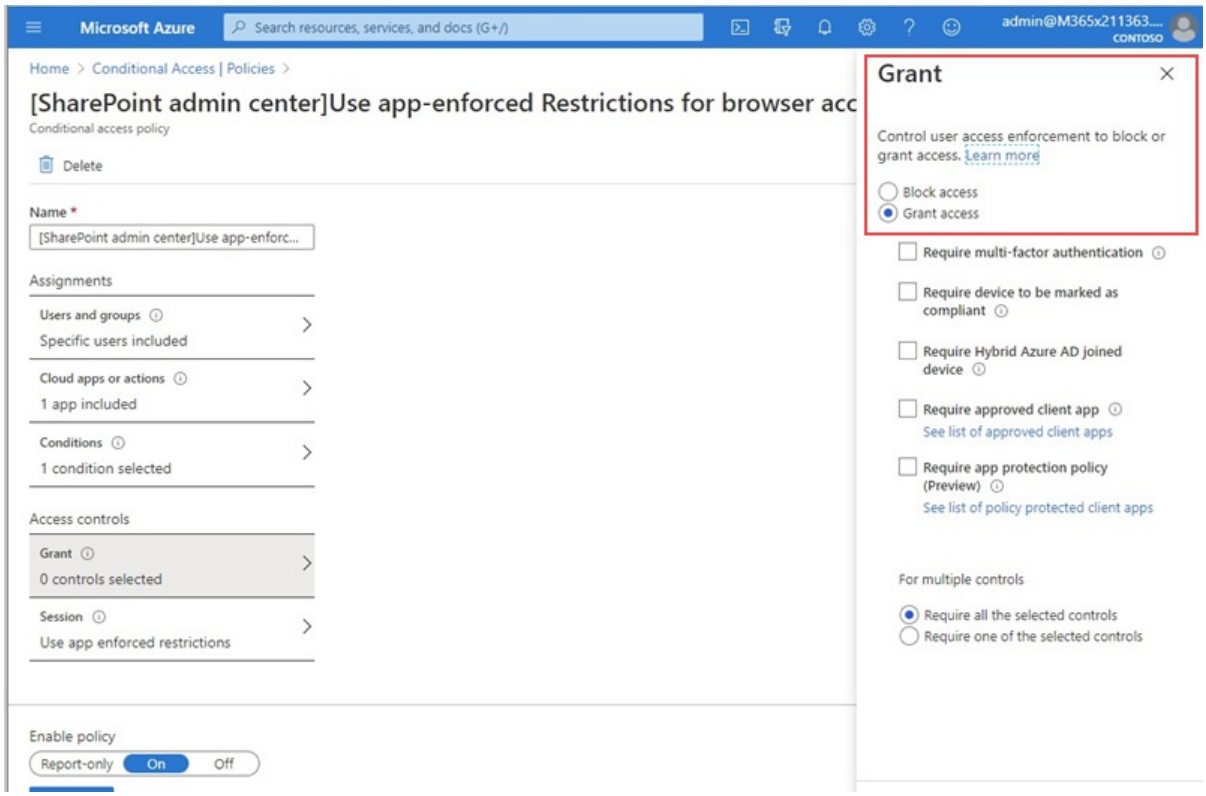
6. Verify that only SharePoint is selected as targeted Cloud App



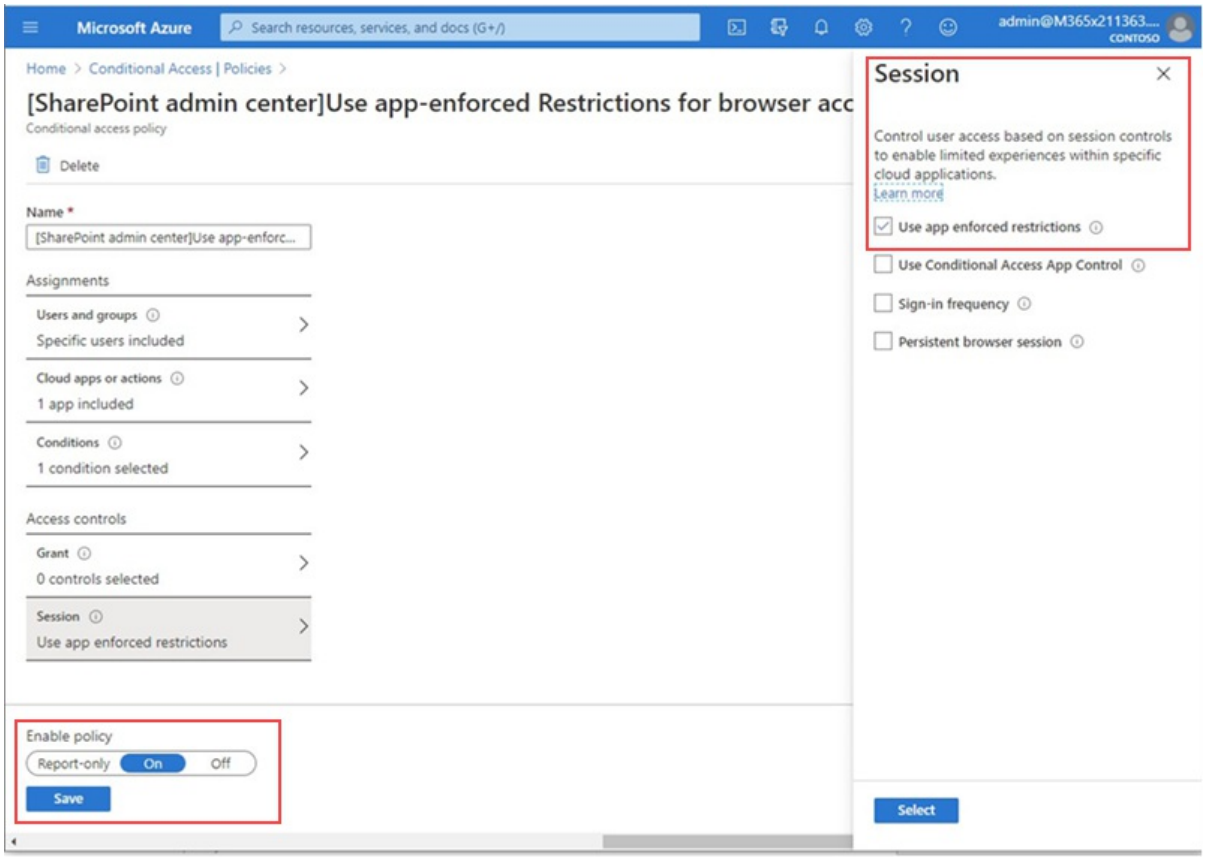
7. Update **Conditions** to include desktop clients, as well.



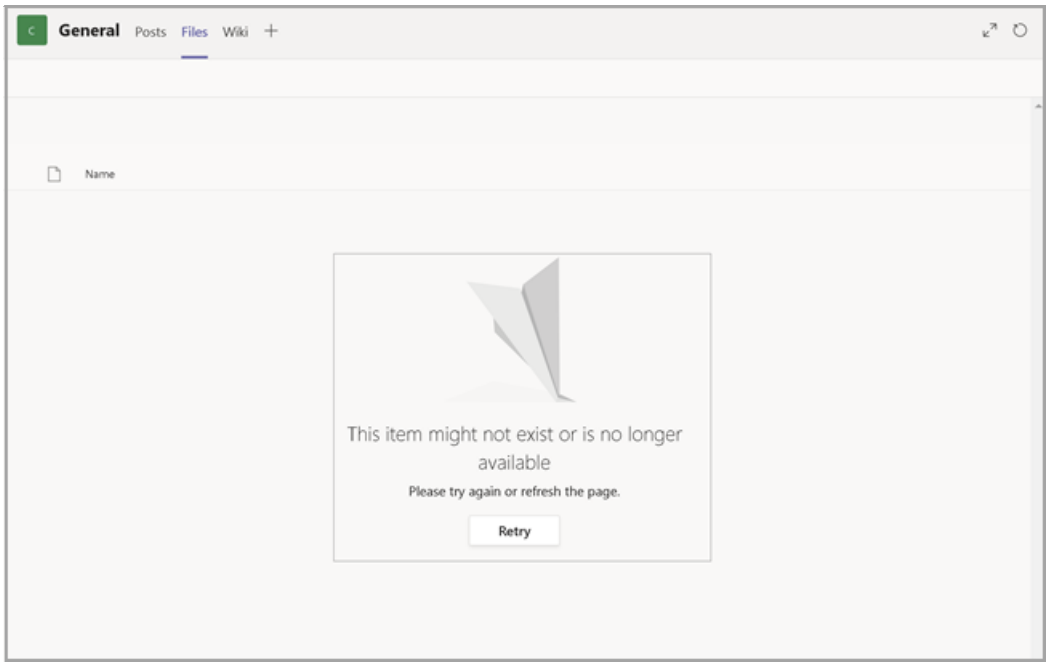
8. Make sure that **Grant access** is enabled



9. Make sure **Use app enforced restrictions** is enabled.
10. Enable your policy and select **Save**.



To test your policy, you need to sign out from any client such as the Teams desktop app or the OneDrive for Business sync client and sign in again to see the policy working. If your access has been blocked, you'll see a message in Teams that states the item might not exist.



In Sharepoint, you'll receive an access denied message.



Related topics

Control access for unmanaged devices in SharePoint

Policy control overview for Microsoft Teams

9/18/2020 • 4 minutes to read • Edit Online

Microsoft is committed to providing you with the information and controls you need to make choices about how your data is collected and used when you're using Microsoft Teams, a part of Microsoft 365.

This article is intended to provide you with information about privacy controls for the following areas:

- **Diagnostic data** that is collected and sent to Microsoft about Teams and Office software being used on computers running Windows in your organization.
- **Connected experiences** that use cloud-based functionality to provide enhanced Teams and Office features to you and your users.

As part of these changes, there are new and updated user interface (UI) elements and policy settings

> **IMPORTANT**
> For further reading, please review the Policy Control Overview content for M365.

Diagnostic data sent from Microsoft 365 Apps for enterprise to Microsoft

Diagnostic data is used to:

- Keep Teams secure and up-to-date.
- Detect, diagnose and remediate problems.
- Make product improvements.

An example of some of the collected data includes:

- Application language
- User type
- Build version of the OS

Clients that adhere to diagnostic controls

The following clients adhere to diagnostic controls and will submit data:

- iOS
- Android
- Desktop (only the component that is using the win32 API)

For required mobile data diagnostics, see Policy control diagnostic data for mobile.

For required desktop data diagnostics, see Policy control diagnostic data for desktop.

Diagnostic data sent from the Teams app to Microsoft

This diagnostic data is collected and sent to Microsoft about Teams software being used on computers running Windows in your organization.

There are three levels of diagnostic data for Teams software that you can choose from:

- **Required** The minimum data necessary to help keep Office secure, up-to-date, and performing as expected on the device it's installed on.
- **Optional** Additional data that helps us make product improvements and provides enhanced information to help us detect, diagnose, and remediate issues.
- **Neither** No diagnostic data about Teams software running on the user's device is collected and sent to us. This option, however, significantly limits our ability to detect, diagnose, and remediate problems your users may encounter using Teams.

Required diagnostic data could include, for example, information about the version of Teams client installed on the device, or include information that indicates that the Teams application is crashing when trying to join a meeting. Optional diagnostic data could include information about the time it takes to initiate a phone call, which could indicate an issue with connectivity or network performance.

If you choose to send us optional diagnostic data, required diagnostic data is also included.

As an admin for your organization, you'll be able to use a policy setting to choose which level of diagnostic data is sent to us. Optional diagnostic data will be sent to Microsoft unless you change the setting. Providing optional diagnostic data better enables the Office engineering team at Microsoft to detect, diagnose, and mitigate issues to reduce impacts to your organization.

Your users won't be able to change the diagnostic data level for their devices if they are signed in to Teams with their organizational credentials, which is sometimes referred to as a work or school account.

This diagnostic data doesn't include names of users, their email addresses, or the content of their Office files. Our system creates a unique ID that it associates with your user's diagnostic data. When we receive diagnostic data showing that the Teams app crashed 100 times, this unique ID lets us determine if it was a single user who crashed 100 times or if it was 100 different users who each crashed once. We don't use this unique ID to identify a specific user.

Required service data for connected experiences

Required service data is data that enables us to deliver these cloud-based connected experiences and help make these experiences secure and perform as expected. Three types of information make up required service data.

- **Customer content**, which is content you create using Office, such as text typed in a Word document.
- **Functional data**, which includes information needed by a connected experience to perform its task, such as configuration information about the app.
- **Service diagnostic data**, which is the data necessary to keep the service secure, up to date, and performing as expected. Because this data is strictly related to the connected experience, it is separate from required or optional diagnostic data levels.

You can choose to not offer this functionality to your users, in which case this information will not be provided to Microsoft to support the functionality of connected experiences. You can learn more about required service data.

Essential services for Microsoft Teams

There are also a set of services that are essential to how Microsoft 365 Apps for enterprise functions and cannot be disabled. For example, the licensing service that confirms that you are properly licensed to use Microsoft 365 Apps for enterprise. Required service data about these services is collected and sent to Microsoft, regardless of any other policy settings that you have configured.

For more information, see Essential services for Office.

Required mobile diagnostic data for Microsoft Teams

9/18/2020 • 65 minutes to read • Edit Online

The following article contains a list of Microsoft Teams mobile events, and lists of properties each event collects.

Events

> **NOTE**
> There are common properties for all events listed below, to review them, see Properties sent with all events.

PanelAction

> **NOTE**
> For information on the properties of PanelAction events, see Properties sent with panelaction events.

- **accessibilityUserConfiguration** - When a users toggles an accessibility feature.
- **acknowledgeSettingChange** - Acknowledge an update in the we updated a notification setting dialog. This is a feature success metrics used to acknowledge update notifications and to determine overall notification reliability.
- **actionComposeMenu**
  - Create message extension usage.
  - Action message extension usage.
- **active_session_banner_dismissed** - The location sharing active reminder banner was dismissed.
- **activityChatClicked** - Triggered when non-live chat is selected in the **Activity** tab or a split view is shown.
- **activityContextMenu** - Overflow actions in the activity feed.
- **activityFeedClick** - An activity feed item is tapped on and a bot chat is navigated to.
- **activityFeedLongPress** - Captures long press gestures on feed items.
- **activityFeedSwipe** - Captures swipe gestures on feed items.
- **activityFilterClick** - Captures activity filter usage.
- **activityFilterOptionsClick** - Captures activity filter usage.
- **activityFilterOptionsClicked** - Captures activity filter usage.
- **activityLiveChatClicked** - Triggered when chat is selected from a live meeting on the **Activity** tab.
- **activityLiveDetailsClicked** - Triggered when **Details** is selected from a live meeting on the **Activity** tab.
- **activityTabClicked** - Helps to determine if:
  - The **Activity** tab is shown.
  - Teams captures an **Activity** tab event.
- **activityTypeDropdown** - Captures activity filter usage to switch between **My Activity** and **Feeds**.

- **addChannel** - Adding a channel. This item provides success data around the successful creation of a channel.
- **addMember** - Triggered the **Invite people** button is selected in the **More** menu.
- **addMembers** - Add members to a team or private channel.
- **addToCalendar** - Select the **Add to calendar** button for calendar events missing in private calendar.
- **addToList** - A contact is added to a contact list.
- **addToMeeting** - Select the **Add to meeting** button in the participant list for a meeting (for participants who are a part of the chat).
- **addUserAsContact** - A contact can be added by selecting the **Add contact** icon from the profile card of the contact.
- **admitAll** - The number of times the **Admit all** button is selected from the lobby section.
- **admitParticipant** - The number of times someone is admitted into a meeting from the meeting roster.
- **alertsNavAlert** - Tapping on a feed item.
- **android: null** - Mute or unmute a bot chat. This is enhancing existing telemetry around chats only adds application information.
- **anonymousMeetingJoin** - **Join meeting** is selected on an anonymous join provide name page or **OK** is tapped in the name dialog.
- **anonymousMeetingJoinWelcome** - **Join as guest** is selected on an anonymous join meeting landing page.
- **anonymousMeetingPostMeetingChat** - The number of user views of chat from the call end screen.
- **anonymousMeetingPostMeetingRejoin** - The number of times an anonymous user tries to rejoin a meeting.
- **anonymousMeetingSignIn** - The number of times a user navigated to sign-in from the name input screen.
- **anonymousMeetingSignInWelcome** - The **Sign in and join** is selected on an anonymous join meeting landing page.
- **anonymousMeetingToggleMuted** - The number of times the mute toggle button was selected.
- **anonymousMeetingToggleVideo** - The number of times the video toggle button was selected.
- **appKilled** - The application is terminated.
- **approveTimeOffRequest** - When a FirstLine Worker (FLW) Manager approves a FirstLine Worker request to take time off.
- **assigneeChange** - Triggers when a new assignee is added to a task item.
- **assignmentPickerClicked** - The **Assign To** button is selected, opening an assignee picker page.
- **assignmentRemoved** - Triggers when an assignee is removed from a task item by selecting the **x** (which is the only way to remove an assignee).
- **attachmentAdded** - Confirms that an attachment in a task was successfully added.
- **attachmentDeleted** - Confirms that an attachment in a task was successfully deleted.

- **attachmentUpdated** - Confirms that an attachment in a task was successfully updated.
- **audioOnlyLowBatteryBanner** - The **Audio only** option is selected due to a low battery banner.
- **audioOnlyPoorNetworkBanner** - The **Video off** option is selected due to a poor connection banner.
- **audioUserDoubleTap** - Double tap on an audio participant.
- **autoReconnectCallmebackCallDrop** - The number of times the **Callmeback** button was selected at a call end screen.
- **autoReconnectDialIn**
  - The **Dial in** button is selected on the reconnect UFD.
  - The number of times the **Dial In** button was selected while a reconnect is happening.
- **autoReconnectDialInonCallDrop** - The **Dial in** button is selected on the call disconnected UFD.
- **autoReconnectDialOut** - The **Call me back** button is selected on the reconnect UFD.
- **autoReconnectRejoinonCallDrop** - The number of times the **Rejoin** or the **Redial** button was selected at the call end screen.
- **backFromCallMePSTN** - Call Me back PSTN number flow is not completed.
- **backToPhotoShare** - Returning to a camera.
- **backToStageFromWhiteboard** - Returning to a call screen from a whiteboard.
- **backToWhiteboardFromStage** - Going to a whiteboard from a call screen.
- **blockAnonymous** - When:
  - Enables calling setting to block calls without caller id from settings.
  - Disables calling setting to block calls without caller id from settings.
  - Enables calling setting to block calls without caller id from action sheet.
  - Disables calling setting to block calls without caller id from action sheet.
- **blockCaller** - Blocking:
  - A number and contact from the new iOS calls action sheet.
  - A contact and number from the contact card.
  - Numbers from settings.
- **blockChat** - Blocking a bot chat. This enhances existing telemetry around chats and is only adding application information.
- **botClickCardAction** - Connector card usage.
- **brbFeedback** - Relating to the performance of the BRB feedback form.
- **brbFormCancelled** - An event sent when the BRB feedback form is cancelled and the user returns to the app.
- **brbFormOpened** - An event sent when the BRB form is opened.
- **brbFormSubmit** - An event sent when the user selects **Submit** on the feedback form.
- **breakStartEndClicked** - On the clock in screen, the **Start** or the **End break** button is selected.
- **breakStartEndTriggered** - Register a user chooses to use break start or end.
- **bucketSelected** - Confirms that a bucket has been successfully selected.

- **bucketUnselected** - Confirms that a bucket has been successfully unselected.
- **bucketPickerClicked** - Confirms that the bucket picker successfully launched.
- **BYOELiveEventJoin** - BYOE (broadcast your own event) live event is joined by a user.
- **calendarLiveChatClicked** - Chat from live meeting on the **Schedule** tab.
- **calendarMeetingJoin** - **Meeting Join** button selected from a calendar.
- **calendarTab** - Select the **Meetings** tab in the bottom rail. Useful in understanding the calendar usage and comparing with other apps on the bottom rail, or determining if there was a failure in rendering the calendar post after selecting from the bottom bar.
- **calendarTabClicked** - In the circumstances listed below, this will show calendar usage and allow you to compare with other navbar apps on the bottom rail. This can be used to determine if there was a failure when:
  - The **Schedule** tab is shown.
  - The **Meetings** tab is selected in the bottom rail.
- **calendarUpcomingChatClicked** - Chat from an upcoming meeting on the **Schedule** tab.
- **callAccepted** - Call accepted.
- **callAcceptedSFB** - Call accepted.
- **callAppPreference** - A preferred calling App is selected.
- **callControlsManualDismiss** - Call controls are dismissed manually.
- **callControlsManualInvoke** - Call controls are invoked manually.
- **callHistoryItemExpand** - Call History item expanded.
- **callHistoryTab** - **CallHistory** tab is selected in Calls.
- **callInProgressShown** - A ***Call in progress** banner is shown.
- **callMePSTNConnected** - **Call me** is successful.
- **callOrMeetUpAddParticipants** - Triggered when:
  - Add participant button is tapped on a 1:1 call screen.
  - Select Person (VoIP) in Add participants.
  - Select PSTN in Add participants.
  - Add people in a live private meeting.
  - Select PSTN in a live private meeting.
  - Select Company contact in a live Private meeting.
  - Select Device contact in a live private meeting.
  - Add Participants Done in a live private meeting.
  - Add people in a live channel meeting.
  - Select PSTN in a live channel meeting.
  - Select Team Member in a live channel meeting.
  - Select Device contact in a live channel meeting.
  - Add Participants Done in a live channel Meeting.
- **callOrMeetUpAddParticipantsDone** - A user finalizes their participant addition.
- **callOrMeetUpAddRoom** - Triggered when:

    - **Add room** is selected in roster.
    - A search result is selected in add room.
    - **Dismiss** is selected for Nearby.
    - **Enable BT** or **Location** is selected for Nearby.
    - A nearby room result is selected in add room.
    - A suggested room result is selected in add room.
    - **Done** is selected in add room.
- **callOrMeetUpAudioOffSwitch** - Flip **Audio off** button while in companion join mode in a live call or meetup.
- **callOrMeetUpAutoReconnect** - Poor network performance causes a user's device to go into Autoreconnect mode.
- **callOrMeetUpCallAccepted** - Triggered when:
    - A call is accepted.
    - A PSTN Call is accepted.
- **callOrMeetUpCallEnded** - Triggered when:
    - An **End call** button is tapped.
    - A **Call ended** button is tapped while in callOrMeetupLive.
    - A **Call ended** button is tapped while in lockScreen.
    - A **Call ended** button tapped while in notification.
    - A **Call ended** button tapped while in inApp.
    - A **Call ended** button tapped while in callKit.
    - A **Call Ended** button for PSTN tapped.
- **callOrMeetUpChatWithParticipants** - Chat toggle while in live meeting or call.
- **callOrMeetUpDeviceAudioSwitch** - Triggered when:
    - Switch audio source to speaker.
    - Switch audio source to device.
    - Switch audio source to Bluetooth.
    - Switch audio source to audio off.
    - Switch speaker while in live meeting or a call.
    - Switch speaker to Audio off while in live meeting or a call.
    - Flip **Audio off** button while in companion join mode in live call or meetup.
    - Device Audio Switch while in PSTN.
- **callOrMeetUpEnterDriveMode** - Switches manually to drive mode from the **...** menu.
- **callOrMeetupExitDriveMode** - **Exit drive mode** button tapped.
- **callOrMeetUpHold** - Triggered when:
    - The **Hold** button is tapped while in live meeting or a call.
    - Call Hold in PSTN.
- **callOrMeetUpIncomingVideoSwitch** - Turn off IncomingVideo while in live meeting or a call.
- **callOrMeetUpInvitedParticipants** - Triggered when:
    - Clicked **See all** at the bottom of an **Others invited** participant group during private live meeting.
    - Clicked **See all** at the bottom of an **Others invited** participant group during live channel meeting.
- **callOrMeetUpJoinedParticipants** - Triggered when:

    - Clicked **See all** at the bottom of an **In the meeting** participant group during private live meeting.
    - Clicked **See all** at the bottom of an **In the meeting** participant group during live channel meeting.
- **callOrMeetUpLobbyParticipants** - Triggered when:
    - Clicked **See all** at the bottom of a **Lobby** participant group during private live meeting.
    - Clicked **See all** at the bottom of a **Lobby** participant group during live channel meeting.
- **callOrMeetUpMicrophoneSwitch** - Triggered when:
    - Switch Microphone on.
    - Switch Microphone off.
    - **Microphone** button is selected while in a live meeting or a call.
    - Microphone switch while in PSTN.
- **callOrMeetUpMuteParticipant** - A remote participant is muted.
- **callOrMeetUpMuteParticipants** - Mute all participants while in live meeting or a call.
- **callOrMeetUpParticipants** - Participants toggle while in live meeting or a call.
- **callOrMeetUpRemoteMuteUFD** - You have been muted UFD.
- **callOrMeetUpResume** Triggered when:
    - **Resume** button is selected while in a live meeting or a call.
    - Call Resume in PSTN.
- **callOrMeetUpSearchParticipants** - Triggered when:
    - Clicked **Search** in meeting participants during private live meeting.
    - Clicked **Search** after viewing the **Lobby** participant group during private meeting.
    - Clicked **Search** after viewing the **In the meeting** participant group during private meeting.
    - Clicked **Search** after viewing the **Others invited** participant group during private meeting.
    - Clicked **Search** in meeting participants during a live channel meeting.
    - Clicked **Search** after viewing the **Lobby** participant group during a live channel meeting.
    - Clicked **Search** after viewing the **In the meeting** participant group during a live channel meeting.
    - Clicked **Search** after viewing the **Others invited** participant group during a live channel meeting.
- **callOrMeetUpVideoSwitch** - Triggered when:
    - Switch Video on.
    - Switch Video off.
    - Video button selected while in live meeting or call.
- **callPark** - Triggered when:
    - **Park Call** is selected in the **...** menu.
    - **Retrieve** button is selected.
    - **Pickup** is selected in the retrieve dialog.
    - **Cancel** is selected in the retrieve dialog.
- **callPreferenceSetting** - Call preference app setting.
- **callsTabNewCall** - **New Call** is selected in the **Calls** tab.
- **callTransfer** - A call transfer is started.
- **callVoicemailTab** - **Voicemail** tab selected in Calls.
- **cameraPermissionCancel** - **Cancel** is selected the camera permission dialog.

- **cameraPermissionGoToSettings** - **Settings** is navigated to from the camera permissions dialog.
- **cancelEditMeeting** - Select the **Close** button while on the meeting scheduler page, after selecting **Edit meeting**. This logs when a user abandons the edit meeting selection.
- **cancelFileShare** - **Cancel** is selected on the confirmation dialog.
- **cancelFileUpload** - **x** is selected on the upload dialog.
- **cancelMeeting** - Select **Cancel event** from the meeting details page. Used to get aggregated data on the number of cancelled meetings.
- **cancelNavigationToLink** - Cancel navigation was chosen.
- **cancelRequestToJoinTeam** - Cancel request to join a team.
- **cancelRequestToJoinTeamError** - Error with a cancel join request.
- **cancelNewMeeting** - To log abandoned Create meeting selections and verify what caused them when:
  - The **Close** button is selected while on meeting scheduler page.
  - The **Close** button is selected while on meeting scheduler page after selecting **Edit meeting**.
- **cardView - No AS assigned** - Card view and card rendering. Cards are key platform constructs and measuring their usage and pattern is necessary to understand platform usage and keep a look out for potential issues on the client side. This item is required to measure any error with joining a team.
- **castPpt** - Event is triggered when:
  - A PowerPoint option is selected.
  - A particular PowerPoint is selected.
  - The Teams and Channels folder is selected in the file picker page.
  - Selects a OneDrive folder in the file picker page.
  - Stops the casting session.
  - Taps on multitasking PiP.
  - Selects a display option from file view.
- **castScreen** - Refers to:
  - Tapping on share screen option.
  - Stopping the screen sharing session.
  - Selecting display option from file view.
- **center_on_team_clicked** - A user successfully centers map on groups.
- **channelFollow** - Turn on notifications for a channel.
- **channelUnfollow** - Turn off notifications for a channel.
- **channelsActiveSetting** - The **notify me when I'm active on desktop** notification setting is changed.
- **chatCreation** - Successful chat creation.
- **changeIsActiveSetting** - Change desktop activity based notification.
- **channel** - New message button or textbox in chat.
- **channelDetails** - Channel navigation information for when:
  - A channel header is selected.
  - The channel details page is navigated to.
- **channelFollow/channelUnfollow** - Follow or unfollow a channel.

- **channelNav** - Navigating to a channel from anywhere.
- **channelNavTab** - Provides success and discoverability data for files in Teams when:
  - The **Files** tab is selected in channel.
  - There is a connector card reply.
- **channelNotificationSettings** - Triggered when:
  - The **New Notification settings** dialog is selected.
  - The channel notification settings button is selected in channel view.
  - A channel notification setting is selected.
- **channelSelected** - Confirms that a channel was successfully selected for a new plan.
- **channelSendMessage** - Triggered when:
  - A channel message is sent.
  - A bot is @mentioned in a compose box.
- **channelTabOverflow** - Selects the **More** tab in a channel.
- **chat** - Refers to:
  - A new message button or textbox in chat.
  - 1:1 chat selected on a callHistory item.
  - A 1:1 chat selection from call list.
- **chat - No AS Assigned** - Viewing unread chat or editing the chat roster, specifically:
  - Selecting the **Done** button when adding a user to a chat.
  - A chat list filter is selected, to filter by unread.
- **chatAddChat** - Add a member to chat button tapped (this will be same for 1:1 chat and group chat).
- **chatAllowJoinViaLink** - Turns the Join Link capabilities in the Chat Details page on or off.
- **chatAvatarEdit** - Tracks how many groups change their avatar from the Chat Details page.
- **chatAvatarEditCamera** - Triggered when a user edits the avatar from a live camera feed.
- **chatAvatarEditGallery** - Triggered when a user edits the avatar from the phone's gallery.
- **chatAvatarEditView** - Triggered when a user views the existing avatar image.
- **chatListNavConversations** - When a user taps into a chat list item.
- **chatCancelAudioCall** - Cancel a group audio call - Confirm dialog.
- **chatCancelVideoCall** - Cancel a group video call - Confirm dialog.
- **chatCM_CopyText** - Tap **Copy text** on a chat context menu.
- **chatCM_DeleteMessage** - Tap **Delete message** on a chat context menu.
- **chatCM_edit** - Tap **Edit** on a chat context menu.
- **chatCM_Forward** - Tap **Forward** on a chat context menu.
- **chatCM_markUnread** - Tap **Mark as unread** on a chat context menu.
- **chatCM_save** - Tap **Save** on a chat context menu.
- **chatCM_SeenBy** - Tap on **Seen** on a context menu option. Read Receipts, such as read by (readby).
- **chatContactsEnter** - The **Chat Contacts** tab is entered.

- **chatDetails** - Provides success and discoverability data for a chat details page when:
  - A chat header is selected.
  - A chat detail page is navigated to.
- **chatRecentEnter** - The **Chat Recent** tab is entered.
- **chatSendMessage** - Send a chat message.
- **chatShareLink** Tracks how many users send a group invite link.
- **chatStartAudioCall** - Triggered when:
  - 1:1 audio call button tapped.
  - Taps the **Audio** button on a search result.
  - Taps the **Start Call** button on the right.
  - 1:1 audio call tapped from a callHistory item.
  - 1:1 audio call tapped from a voicemail item.
  - Place a group audio call - Confirm dialog.
- **chatStartAudioCallOnBehalfOf** - Delegate starts a call from the action sheet as Boss.
- **chatStartAudioCallOnBehalfOfMyself** - Delegate starts a call from the action sheet as Myself.
- **chatStartAudioCallSFB** - 1:1 audio call button tapped.
- **chatStartVideoCall** - Triggered when:
  - 1:1 video call button tapped.
  - Taps video button on search result.
  - 1:1 video call tapped from callHistory item.
  - Place a group video call - Confirm dialog.
- **chatStartVideoCallSFB** - 1:1 video call button tapped.
- **chatWithMeetingParticipants** - Selects the **Chat** tab from Meeting Details page.
- **checkListAddClicked** - **Add an item** is selected inside the task details view for checklist section.
- **checkListItemAdded** - A checklist item is created for a task.
- **checkListItemDeleted** - A checklist item is deleted from a task.
- **checkListItemUpdated** - A checklist item is updated for a task.
- **channelPickerClicked** - Confirms that the channel picker successfully launched.
- **checklistSeeAllClicked** When the **See All** button is selected inside task details to view all checklist items.
- **chicletExpand** - Understand how cards are previewed on mobile and the preview closure behavior.
- **clearFilter** - When all filters are cleared while viewing a tasklist.
- **clickPhotoOfficeLens** - Select **Take photo** - Launch camera (Android only).
- **clockInEntryTeamSelectionShown** - A user selects a team for time clock while not clocked in.
- **clockInOutClicked** - On the clock in screen, the **Clock In** or **Clock Out** button are selected.
- **clockInOutTriggered** - Register a user's clock in or out. This will not trigger until you have checked the location, assuming location is required.
- **closedBannerMessage** - Triggered when the banner message of a notification is closed.

- **closeLobbyBanner** - Number of times the lobby toast is closed using its **Close** button.
- **commentAdded** - Confirms that a comment was added to a task.
- **commentsClicked** - Confirms that the comments view was successfully launched.
- **commentUpdated** - Confirms that a comments was successfully updated on a task.
- **companionBannerJoin** - Select **Join** on the top-level banner.
- **companionDismiss** - Dismiss the companion banner.
- **companionDismissProximity** - Dismiss the companion banner.
- **companionJoin** - Join as companion option is selected on the sheet.
- **companionJoinProximity** - Joined through tje companion banner.
- **completionStateChange** - Triggers when a completed or uncompleted filter toggle is selected in filter view from task list.
- **composeExpandComposer** - **Format** button tapped.
- **composeFilePick** - Native file picker launched.
- **composeImagePicker** - **Image** button tapped.
- **composeLocation** - **Location** button tapped in compose.
- **composeMention** - @mention.
- **composeOpenEmoticonPicker** - Emoticon picker tapped.
- **composeOpenFunPicker** - Fun picker tapped.
- **composeParticipantAdded** - When a participant is added to the Shifts app.
- **composeSearchResult** - Message extension result selection, which is helpful to understand the app search result relevance. Also enhances message send telemetry with app data.
- **composeSelectExtension** - Tap on a ME app.
- **composeSendMessage** - Enhances message send telemetry with app data.
- **confirmAudioOn** - A user confirms that they want audio on.
- **confirmFileShare** - **Share** is selected on the confirmation dialog.
- **consultTransfer** - Triggered when:
  - Selects **Transfer** > **Consult first**
  - Transfer target set to Person
  - Transfer target set to Phone Number.
- **consultTransferCall** - Triggered when:
  - A consult call is initiated.
  - Confirm is selected on a confirms transfer dialog.
  - Cancel is selected on a confirms transfer dialog.
  - The **Banner transfer** button is selected.
  - The **Banner resume** button is selected.
- **consultTransferChat** Triggered when:

    - A consult chat is initiated.
    - Confirm is selected on a confirms transfer dialog.
    - Confirms is selected on a confirms transfer dialog.
    - A **Banner transfer** button or **Banner resume** button is selected.
- **consumeVoiceMessage** - Voice message played.
- **ContactCard_SeeMoreOOF** - See more of a long OOF message.
- **contactOrganizer** - Selected **Contact organizer**.
- **conversation, tabs** - Tab selected.
- **copyLink** - Copy a link to a channel post.
- **contactActivity** - When the button to view a user's activity from the contact card is selected.
- **conversation** - When a user navigates to the **Chat** or **Posts** tab.
- **createChannel** - Provides success data around the successful creation or discard action for new channel creation, when:
    - The **Done** button is selected on the **Create Channel** Page.
    - The **Cancel** button is selected on the **Create Channel** Page.
- **createComposeExtension** - Create message extension usage, or action ME usage.
- **createConversationClicked** - When a conversation is created with other workers.
- **createDefaultPlannerPlan** - A shared list is created automatically when the Tasks app is opened for the first time by anyone in that group, checks auto list created with Planner service. Confirms the default shared task list is successfully created in Planner the first time a user attempts to create a shared task list.
- **createOrJoinTeam** - The **+** button is selected to create or join a team.
- **createPersonalPlan** - A personal list is created, checks list created with ToDo service. Confirms a new personal task list is created in ToDo.
- **createPersonalSubtask** - Confirms a personal sub-task has been successfully created.
- **createPersonalTask** - Confirms a personal task has been successfully created.
- **createPlan** - Confirms that a shared task list has been successfully created. Confirms that a shared plan has been successfully created through middle tier.
- **createPlannerPlan** - A shared list is created, checks list created with Planner service. Confirms a new shared task list is created in Planner.
- **createPlannerTask** - Checks a call to the Planner service. Confirms that a task has successfully been created in a shared tasks list.
- **createShiftClicked** - When a manager selects **Create a shift**.
- **createShiftOrTimeOffClicked** - Triggered if you select **Create a shift** or **Time off**.
- **createTask** - Used for when create action fails, checks call to Planner service. Confirms a task create operation failed.
- **createTaskList** - When a user navigates to the create plan view from home view.
- **createTeam** - Provides success data around the successful creation or discard action for new team creation, when:

    - The **Done** button is selected on the **Create Team** Page.
    - The **Cancel** button is selected on the **Create Team** Page.
- **createTeam, createChannel** - This provides success data around the successful addition of members in a team and the successful creation of a new team when:
    - The **Skip** button is selected in the **Add Members** page (check existing first).
    - The **Done** button is selected in the **Add Members** page (check existing first).
    - Shows team or channel creation acknowledgement.
- **crossCloudDialogCancel** - **Cancel** is selected for a cross-cloud dialog.
- **crossCloudDialogJoin** - **Join as guest** is selected for a cross-cloud dialog.
- **dashboardNav** - A user navigates to a tile on the chat dashboard.
- **dateChanged** - A user modified a shift date.
- **datePickerLaunch** - Confirms that date picker was successfully launched.
- **dayClicked** - Selecting the day view when user is seeing their shifts.
- **daySaved** - A user saves the day availability, saves a day of shifts.
- **declineTimeOffRequest** - When a user declines the request for time off of work. It's a key functionality for time off, for manager to reject time off request.
- **deleteClicked** - When **Delete** is selected within task details, which brings up the confirmation dialog.
- **deleteContact** - A user deletes an existing private contact.
- **deleteMeeting** - Select the **Delete** button from the Meeting Details page.
- **deletePersonalTask** - Confirms a personal task has been successfully deleted.
- **deletePersonalSubtask** - Confirms a personal sub-task has been successfully deleted.
- **deletePlannerTask** - Confirms that a shared task delete operation completed successfully.
- **deleteShift** - Shift deletion.
- **duration_picker_dismissed** - When the duration picker is dismissed.
- **deleteTask** - Verifies with the Planner service as to whether a delete action was successful or unsuccessful. Confirms that a task delete failed, that is, the deletion of a task was unsuccessful.
- **deleteVoicemail** - Delete voicemail item tapped.
- **demotedToAttendee** - A user demotes a presenter - **Change** button in the dialog box.
- **denyParticipant** - Number of times a user denies someone entry from the roster.
- **descriptionChanged** - Confirms a shared task description has changed successfully.
- **descriptionClicked** - When a user selects **View description** from task details.
- **detailsTabClicked** - The **Details** tab is selected on the meeting.
- **deviceAddressBookSync** - Fired when address book sync is turned on from the settings page.
- **deviceAddressBookUnsync** - Fired when address book sync is turned off from the settings page.
- **dialIn** - A user chooses to Dial in into a meeting (various locations).
- **dialInBadNetworkBanner** - **Dial in** is selected for a poor connection banner.

- **dialInBadNetworkBannerCancel** - The **Dial in** is cancelled on the native dialog.
- **dialInBadNetworkBannerConfirm** - The **Dial in** is confirmed on the native dialog.
- **dialInCall** - **Call** is selected on the **Dial in** pop-up.
- **dialInCancel** - **Cancel** is selected on the **Dial in** pop-up.
- **dialOutCall** - Triggered when a user:
  - Joins in Drive mode.
  - Selects **Call** on the **Call me back** pop-up.
- **dialOutCallAAD** - When any number is selected from **My numbers** in the action sheet
- **dialOutCallRecent** - When any number is selected from previous recent numbers in the action sheet.
- **dialOutCancel** - **Cancel** is selected on the **Call me back** pop-up.
- **dialOutDialog** - **New number** is selected in the action sheet.
- **dialOutFailRetry** - **Retry** is selected from a failure banner.
- **DialPad** - The **DialPad** button is selected from the call list.
- **disableCategory** - Disable a type of notification or disable incoming call notifications.
- **disabled** - **Skip notifications** is selected in the First-run experience (FRE). This provides key success data for skipping the notification in the FRE flow.
- **disableQuietDays** - Quiet Days disabled. Feature success telemetry for quiet days.
- **disableQuietHours** - Quiet Hours disabled.
- **discoverTeams** - Navigate to Browse and Join Teams page.
- **Dismiss_earlycancelledCQF** - The CQF early cancelled call form is dismissed.
- **Dismiss_ratemycallCQF** - The CQF rate my call form is dismissed.
- **Dismiss_ratemyliveeventCQF** - The CQF rate my live event form is dismissed.
- **dismissBadNetworkBanner** - **Dismiss** is selected for a poor connection banner.
- **dismissFlyout** - **Dismiss** button is selected.
- **dismissModality** - The modality picker is exited without sharing.
- **dismissModalityPicker** - The **Modality picker** button is selected.
- **dismissReadReceiptsNotice** - **Got it** is selected from a feature notice.
- **dismissStartRecording** - Dismiss error when starting recording.
- **dismissStopRecording** - Dismiss error when stopping recording.
- **dismissUseWifiForVideoBanner** - Triggered when a user dismisses a banner:
  - That tells the user that remote participant video is blocked, and users have to switch to WiFi to see it.
  - That tells the user that users have to switch to WiFi to share video.
- **DLPDelete** - A user deleted a blocked message.
- **DLPEdit** - A user edited a blocked message.
- **DLPOverride** - A user overrode blocked message.

- **DLPOverrideReport** - A user reported a false positive and overrode the message.
- **DLPReport** - A user reported a false positive.
- **DLPResolve** - A user attempted to resolve a DLP message.
- **DLPSeeOriginal** - A user tapped to see an original message.
- **downloadFile** - Helps to:
  - Determine if a download operation was initiated.
  - Determine if a file was downloaded successfully.
- **dragDatePickerHandle**
- **dtmfPSTNCall** - DTMF button on DialPad is tapped.
- **dueDateChanged** - Triggers when a user assigns a duedate to a task.
- **dueDatePickerClicked** - Triggers when the **Due Date** button is selected in task details, opening the duedate picker page.
- **dueDateSelected** - Triggers when a user applies a filter by duedate while viewing a tasklist.
- **dueDateUnselected** - Triggers when a user unapplies a filter by dueddate while viewing a tasklist.
- **edit** - **Edit** button in a chat message.
- **editChannel** - A user selects a button to edit a channel that they own or administer.
- **editContact** - A user edits an existing private contact, this can be done by navigating to the contact card.
- **editMeetingResponse** - Edit meeting response from the meeting detail page.
- **editNavigation** - **Reorder** is selected in the **More** menu to edit the order of bottom bar apps.
- **editRsvpMeetingOptions** - Select **RSVP** to change from the previous selection.
- **editShiftClicked** - Edit a shift.
- **editTeam** - A user taps on a button to edit a team that they own or administer.
- **editTeam, editChannel** - Relating to the successful addition of members in a team and successful creation of an existing team when:
  - The **Cancel** button is selected in the **Add Members** page (existing team or channel).
  - The **Done** button is selected in the **Add Members** page (existing team or channel).
- **emergencyCall** - Emergency Call placed calling plan.
- **emergencyCallDirectRouting** - Emergency Call placed direct routing.
- **emergencyCallLocationPolicyBased** - DialEmergency using DialPad.
- **emergencycallSecurityDeskNotify** - Emergency Call placed, security desk informed.
- **enableCategory** - Relating to notification settings when enabling:
  - A type of notification.
  - Incoming call notifications.
- **enabled** - Relating to enabling the notification in the First-run experience (FRE) flow:
  - **Enable notifications** is selected in the First-run experience (FRE).
  - Enable is selected in a reminder.

- **enabled/disabled** - Calling permissions or contact permissions (Android only).
- **enabled, notNow** - Notification permission prompt **Accept** button, First-run experience (FRE) Notifications Permission (iOS). This captures how many people have enabled the notification feature and provides information.
- **enablediOSPrompt** - A user actually enables notifications in the iOS notifications permissions prompt. This gives information about users who actually enable notifications in iOS from notifications permissions prompt.
- **enabledQuietDays** - Quiet Days enabled.
- **enableLocationPermission** - When a user enables location permissions for the share location feature.
- **enableQuietDays** - A user enables quiet days.
- **enableQuietHours** - Quiet Hours enabled.
- **endEditing** - **Save** button pressed.
- **endFileShare** - **Go back** is selected on a file sharing dialog.
- **endMyShift** - Number of devices in shared mode or number of times signed out.
- **endPhotoShare** - **x** out from photo share.
- **entryPointClicked** - Selecting **Requests** in the **Schedule** tab. Requests are for when a Firstline Worker (FLW) is requesting a shift time, etc..
- **endPSTNCallSelected** - A user ends a PSTN and a Content call.
- **endPSTNCallShown** - A user is prompted to end a PSTN or a Content call.
- **endVideoShare** - **x** out from Video share.
- **errorShown** - An error is shown.
- **expand/collapse** - Device contacts or company contacts section.
- **expandCollapseSection** - Tap a section header to expand or collapse a section.
- **Expected: atMention - Android: chatSendMessage - iOS: sendMsg** - @mention a bot in a compose box.
- **Expected: botClickCardAction - Android: showCard - iOS: missing** - Tap on card buttons. Cards are key platform constructs and measuring their usage and pattern is necessary to understand platform usage and keep a look out for potential issues on the client side.
- **Expected: chatSendMessage - iOS: composeSendMessage** - Tap on **Reply** and reply to a bot chat in a channel.
- **Expected: composeSendMessage - Android: replyChannel - iOS: missing** - Tap on **Reply** and reply to a bot chat in a channel.
- **Expected: messageLike - Android: reactLike_CM** - Like a bot message.
- **Expected: messageUnread - Android: markAsLastUnread** - Message context menu options for a bot message.
- **federatedUpgradeNewChat** - Legacy chat is upgraded to native.
- **files** - Tracks if the file listing is done successfully in the chat and channel files tab.

- **fileSelected** - A PowerPoint presentation is selected.
- **fileThumbnailPreviewDownloaded** - Helps to identify if a thumbnail was rendered successfully for a file.
- **fileThumbnailPreviewFromCache** - Captures if thumbnail shows from cache successfully and helps to identify if thumbnail was rendered successfully for a file.
- **fileThumbnailPreviewNotAvailable** - Helps to identify if thumbnail was rendered successfully for a file.
- **fillFrameVideo** - Fill frame from action sheet.
- **firstTimeSignedIn** Sign in or sign up event triggered by:
  - Sign-in success.
  - First sign-in succeeded.
  - Sign-in Errors are seen by a user.
  - Record telemetry about MAM/MDM policies implemented on first time login.
  - Record app install referrer parameters after first time successful login.
- **fitToFrameVideo** - Fit to frame from action sheet.
- **flipCamera** - Flip camera.
- **forcedUpdateAccept** - A user accepts to update the app version in the force update dialog.
- **forcedUpdateExit** - A user closes the app instead of updating the app version in the force update dialog.
- **forcedUpdatePrompt** - Used in situations where users on older versions, that may not have the latest security and privacy fixes, need to be reached.
- **formattingBold** - A user selects bold formatting.
- **formattingHighlight** - A user selects highlight formatting.
- **formattingImportant** - A user selects importance.
- **formattingItatlics** - A user selects italics.
- **formattingTextColor** - A user selects text color formatting.
- **formattingUnderline** - A user selects underline.
- **FRE - No AS Assigned** - Record telemetry about MAM/MDM policies on app launch. Telemetry for Intune integration for MAM and MDM. Provides success data about failure during First-run experience (FRE).
- **freActionClicked** - **Get started**, **Try Later**, or **Close** (GPS) is selected in the First-run experience (FRE).
- **freDone** - First-run experience (FRE) has been done.
- **freTriggered** - A user views the time clock on the First-run experience (FRE).
- **funSearchQueryEntered** - Giphy query entered. Success data for the giphy attachment feature in Teams.
- **funSelectItem** - Giphy image chosen. Success data for the giphy attachment feature in Teams.
- **galleryImage** - Image uploaded - gallery.
- **get_directions_clicked** - The **Get directions** button is selected.
- **goToNotificationSettings** - Go to the notification settings page from **we updated notification settings** dialog.
- **GPSPromptClicked** - The **Allow** or **Don't Allow** is selected in an OS prompt. either allowing GPS or not.

- **group_map_closed** - A user opens the map viw from chat.
- **group_map_open** - User closes the map view.
- **groupCallJoin** - A user joins a Group call.
- **groupClicked** - Tracks when a user selects the shift group.
- **guideMe** - Users selects a banner that informs them about a 3P app blocking notifications and offers troubleshooting guidance.
- **hamburgerMenu** - Navigate to the hamburger menu. The hamburger menu contains important actions, such as account switch, notification settings, data setting, and profile settings.
- **handoffComplete** - A meeting or call was handed off on this device.
- **handoffJoin** A meeting hand-off option is selected on the action sheet.
- **hardwareAudioOff** - Turn audio off through the hardware buttons.
- **hardwareAudioOn** - Turn audio on through the hardware buttons.
- **hide** - Hide chat.
- **hideChannel** - Hide a channel from the teams and channel list.
- **image** - Image.
- **immediateCallForward** - Immediate call forward target is set, or enabling immediate call forwarding (Calls ring me is disabled).
- **importanceToggleClicked** - Triggers when the **!** field is toggled inside task item details.
- **importantMessage_select** - A user selects an important message from the priority context menu.
- **importantMessageSend** - A user sends an important message.
- **inCallDialOut** - A user selects the **Call me back** button from in-call more options.
- **initiatePhotoShare** - Initiate photo share.
- **initiateVideoShare** - Initiate video share.
- **install** - Install or Install Event.
- **installReferrer** - Record app install referrer parameters after first time install.
- **invisionWhiteboardClicked** - Invision whiteboard is selected:
  - The **Channel Files** tab.
  - The meeting **Chat Files** tab.
- **inviteFreemium** - Tapping the **+** button in the Invite screen.
- **inviteGuest** - Tapping the **+** button in the Invite screen.
- **joinFromDeeplinkInTeams** - A user joined through a deeplink from within the Teams app.
- **joinFromDeeplinkOutsideTeams** - A user joined through a deeplink from outside the Teams app.
- **joinFromJoinLauncher** - A user joined from a Join Launcher.
- **joinFromNudge** - A user joined from nudge.
- **joinFromStore** - A user joined after downloading the app from the app store.

- **joinMeeting** - detects the success or failure of joining meetings from calendar in the following circumstances:
  - Join the meeting through Dial in.
  - Join the meeting through Call me back.
  - Join the meeting content only.
  - Select the **Meeting join** button from agenda view.
- **joinOptionsEdu** - An EDU user selects options to join a scheduled meeting and is shown the proper options.
- **joinTeam** - The **Join** button is pressed.
- **joinViaCode** - A user joins a meeting via a code.
- **labelPickerClicked** - Confirms that the label picker successfully launched.
- **labelSelected** - Confirms that a label has been successfully selected.
- **labelUnselected** - Confirms that a label has been successfully unselected.
- **launchLinksGallery** - When a user enters the links gallery from the dashboard.
- **Launch source such as direct, link, appShortcut** - Launches directly or via link (recording Mobile Application Management (MAM) or Mobile Device Management (MDM) telemetry on app launch to collect data for active users).
- **leaveChat** - Confirm leaving chat.
- **legacyChatLink** - A link is selected to a legacy chat.
- **likeAppDismiss** - When the prompt that asks whether a user likes the app or not is dismissed without a response.
- **likeAppNo** - When the prompt that asks whether user likes the app receives a response of no.
- **likeAppYes** - When the prompt that asks whether user likes the app receives a response of yes.
- **likeMsg** - Select **Like**.
- **linkPreviewCancel** - Understand the preview closure behavior.
- **listUserClicked** - When a user selects a user in Working Now.
- **liveCaptions** - Live captions are turned on or off.
- **liveEventAdditonalLink** - An additional link is selected.
- **liveEventInfo** - The **Info** button is selected.
- **liveEventJoin** - A user joins a live event.
- **liveEventLeave** - The **Leave** button is pressed.
- **liveEventPresenterJoin** - A live event is joined by a presenter.
- **liveEventPresenterJoinAsAttendee** - A live event presenter joined as an attendee.
- **liveEventQnA** - The **Q&A** icon is selected.
- **liveEventYammer** - The **Yammer** icon is selected.
- **liveMeetingPushNotificationClicked** - Push notification is selected.

- **liveMeetingToastClicked** - In-app toast is selected.
- **live_location_in_chats_from_profile_clicked** - **Live locations** is selected in profile view.
- **lobbyPickAudio** - Number of times a user switches audio output from lobby.
- **lobbyToggleMuted** - Number of times a user turned the mic on or off from lobby.
- **lobbyToggleVideo** - Number of times a user turned video on or off from lobby.
- **logOutClicked** - When a user logs out.
- **location_active_tracking** - A user's device is switched to active tracking.
- **locationCard** - Select a location card.
- **location_family_sync** - Showing members of a Family group that were created in MSA family app. Confirms that all family members that can be granted consent are displayed.
- **location_group_map_sync** - Map view is opened.
- **location_map_load** - Map view load.
- **location_map_markers_load** - Map view load. Confirms that location markers for all users actively sharing are displayed properly on the map view.
- **location_message_send** - A user initiates a location sharing session.
- **location_data_use_privacy_denied** - A user dismisses or selects **Not now** on a popup explaining use of location data by TFL.
- **location_data_use_privacy_granted** - A user selects **Allow** on the a popup explaining the use of location data by TFL.
- **location_settings_open** - A user opens location settings.
- **location_sharing_start** - A user shares their live location in a chat.
- **location_sharing_stop** - A user stops sharing their live location in a chat.
- **loginFailed** - User was unable to login.
- **loginSuccess** - User was able to login.
- **manageBlockedNumbers** - Access blocked numbers through Settings.
- **mapAppPicker** - When a user selects which mapping app to use when they tap on a location card.
- **markAsRead** - Mark as read.
- **markAsUnread** - Mark as unread.
- **markChannelRead** - A user marks a channel read.
- **messageBookmarkMessage** - Connector card save. Uses existing telemetry with app specific data. Or save a bot message.
- **markAsLastUnread** - Connector card context menu.
- **maskCallerId** - A user enables or disables calling setting to mask caller id.
- **meetingDetailCalendarList** - Meeting Details page selected from calendarList, or select the **Details** tab on the Meeting Details page.
- **meetingDetailChatWithParticipants** - Chat with participants from the Meeting detail page.

- **meetingDetailDeleteMeetingforSelf** - Delete a Meeting from Meeting Detail page for oneself.
- **meetingDetailJoin** - The **Meeting Join** button is selected from Meeting Detail page.
- **meetingDetailParticipants** - See all participants from the Meeting Detail page.
- **meetingDetailScheduledMeeting** - Meeting details page selected from scheduled meeting object (...), or select the **Details** tab of a scheduled meeting.
- **meetingDetailSearchParticipants** - Selected **Search** in meeting participants on the meeting schedule.
- **meetingJoinLeave** - Leave tapped -> **x** is tapped after the **Join** button is tapped.
- **meetingJoinNow** - **Join now for VOIP** selected.
- **meetingJoinNowWithCallMe** - A user joins a meeting with **Call me**.
- **meetingJoinNowWithPSTN** - A user joins a meeting with Dial in.
- **meetingLeaveChat** - Leave chat.
- **meetingMuteChat** - Mute chat.
- **meetingNotesCreatedInChatLink** - The **Meeting notes created** chicklet is selected in private meeting chat or in channel meeting chat.
- **meetingNotesMentionCharLink** - The @mention link is selected in private meeting chat.
- **meetingNotesMentionChatLink** - The @mention link is selected in channel meeting chat.
- **meetingNotesTabEntryPoint** - The **Meeting Notes** tab is selected in private meeting or in a channel.
- **meetingNotificationSettingsAccepted** - Notification settings option was changed to Accepted only.
- **meetingNotificationSettingsAll** - Notification settings option was changed to All.
- **meetingNotificationSettingsNone** - Notification settings option was changed to None.
- **messagePriority_select** - A Message priority entry point is selected.
- **messageSeeOriginal** - A user reverts translated message back to original.
- **meetingSeeParticipantsChatDetails** - See all participants.
- **memberListLoadMore** - Scroll down to load more.
- **messagedEditMessage** - A user edits a message.
- **messageShareMessage** - Share a message.
- **messageTranslate** - A user translates a message.
- **messageUnabletoEdit** - A user is unable to edit a message.
- **meetingUserAnonB2B** - Anonymous B2B joined the meeting.
- **meetingUserAnonB2C** - Anonymous B2C joined the meeting.
- **meetingUserDialIn** - PSTN (Dial in) user joined the meeting.
- **meetingUserDialOut** - PSTN Call me back user joined the meeting.
- **meetingUserFederated** - A federated user joined the meeting.
- **meetingUserFreemium** - A freemium user joined the meeting.

- **meetingUserGuest** - A guest user joined the meeting.
- **meetingUserTenant** - An in-tenant user joined the meeting.
- **messageCopyMessage** - Copy Message.
- **messageDelete** - Message delete.
- **messageEditMessage** - Edit message.
- **messageForwardMessage** - A user selects a Forward entry point from message context menu.
- **messageLike/messageUnlike** - Message like or unlike.
- **messageMuteSender** - Mute or unmute sender.
- **messageLike** - Connector card like. Uses existing telemetry with app specific data.
- **messageScheduledMeeting** - Meeting object in channel selected (Not only scheduled ones).
- **messageTriggered** - This is when a notification is triggered for a message.
- **micPermissionCancel** - **Cancel** is selected on the mic permission dialog.
- **micPermissionGoToSettings** - A user navigates to settings from the mic permissions dialog.
- **MicrosoftWhiteboardClicked** - Microsoft whiteboard is selected on the **Channel Files** tab or the **Meeting Chat Files** tab.
- **moreOptionsClicked** - Triggers when **...** menu on the top-right is selected on the task item editor screen.
- **moveTaskClicked** - Option inside task item more options list.
- **multiCallEndFromUFD** - Number of times a user ends the call on hold in a multi-call scenario.
- **multiCallResumeFromUFD** - Number of times a user selects to resume a call from hold.
- **multiCallSwitch** - Number of times a user selects an option to switch the call and list of calls on hold shows up.
- **multipleAccounts** - Number of accounts for a user.
- **multipleTenants** - Number of tenants per account.
- **mute** - Mute chat.
- **muteOnWhiteboard** - A user mutes or unmutes on the whiteboard screen.
- **muteParticipant** - Mute participant (move to the action sheet).
- **my_location_button_clicked** - User centers the map on their location by selecting the **My location** button.
- **my_location_clicked** - A user centers the map on their location by selecting the **blue dot** on the map.
- **myShiftPickerClicked** - Only logged if the request being sent is a swap or offer. **My Shift** picker is selected.
- **nameGroupChat** - Name group chat.
- **nativeTimeClockBreak** - A break on the time clock.
- **nativeChatLink** - A link to native chat is selected.
- **navActivity**- Navigate to the activity feeds page.

- **navBookmark** - A user navigates to the **Saved** tab or app on the bottom bar or app tray.
- **navCalendar** - Measures if a user navigates to a calendar.
- **navCallingSettings** - A user navigates to the calling settings.
- **navCalls** - **Calls** tab tapped.
- **navCamera** - A user navigates to the **Camera** tab or app on the bottom bar or app tray.
- **navChat** - A user navigates to the **Chat** tab or app on the bottom bar or app tray.
- **navContacts** - A user navigates to the **Contacts** or **People** tab or app on the bottom bar or app tray.
- **navDashboardTab** - A user navigates to the **Dashboard** tab within a conversation.
- **navDynamics365** - Triggered when the Dynamics365 app is opened.
- **navFiles** - Files app is selected, tracks if a user can launch the files app in the app tray (iOS).
- **navFilesTab** - Files app is selected, tracks if a user can launch the files app in the bottom nav bar (iOS).
- **navMeetings** - **Calendar** tab tapped.
- **navNotes** - Triggered when the Notes app is opened.
- **navOrganization** - Triggered when the Organization app is opened.
- **navOrgChart** - Triggered when the Orgchart app is opened.
- **navPeople** - Event is triggered when the People app is opened.
- **navPeopleSettings** - Triggered when you navigate to the **People** category in the Settings menu.
- **navPersonalFiles** - Files app is selected, tracks if a user can launch the files app in the bottom nav bar (Android).
- **navPhotoTab** - **Photo** tab.
- **navSaved** - A user navigates to the **Saved** tab or app on the bottom bar or app tray.
- **navSelectPlan** - When a user selects a shared plan to navigate to from home view.
- **navSelectPersonalList** - When a user selects a personal plan to navigate to from home view.
- **navSelectSmartList** - When a user selects a smart plan to navigate to from home view.
- **navTasks** - Triggered when the Tasks app is opened.
- **navTeams** - Tap **See all**.
- **navVideocamera** - A user navigates to the **Camera** tab or app on the bottom bar or app tray.
- **navVideoTab** - **Video** tab.
- **navVoicemail** - A user navigates to the voicemail page.
- **navWalkieTalkie** A user has opened the walkie talkie app.
- **navWiki** - Triggered when the Wiki app is opened.
- **newChat** - A user creates a chat.
- **newCall** - Taps **New call** button.
- **newCallDialPad** - Taps the **Dialpad** button on tab.

- **newCallPeople** - Taps the **People** button on tab.
- **noBGActivityDetected** - Exceeds the threshold for background activity failures.
- **notBlockedDevice** - A user doesn't reach the threshold for background activity failures in 30 days.
- **notNow** - **Not now** is selected in reminder.
- **notNowUpdate** - UpdateDefer.
- **notificationNavChannelConversation** - Launch the app using a notification for a channel conversation.
- **notificationNavChannelThreadConversation** - Launch the app using a notification for a specific message in a channel conversation.
- **notificationSettingTurnedOff** - Turn off push notifications for the Teams Android app.
- **notificationNavPreCall** - A user gets a notification of a meeting starts that navigates them to the precall screen on selection.
- **ocvFeedback** - Relating to the performance of the OCV feedback form.
- **ocvFormCancelled** - An event sent when the OCV feedback form is cancelled and the user returns to the app.
- **ocvFormOpened** - An event sent when the OCV form is opened.
- **ocvFormSubmit** - An event sent when the user clicks submit on the OCV feedback form.
- **offerRecipientClicked** - Only logged if the request being sent is an offer. The user enters the team member picker to offer a shift. Offering means offering a shift time off.
- **offerSwapShiftFromL1** - The type of shift a user tries to offer or swap from a shifts list. iOS action is a **SwipedRight** and Android action is **LongPressed**.
- **offerSwapShiftFromL1Triggered** - A user offers to swap a shift with another user.
- **officeLens** - Fires when the app launches the officeLens camera feature, either when:
  - A user tries to attach a photo to their message
  - A user tries to take a photo and upload directly to the gallery.
- **officeLens or cameraImage** - Camera picture selected - standard camera or office lens.
- **onBackClicked** - Whenever the back arrow is selected to navigate back a page.
- **oneNote** - When a user opens the OneNote app.
- **open** - Notification Settings tap.
- **open edit** - Wiki usage telemetry - User selects to edit the wiki.
- **openApp** - Opening a personal app.
- **openAppDrawer** - **More** is selected at the bottom bar to open the app drawer.
- **openEditMeetingForm** - The **Edit** button is selected from the Meeting Details page.
- **openFile** - Helps:
  - To identify a file was able to be opened in the chat successfully.
  - To identify a file was able to be opened from a files listing.
  - To check if files can be opened from a OneDrive list.
  - To identify open files can be opened from a channel list.

    - Determining if files can be opened from group chats.
    - Determining if a file can be successfully opened from files app.
    - Determining if a message file can be opened from the chicklet successfully.
    - Determining if files from recent list can be opened successfully.
    - Determining if a file from file list can be opened successfully.
    - Determining if a file can be opened from a messages file chicklet.
    - Determining if files can be opened successfully from a file list.
- **openInAppClicked** - Option inside task item more options list, only available for personal tasks.
- **opensCalendarView** - Tapping on **Open shifts** from the **Schedule** tab.
- **openContactCard** - A user taps on a **Contact** icon or a contact in the people app to launch the profile card of that contact.
- **openContactCard_ReactionSummary** - Navigate to contact card from the reaction summary page.
- **openFileInApp** - Helps to identify if user opted to open files outside of Teams versus inside of Teams.
- **openHamburgerMenu** - The **Hamburger** icon (top-left) is selected to open the side menu for access to settings, presence, and tenant switcher.
- **openInStream** - Open a video in Stream.
- **openMeetingDetails** - Open the meeting details or the Open Meeting details page of a particular meeting.
- **openModalityPicker** - X = ChatsAndChannels for chats and channels.
- **openNewMeetingForm** - Confirms a personal sub-task has been successfully updated.
- **openNewMeetingForm** - Open the scheduler while setting up a new meeting.
- **openPhotoLibrary** - Select a photo library.
- **openQuietDays** - Navigate to Quiet Days page.
- **openQuietHours** - Navigate to Quiet Hours Page.
- **openReactionHoverBubble** - Press the **Add reaction** button on the reaction summary page.
- **openReactionSummary** - Invoke reaction summary drawer.
- **openSettingsSetUpInstructions** - Open **Settings** from instructions.
- **openSharedLink** - When a user opens a link from the dashboard links tile or the links gallery.
- **openShiftsClicked** - How many people tap the **Calendar** icon.
- **orgChart - No AS assigned** - Basic usage telemetry for org chart.
- **pageEntered** - A user entered a page.
- **parental_consent_grant** - A user grants permission for a minor in their MSFamily to use the Live Location feature in TFL.
- **parental_consent_remove** - A user revokes permission for a minor in their MSFamily to use the Live Location feature in TFL.
- **pauseVoicemail** - **Pause** tapped on a voicemail item.
- **peoplePickerInvoked** - People Picker is used across seven places in Teams mobile, including (but not limited to):

    - New chat picker.
    - Forward a message.
    - add participant to a meeting.
- **personalAppNavBotChat** - Navigate to the bot within personal app.
- **personalAppNavTab** - Navigate to tabs within personal app.
- **photoLibraryPicker** - **Open photo library** tapped inside image picker.
- **pickGalleryPhoto** - Pick a photo from the gallery.
- **pickParticipantChatDetails** - Pick a user from the list.
- **pickRecentPhoto** - Chooses a recent image to share.
- **pinChannel** - Pin a channel to show it above the teams and channels list.
- **pinSelf** - Pin myself from the action sheet.
- **pinUser** - Pin a user from the action sheet.
- **play** - Play the recording.
- **playVoicemail** - **Play** tapped on voicemail item.
- **plusButtonClicked** - Selecting the **plus button** (**+**).
- **pptNextSlide** - Next slide as a presenter or in private viewing.
- **pptPreviousSlide** - Previous slide as a presenter or in private viewing.
- **pptReturnToPresenter** - Go to the **Live** slide (the one that the presenter and everyone else is on).
- **pptStopPresenting** - Stop presenting.
- **pptTakeControl** - Take control.
- **preJoinAddRoom** - The **Add a room** button is selected in pre-join dropdown, **Join** is selected in the **Add a room** scenario.
- **preJoinAudioOff** - The **Audio off** button is selected in pre-join dropdown.
- **preJoinAutoAddRoom** - **Join now** is selected when a room is nearby.
- **preJoinBack** - **Back** or **Close** button selected.
- **preJoinDenied** - A user is unable to join a meeting.
- **preJoinDeviceAudio** - **Join with device audio** is selected from dropdown.
- **preJoinDialIn** - The **Dial in** button is selected in the pre-join dropdown.
- **preJoinDialInCall** - A user confirms the **DIal in** request on prejoin.
- **preJoinDialInCancel** - A user cancels the **Dial in** request on prejoin.
- **preJoinDialOut** - The **Call me back** button is selected the in pre-join dropdown.
- **preJoinDialOutCall** - A user confirms the **Call me back** request on prejoin.
- **preJoinDialOutCancel** - A user cancels the **Call me back** request on prejoin.
- **preJoinPSTNOptions** - A user selects a dropdown for other join options.
- **priorityChange** - Triggers when priority filter is applied while viewing a tasklist.

- **priorityPickerClicked** - Triggers when a user navigates to a priority filter picker from the task list filter screen.
- **privateMeetingJoin** - **Meeting Join** button tapped from Private meeting chat.
- **processInBG** - Process incoming notification in the background (Android).
- **processInFG** - Process incoming notification in the foreground (Android).
- **progressItemClicked** - Confirms a user has successfully opened the progress picker for a task.
- **promotedToPresenter** - User promotes an attendee - **Change** button in the dialog box.
- **provideFeedbackDismiss** - Dismiss the prompt that asks whether the user would like to send feedback about why they didn't like the app.
- **provideFeedbackNo** - Respond no to prompt that asks whether the user would like to send feedback about why they didn't like the app.
- **provideFeedbackYes** - Respond yes to prompt that asks whether the user would like to send feedback about why they didn't like the app.
- **provideRatingDismiss** - Dismiss the prompt that asks whether the user would like to rate us on the app store after saying they liked the app.
- **provideRatingNo** - Respond no to the prompt that asks whether the user would like to rate us on app store after saying they liked the app.
- **provideRatingYes** - Respond yes to the prompt that asks whether the user would like to rate us on app store after saying they liked the app.
- **proximityPermissionDismissed** - Permission banner is dismissed.
- **proximityPermissionGranted** - Permission is given on the pop-up.
- **proximityPermissionViewed** - Permission banner is tapped.
- **pushNotification** - Triggering events are:
    - Launch via notification.
    - Push notification selected.
    - Reconnecting push notification is tapped.
    - **Reconnect failed** push notification is tapped.
- **quickNotificationAction** - When a user interacts with one of the quick action responses on a notification (such as the ability to like a message directly from the push notification).
- **quickSelectImagePicker** - Quick select.
- **quickStartLiveEventJoin** - Quick start live event is joined by a user.
- **quietHoursValues** - Capture Quiet Hours State on back button navigation.
- **quotedReplySent** - A user sent a reply message with context type.
- **reactAngry_CM** - React with angry from the context menu.
- **reactAngry_HB** - React with angry from the hover bubble.
- **reactHeart_CM** - React with heart from the context menu.
- **reactHeart_HB** - React with heart from the hover bubble.

- **reactLaugh_CM** - React with laugh from the context menu.
- **reactLaugh_HB** - React with laugh from the hover bubble.
- **reactLike_CM** - React with like from context menu or like a bot message.
- **reactLike_doubleTap** - React with like from the double tap.
- **reactLike_HB** - React with like from the hover bubble.
- **reactSad_CM** - React with sad from the context menu.
- **reactSad_HB** - React with sad from the hover bubble.
- **reactSurprised_CM** - React with surprise from the context menu.
- **reactSurprised_HB** - React with surprise from the hover bubble.
- **reactRemoved_HB** - When a user removes a reaction through the reaction summary page experience.
- **readReceipts** - User enabled feature.
- **redeemInvite** - In app redemption.
- **refreshCalendarList** - Pull down to refresh agenda view.
- **refreshLinksGallery** - When a user swipes down to refresh the links gallery.
- **removeAssignee** - Confirms that an assignee is removed from the assignment picker view (as opposed to *assignmentRemoved* which triggers when selecting **x** outside of assignment picker view).
- **removeMeeting** - Select **Remove from Calendar** from the Meeting Details page of a cancelled meeting.
- **removeParticipantFromEditMeeting** - Remove a participant after selecting **Edit meeting** from the Meeting Details page.
- **removeParticipantFromNewMeeting** - Remove a participant from the scheduler page while setting up a new meeting.
- **removeReplyObject** - A user removed reply object from compose.
- **removeUser** - Confirms that an assignee is removed from within the assignment picker view (as opposed to *assignmentRemoved* which triggers when selecting **x** outside of assignment picker view).
- **removeUser_CM** - When a user removes someone via the chat participant list.
- **removeUserConfirm** - A user confirmed a remove user dialog.
- **removeUserContextMenu** - A user removed a participant via context menu.
- **removeUserSwipe** - A user removed a participant via swipe.
- **reorderChannelItem** - A user reorders pinned channels.
- **reportAbuseConfirmation** - When a user selects the **Done** button on the confirmation screen.
- **reportAbuseOpen** The number of times the **Report a concern** button is selected in the context menu.
- **reportAbuseSend** - When a users selects the **Report** button, the telemetry should store the type of report selected.
- **replyChain** - Selected **New message** button or textbox in reply chain (thread).
- **replyChannel** - Selected **Reply** button in channels.

- **replyNavigation** - Reply object was selected to navigate to referenced post.
- **replySendMessage** - Send channel reply.
- **replyViaMsgOptions** - User started reply via context menu.
- **replyViaSwipe** - User started reply via swipe.
- **requestActedOn** - Triggered when a manager acts on open shift requests.
- **requestActionClicked** - When a user requests an action, such as when the request for a shift is selected (either a Firstline Worker (FLW) manager viewing or a Firstline Worker.
- **requestDetailsClicked** - When the request for a shift is selected (either a Firstline Worker (FLW) manager viewing or Firstline Worker).
- **requestJoinTeam** - **Request** button pressed.
- **requestSent** - Logs if there was a request sent.
- **requestToJoinTeam** - Request to join team (public or private).
- **requestToJoinTeamError** - Error with join request.
- **requestTypeClicked** - Determining the type of request people select from the requests picker.
- **resolveIssue** - **Resolve** is selected in the notification troubleshooter flyout to navigate to the blocker app.
- **responseClicked** - A user selects a response page.
- **retryButtonClicked** - The **Retry** button is selected.
- **returnToMessage** - The **Return** button is selected to navigate back to the message.
- **runningLate** - The user is running late.
- **safeLink** - Link verified as safe.
- **saveEditMeeting** - Select the **Save** button while on the meeting scheduler page after updating a meeting.
- **saveNewMeeting** - Select the **Save** button while on the meeting scheduler page. To log successfully saved meetings and the percentage of meetings that failed to create due to a client side or service error.
- **savePlanClicked** - Triggers **Create** is selected in the new plan creator from the default opening of the app.
- **scheduledMeetingJoin** - The **Meeting Join** button is selected from the scheduled meeting object.
- **scrollCalendarList** - Measures scrolls in calendar.
- **scrollDatePicker** - Scroll through the calendar date picker control.
- **searchAbandoned** - Determines if search was abandoned.
- **searchCancelled** - Determine if:
  - Search was successful or if the user abandoned search.
  - A search query was successful.
- **searchContacts** - Search from the Call List.
- **searchIcon** - Determine:
  - If search can be triggered.
  - The source of a search trigger.
  - If relevant results are found successfully.

- **searchInitiated** - Determines if search can be triggered, and the source of search trigger.
- **searchMeetingParticipants** - Search for participants to add within the scheduler form. To distinguish between the number of appointments created versus the number of meetings created.
- **searchResultsClicked** - Determines:
  - If relevant results can be found successfully.
  - If search results were from the All tab versus an individual domain.
- **searchTab** - Determines:
  - Domain information of the search result - for people, chat, messages, and files.
  - If search results was from ALL tab vs individual domain.
- **searchTabClicked** - Determines:
  - Domain information of the search result - for people, chat, messages, and files.
  - If the relevant results are found successfully.
- **seeAllMeetingParticipants** - Select **See All** from the meeting details page, or view all participants. Logs user data across the calendar funnel, where calendar meeting details play an important role, this helps validate selections for Dial ins, Teams meetings, RSVPs, etc..
- **seeMeetingDescription** - Opening the Meeting Details page or selecting **See More** on the Meeting description from the Meeting Details page. Data is logged across the calendar funnel, where calendar meeting details play an important role, this helps validate selections for Dial ins, Teams meetings, RSVPs, etc..
- **seeRsvpMeetingOptions** - Select **Notify Organizer** from the RSVP pop up, or select **Rsvp** options from the Meeting Details page.
- **selectActivityType** - Captures select gestures on feed item.
- **selectCalendarDate** - Select a specific date on the calendar date picker control.
- **selectDevice** - Selecting a particular device in the displays app.
- **selectGeneralSetting** - Go to general settings.
- **selection** - Device contact selected, or company contact selected.
- **selectMeetingChicklet** | Meeting.
- **selectMeetingRsvpOption** - Select the **RSVP** button to choose an option.
- **selectMeetingRsvpOptions** - Select the **RSVP** button to choose an option.
- **selectPersonalList** - Confirms that the user successfully navigated to a personal task list by tapping it.
- **selectPlannerList** - Confirms that the user successfully navigated to a shared task list by tapping it.
- **selectSettingOption** - Go to the **Settings** tab from the hamburger menu.
- **selectTheme** - Enable dark theme.
- **selectUser** - Confirms that an assignee was successfully selected for a task.
- **selfLongPress** - Long press on myself.
- **Send_earlycancelledCQF** - A user submits feedback on CQF early cancelled call form.
- **send_map_pin_clicked** - A user sends a static location.
- **Send_ratemycallCQF** - A user submits feedback on CQF rate my call form.

- **Send_ratemyliveeventCQF** - A user submits feedback on CQF rate my live event form.
- **sendForward** - A user confirms to send a forward message from the forward picker.
- **sendImage** - Send image.
- **sendLocation** - Send location.
- **sendMsg** - Select **Send** in reply.
- **sendRequestBulkClicked** - This is logged once for each bulk request send.
- **sendRequestClicked** - **Shift request sent** is selected.
- **sendVoiceMessage** - **Record** button is released.
- **Setting/Dismiss** - Device contacts setting.
- **settingsNavReadReceiptNotice** - User went to settings from the feature notice.
- **settingsOpened** - This is triggered when the user's device time zone doesn't match the team time zone, and the user goes to Settings.
- **shareFile** - Triggered when **Share file** is selected. Also helps to check if:
  - The user was able to initiate share file operation.
  - The user can share a file successfully.
- **shareHistory** - Share history picker selected.
- **shareInto** -- A user shares something from another app into Teams.
- **sharePlanToChat** - A shared list is manually shared from the tasks app to the group chat as a chicklet, check chicklet sent via the backend messaging service.
- **sharePPTFromChannels** - **Teams and Channels** is selected.
- **sharePPTFromOneDrive** - **OneDrive** is selected.
- **shareRecording** - Share a recording.
- **shareScreen** - Start or stop a screen share.
- **shareShift** - The information that is given when a shift is shared.
- **shareShiftsClicked** - The details of an open shift.
- **shareTray** - **Share...** is selected in the action sheet.
- **shiftAssigneeClicked** - The Shifts Calendar view showing the particular shifts details.
- **shiftDetails** - This allows you to see the details of a shift.
- **shiftDetailsCalendar** - User goes to shift details.
- **shiftDetailsMyShifts** - Tapping on **Calendar** from the **Schedules** tab.
- **shiftDetailsTodaysCoworkers** - On the clock in screen, the **Start** or **End break** button is selected.
- **shortCircuitContactCount** - The number of address book matched short circuited contacts received from a contacts fetch.
- **showBanner** - Number of times the **WiFi Connected, No Internet** banner appears.
- **showCard** - Tap on card buttons. Cards are key platform constructs and measuring their usage and pattern

is necessary to understand platform usage and keep a look out for potential issues on the client side.

- **shownReadReceiptNotice** - The user shown feature notice with settings options.
- **signIn** - **Sign in** is selected on welcome page, or the **Sign In** button is tapped.
- **signUp** - **Create a free account** or **Sign up for free** is selected.
- **simultaneousCallForward** - Triggered when:
  - Simultaneous call forward target is set.
  - Simultaneous call forwarding is enabled (Calls ring me is enabled & Also ring is set).
- **skipVerificationForLink** - Thw user chose to skip verification.
- **SMSSendMessage** - The user sends a SMS message.
- **sortChanged** - Triggers when user changes sort order while viewing a tasklist.
- **startEditing** - **Edit** button selected.
- **startPresentPhoto** - Start presenting photo.
- **startPresentVideo** - Start presenting video.
- **startPSTNCall** - Triggered due to:
  - PSTN Result in Global Search (People).
  - PSTN call placed from Device contactCard.
  - PSTN Call placed from callList.
  - DialPSTN Number using DialPad.
- **startRecording** - Start recording.
- **startVoicemailCall** - **Change voicemail greeting** selected.
- **static_place_selected** - A user drags map to select a static place.
- **statusCheckBoxClicked** - Triggers when task item is either completed or uncompleted.
- **statusMsgCancel** - A user cancels change to status message.
- **statusMsgExpiry** - A user sets the expiry time.
- **statusMsgSet** - A user sets a new status message.
- **statusPageViaContactCard** - A user enters the status compose experience via a contact card.
- **statusPageViaHamburger** - A user enters the status compose experience via the hamburger.
- **stop_location_sharing_logout** - A user logs out of the app.
- **stopMeetingButton** - The number of times a user leaves the lobby without being admitted into the meeting.
- **stopPresentPhoto** - Stop presenting photo.
- **stopPresentVideo** - Stop presenting video.
- **stopRecording** - Stop recording.
- **structuredMeetingsBannerDismiss** - a user dismisses the banner that informs them about their meeting role.
- **stuckOnConnectingDialInSelected** - **Dial in** is selected on the drawer.

- **stuckOnConnectingRetrySelected** - **Retry** is selected on the drawer.
- **stuckOnConnectingShownDismissed** - A user dismissed the drawer.
- **suggested_place_selected** - A user shares a static location by selecting a suggested place.
- **switchTeamAction** - A user switches teams within the time clock. This should fire after the user selects which team they want to switch to.
- **switchTeamsDialogTriggered** - A user views the **Shifts** tab.
- **tabActionCopyLink** - How users discover and use the tab copy link on mobile.
- **tabActionMoreOptions** - Understand ellipsis (...) usage from within a tab.
- **tabActionOpenInBrowser** - Open in browser usage. This is necessary to understand if users prefer opening a tab outside Teams.
- **tabActionOpenInBrowserFromTab** - Understand open in browser usage from within a Tab for more option - discoverability and usage.
- **tabActionOpenInTeams** - Open in usage. This is key in understanding if the tab can be by default set to open in Teams.
- **tabActionRemove** - Understand how discoverable the delete option is and the usage of the feature.
- **tabActionRename** - Understand how discoverable rename is and the usage of the feature.
- **tabActionSetting, Android - fix** - How users discover and use tab config on mobile.
- **table** - Select a table.
- **tabListMoreOptions** - Understand the usage of the more options for a tab.
- **tabOpen** - Notes success in opening tabs, or if there are issues in the way tabs open.
- **tabViewed** - Only logged if the request being sent is a swap, for entries into the **Team Shift** picker.
- **takePhoto** - Take a photo.
- **takePhotoPicker** - **Take photo** selected inside the image picker.
- **tapChicletExpand** - How users preview cards on mobile.
- **tapDatePickerHandle** - Expand the calendar date picker control.
- **tapSettings** - The number of users re-configuring apps on mobile.
- **tasksAppLaunchAdaptiveCard** - The Tasks app is opened from an adaptivecard in a group chat, check the app launch via the URL of the IC3 service.
- **tasksAppLaunchComposeExtension** - The Tasks app is opened from the compose extension in a group chat, check the app launch via the MT service.
- **tasksAppLaunchDashboard** - The Tasks app is opened from the dashboard tile or specific plan, check the app launch via the MT service.
- **tasksAppLaunchDashboardSeeAll** - The Tasks app is opened from the dashboard **See all** button on the dashboard, check the app launch via the MT service.
- **tasksAppLaunchDefault** - The Tasks app is opened from the bottom drawer, check the app launch via the MT service.
- **tabCalendarClicked** - A user has chosen a team from the team picker.

- **teamChannelChanged** - Triggered when a user selects and navigates to a plan from plan list. Only sent to appInsights, not Aria.
- **teamCreate** - A user selects the option to create a new team.
- **teamEdit** - A user edits some aspect of a team that they own or administer.
- **teamNav** - View menu options for a team.
- **teamsDeviceCallResumed** - A user with a bluetooth connected peripheral (mobile phone dock) reactivates a call from hold.
- **teamSelectedClicked** - When a user selects **Team selected** for a timesheet.
- **teamShiftPickerClicked** - When a user adds a new break entry. The event is logged once the user saves the changes.
- **tenantSwitch** - On Switch Tenant. Feature success metrics for MTMA (multiple tenant and multiple account) feature, this helps identify and fix issues proactively and provide a smooth switching experience.
- **tenantSwitchUnsupportedError** - Tenant Unsupported Error (when a user sees the error). Feature success metrics for MTMA (multiple tenant and multiple account), provides telemetry around account or tenant switch errors, so we can identify and fix issues proactively and provide a smooth switching experience.
- **timeClockClicked** - A user selects the **Time clock** button on the My Shifts tab.
- **timeOffReasonClicked** - Determining if a reason for time off is cited.
- **timesheetAddClicked** - When a user adds a note to their break edits. The event is logged once the user saves the changes. **timesheetBreakAdded** - Adding a new clock entry. The event is logged once the changes are saved.
- **timesheetBreakEdited** - When a user confirms their timesheet. The event is logged when the user hits confirm in the modal.
- **timesheetBreakNoteAdded** - When a user deletes their timesheet. The event is logged when the user confirms the delete in the modal.
- **timesheetClockAdded** - When a user selects Edit for a timesheet.
- **timesheetClockEdited** When a user slects Save on an edited timesheet.
- **timesheetConfirmed** - When a user adds a note to their timesheet edits. The event is logged once the user saves the changes.
- **timesheetDeleted** - If a user does or does not have a shift reminder set, and the amount of minutes before a shift a user wants to be alerted.
- **timesheetEditClicked** - User Configuration telemetry.
- **timesheetEditSaved** - A user taps on a time sheet from a user's profile to open that user's time sheet.
- **timesheetNoteAdded** - To view an approved time off request.
- **titleChanged** - Triggers when a task item title changes, triggers on every character change.
- **toast** - In-app toast is selected.
- **toggleChannelsInChat** - Turn feature on or off. Feature success metrics for unified chats and channel experience.

- **toggleClicked** - A toggle is selected.
- **transferNow** - Triggered when:
  - A user selects **Transfer** > **Transfer now**.
  - Transfer target is set to a Person.
  - Transfer target is set to a Phone Number.
- **translateFailed** - Translation failed (excluding offline). Feature success metrics for message translation feature.
- **unansweredCallForward** - An unanswered call forward target is set. Also enables unanswered call forwarding (Calls ring me is enabled and If unanswered is enabled).
- **unblockCaller** - Unblock:
  - Contact or number from the action sheet.
  - Contact or number from a contact card.
  - Number from settings.
- **unblockChat** - Unblock a bot chat.
- **unpinChannel** - Unpin a channel.
- **unpinSelf** - Unpin yourself from the action sheet.
- **unpinUser** - Unpin a user from the action sheet.
- **unsafeLink** - A link was determined to be unsafe.
- **updatePersonalTask** - Confirms a personal task has been successfully updated.
- **updatePlaybackSpeedVoicemail** - Voicemail playback speed value is changed.
- **updateTask** - Confirms update tasks action failed.
- **updateTaskState** - Confirms that the task state has been updated. action.
- **upgrade** - Selecting the **Upgrade** button in the **More** menu.
- **uploadFile** - A user selects **Upload from device**.
- **uploadSelectedFile** - Triggered under these circumstances:
  - Upload files in channel successfully.
  - Upload files in chat successfully.
  - Upload files in the reply window.
  - Upload files successfully in group chat.
  - Usage of core scenario.
  - The start of upload scenario in channel.
  - The start of upload scenario in chat.
  - The start of end of upload scenario in channel.
  - Upload a file into the **Files** tab successfully.
  - If a prompt is acted on during file upload.
  - If a selected file is uploaded successfully.
- **uploadSelectFile** - Select a file successfully; Select the **Upload file** button successfully.
- **urgentMessageSelect** - Selects an urgent message from the priority context menu.
- **urgentMessageSend** - Sends an urgent message.

- **url** - URL.
- **urlPreview** - URL preview.
- **urlPreviewAdd** - URL preview add.
- **urlPreviewOpen** - URL preview open.
- **urlPreviewRemove** - URL preview removed.
- **userConfiguration** - To view a pending time off request.
- **userJoinedViaShareLink** - A user joined a meeting from a link.
- **userLongPress** - Long press on a participant.
- **userProfileOpened** - A user selects a **User** icon to open a user profile.
- userTimesheetOpened** - A user selects a timesheet from a user's profile to open that person's timesheet.
- **useWifiForAudioDialog** - A user selects **OK** while the system prompts, while an Admin has blocked audio and video calls on cellular.
- **useWifiForVideoDialog** - Triggered when:
  - **OK** is selected while the system prompts, while an Admin has blocked video calls on cellular.
  - Trying to enable video in meeting, while an Admin has blocked it on cellular.
  - **OK** is selected while the system prompts, while an Admin has blocked video in meetings on cellular.
- **videoUserDoubleTap** - Double tap on a video participant.
- **viewChannelMembers** - View a channel members list.
- **viewContactCard** - ContactCard selected from:
  - A callHistory item.
  - A voicemail item.
  - A call list.
- **viewed** - A user viewed a page.
- **viewFullAllDayMeetingList** - Agenda view on Mobile.
- **viewLobbyFromBanner** - The number of times a user selects **View lobby** from a notification banner.
- **viewMeetingDetails** - Select the **...** menu on the Meeting Details page. Pertaining to the usage of the **More** menu on mobile calendars.
- **viewMeetingOccurrence** - Open up the meeting details of an instance of a recurring meeting. Telemetry to log user data across the calendar funnel, where calendar meeting details play an important role, that helps validate Selects Dial ins, Teams meetings, RSVPs, and so on.
- **viewMeetingSeries** - To log the successful rendering of a meeting series in the following circumstances:
  - When switching from an instance to the series meeting detail page.
  - When selecting **View series** from the meeting details page.
- **viewOrgChart** - Basic usage telemetry for an org chart.
- **viewRequests** - The **View requests** button is pressed.
- **voiceDataCollectionOptOut** - A user opts-out of the recording from mobile by clicking the banner.
- **voicemail - No AS Assigned** - A speaker taps on a voicemail item.

- **whiteboardUsed** - A user annotates on a whiteboard (any action on the webview).
- **wiki - No AS assigned** - Wiki usage telemetry.

Scenario

> **NOTE**
> For information on the properties of PanelAction events, see Properties sent with scenario events.

- **create_default_plan_and_nav_to_view** - Confirms successful creation of a default shared task list and how long it took for a user to land on the resulting view after action.
- **create_personal_plan_and_nav_to_view** - Confirms successful creation of a personal task list and how long it took for a user to land on the resulting view after action.
- **create_personal_task** - Confirms successful creation of a personal task item.
- **create_planner_plan_and_nav_to_view** - Confirms successful creation of shared task list and how long it took for a user to land on resulting view after action.
- **create_planner_task** - Confirms successful creation of shared task item.
- **delete_personal_plan** - Confirms the successful deletion of a personal task list.
- **delete_personal_task** - Confirms the successful deletion of a personal task item.
- **delete_planner_plan** - Confirms the successful deletion of a shared task list.
- **delete_planner_task** - Confirms the successful deletion of a shared task item.
- **get_sender_sub_scenario** - get sender sub scenario in activity.
- **load_chat_plans_list** - Confirms the successful fetching of planner plans for a chat's plan view.
- **load_home_page** - Confirms the successful fetching of both personal and shared tasklists for the main home view.
- **load_personal_task_list** - Confirms the successful fetching of a personal tasklist's tasks for the tasklist view.
- **load_shared_task_list** - Confirms the successful fetching of a shared tasklist's tasks for the tasklist view.
- **load_smart_task_list** - Confirms the successful fetching of a smart tasklist's tasks for the tasklist view.
- **rename_personal_plan** - Confirms the successful renaming of a personal task list.
- **rename_planner_plan** - Confirms the successful renaming of a shared task list.
- **update_planner_task_and_nav_to_view** - Confirms the successful updating of a shared task item and how long it took for a user to land on resulting view after action.
- **update_personal_task_and_nav_to_view** - Confirms the successful updating of a personal task item and how long it took for a user to land on resulting view after - **updatePlannerTask** - Confirms that a user has successfully updated a task in a shared taks list.

Property lists

Properties sent with all events

PROPERTY NAME	DESCRIPTION
EventInfo_Time	Event generation time
EventInfo_Name	Event name - Used to differentiate between event types
EventInfo_BaseType/name	Event type - Used to differentiate between event types in an event
EventInfo_Source	Source of the event generation

PROPERTY NAME	DESCRIPTION
AppInfo_Language	App language
AppInfo_ETag	Experiment ID assigned to a user
DeviceInfo_OsBuild	Build version of the OS
UserInfo_Mri	Type a user ID
Session_RunId	Type of a session ID
DeviceInfo_DetailModel	Model of the device
UserInfo_TimeZone	Time zone of the user
DeviceInfo_OsName	Device OS name
DeviceInfo_NetworkProvider	Device network provider
DeviceInfo_Model	Device Model
DeviceInfo_NetworkType	Device network type
UserInfo_Language	User language - similar to app language
client_ring/UserInfo_Ring	User ring that helps to release features to early adopters
UserInfo_Id	User ID
UserInfo_TenantId	Tenant ID
EventInfo_SdkVersion	SDK version used to generate the event
DeviceInfo_Id	Device ID provided by device OS
eventpriority	Priority of an event
DeviceInfo_Make	Device manufacturer
AppInfo_Version	Version of the app
DeviceInfo_OsVersion	Device OS version
Session_Id/SessionId	Session ID of the request
Session_Environment	Session Environment
isNetworkIssue	Captures info if there was a network issue while serving the request
UserRole	User role in a tenant

PROPERTY NAME	DESCRIPTION
Tenant_Model	Captures if the account is a freemium or enterprise account
licenseType/UserInfo_LicenseType	Licence type assigned to the user
UserLocale	Locale in which app is being accessed
Intune_sdkVersion	Version of the Intune SDK
Intune_sdkBundleVersion	Detailed version of the Intune SDK
AppInfo_Environment	Environment in which the app is being access

Properties sent with panelaction events

PROPERTY NAME	DESCRIPTION
Action_DestinationUri	Uri of the resource being accessed by user action
Panel_Uri	Uri of the panel delivered to the user
Action_Gesture	Type of gesture performed by user on the app
Action_ScenarioType	Feature grouping that relates to business metric for feature
Panel_Type	Panel type accessed by the user
Action_Outcome	Outcome of the action performed by user
Team_Id	ID of the team in which action was performed by the user
Module_Type	Type of the module which hosted user action
Module_Name	Name of the module which hosted user action
Module_Summary	Summary of the module that hosted user action
Thread_Id	ID of the thread that was accessed by user
Panel_PreviousUri	URI of the previous panel
Panel_Region	Region where the panel was hosted in the app
Panel_LaunchMethod	Method through which the panel was launched
Panel_PreviousType	Type of the previous panel
Thread_Type	Type of thread accessed by user
Module_State	State of the module accessed by user

PROPERTY NAME	DESCRIPTION
Action_Scenario	Feature inside a group of features that relates to business metric
Panel_LaunchSource	Source information of the panel that was launched
Tab_Type	Type of the tab accessed by user
Team_Type	Type of team accessed by user

Properties sent with panelview events

PANEL_URI	URI OF THE PANEL DELIVERED TO THE USER
Panel_Type	Panel type accessed by the user
Team_Id	ID of the team in which action was performed by the user
Thread_Id	ID of the thread that was accessed by user
Panel_PreviousUri	URI of the previous panel
Panel_Region	Region where the panel was hosted in the app
Panel_LaunchMethod	Method through which the panel was launched
Panel_PreviousType	Type of the previous panel
Thread_Type	Type of thread accessed by user
Panel_LaunchSource	Source information of the panel that was launched
Tab_Type	Type of the tab accessed by user
Team_Type	Type of team accessed by user

Properties sent with scenario events

PROPERTY NAME	DESCRIPTION
Scenario_Status	Status of a scenario - Abandon/OK/ERROR
Scenario_Step	When a scenario contains multiple steps with different failure points, this property captures details about the step
Scenario_StatusCode	Property records status code of the scenario based on scenario success or failure

Properties sent with trace events

PROPERTY NAME	DESCRIPTION
Trace_message	Contains error string and details about the reasons due to which a failure might have happened

Required desktop diagnostic data for Microsoft Teams

9/18/2020 • 15 minutes to read • Edit Online

The following article contains a list of Microsoft Teams desktop events, and lists of properties each event collects.

Events

> **NOTE**
>
> There are common properties for all events listed below, to review them, see Properties sent with all events.

Logging

> **NOTE**
>
> For information on the properties of Logging events, see Properties sent with logging events.

- **adal-anonymous-mac.ts:this.logger.logError** - Records that a generic sso error occurred when logging in anonymously on a Mac device.
- **adalAnonymousUtil.ts:loggingService.getInstance** - Records error statement logging that the app could not launch anonymous user authentication.
- **adal-anonymous-windows.ts:this.logger.logError** - Records that a generic sso error occurred when logging in anonymously on a windows device.
- **adalBase.ts:this.loggingService.logError** - Records information needed to determine that the user profile is null or empty.
- **adal-impl-mac.ts:this.loggingService.logError** - Records the occurrence of an issue when parsing telemetry received during authentication or genaric sso error occurred when logging in on a Mac device.
- **adal-rigel-windows.ts:this.logger.logError** - General logging statement indicating a generic sso error occurred when logging in on our Meeting room device.
- **adal-sso-windows.ts:this.loggingService.logError** - Records that a generic sso error occurred when logging in on a Windows device, errors in initiating the chat service or log in failure information.
- **appOnlineService.ts:loggingService.getInstance** - Records the occurrence of an error due to settings that could not be parsed during startup or with downloading pre-user authentication, pre-authorized settings.
- **appStart.ts:loggingService.logError** - Records the occurrence of an error when the application could not launch, disk space error, valid certificate error or failed to find the correct certificate, and restarting the app.
- **browserWindowHttp.ts:this.loggingService.logError** - Records information to indicate that the application could not be updated due to issues with the file system.
- **contextInstallService.ts:loggingService.getInstance** - Records the occurrence of an error when:
  - attempting to parse or read a file or resolve a URL critical to the contextual install feature.
  - the URL shortener attempts to run the contextual install feature.
- **crashManager.ts:loggingService.logError** - Records information to determine the cause of an error when the application crashes.
- **localStorageService.ts:loggingService.getInstance** - Records the occurrence of an error when essential boot data does not load properly to run the application.
- **logProviders\pageDumpProvider.ts:loggingService.getInstance** - Records error information when the application crashes.

- **multiWindowManager.ts:this.logError** - Records the occurrence of an error when essential boot data does not load properly to run the application.
- **nativeElectronNotifications\osNotificationService.ts:this.loggingService.logError** - This event records the occurrence of an error whenattempting to launch a notification about a failure.
- **OutlookMeetingAddinHelper.ts:loggingService.getInstance** - Records the occurrence of an error when attempting to connect to a meeting using the Outlook meeting addin.
- **recoveryManager.ts:loggingService.getInstance** - Records the occurrence of an error during update rollbacks.
- **renderer\startPage\startPage.ts:this.logger.logError** - Records the occurrence of an error with the application start page.
- **settingsService.ts:loggingService.getInstance** - Records the occurrence of an error with the application settings.
- **updateInfo.ts:loggingService.getInstance** - Records the occurrence of an error with transmitting updates.
- **updatenotification.js:this._loggingService.logError** - Records the occurrence of disk space issues.
- **utility.ts:loggingService.logError** - Records an error accessing a local file (a file in the application).
- **utility.ts:loggingService.getInstance** - Records an error in available diskspace, display issues, url issues, cookie issues, protocols, or regkey issues on machine to load the application.
- **windowmanager.js:this._loggingService.logError** - Records the occurrence of cookie issues, whitescreen issues, issues between desktop and shell communication, url issues,errors with loading page messages, errors with process rendering, and network connectivity issues.
- **windowmanager.js:loggingService.getInstance** - Records information to indicate when the recovery window cannot br shown.

Outlook addin

> **NOTE**
> For information on the properties of Outlook addin events, see Properties sent with Outlook addin events.

- **joinmeetingoperation** - Records information needed to join a user to a meeting.
- **meetingaddinapplifecycle** - Records information regarding app state such as Launch or Exit.
- **meetingaddinloadtime** - Records the time it takes to load meeting information from Outlook.
- **openmeetingoperation** - Records information needed to open a scheduled meeting.
- **savemeetingoperation** - Records information needed to save the meeting while scheduling it.

Scenario

> **NOTE**
> For information on the properties of Scenario events, see Properties sent with scenario events.

- **desktop_app_load** - Records information needed to determine that the desktop application has launched, that the service should be initialized, and that it is able to be initialized.
- **desktop_app_not_ready** - Records information needed to determine that the desktop application is not ready to function.
- **desktop_install** - Records information needed to determine that the desktop application has been installed successfully, or that it failed to install.
- **desktop_previous_lifecycle_invalid** - Records information needed to determine that the desktop application restarted after it had been previously been running and then crashed.

Tracking

NOTE

For information on the properties of Tracking events, see Properties sent with tracking events.

- **deeplink_scenario_missing** - Teams was launched from an deeplink, but the telemetry/diagnostic is not present.
- **desktop_app_initialized** - Records information needed to determine if the application has successfully started when the desktop application is initialized.
- **desktop_app_quit_exception** - The application crashed while attempting to close.
- **desktop_blankScreenDetected** - Records information needed to determine errors when the desktop application renders a blank screen.
- **desktop_blankScreenDetectedAfterRepaint** - Detected that page was blank upon detecting rendering attempt.
- **desktop_blankScreenRecoveredAfterRepaint** - Recovered from an rendering issue where the screen was not rendered earlier.
- **desktop_configuration_failed_to_save** - Collects information needed to determine configuration errors when desktop settings have failed to save.
- **desktop_navigation_error_recovery** - Collects information needed to determine desktop navigation errors when a page fails to load after five attempts.
- **desktop_previous_gpu_crashed** - Records information needed to determine graphics processing unit errors when the desktop crashes.
- **desktop_previous_plugin_host_crashed** - Collects information need to determine media stack issues associated with desktop application crashes.
- **desktop_recovery_cleared_user_data** - Records application crashed multiple times, and app had to clear local cache to recover.
- **desktop_settings_blank_on_load** - This is an error that the applications settings are not present.
- **desktop_settings_failed_to_load** - Collects information needed to determine cause when desktop settings fail to load.
- **desktop_silent_restart** - Client update is staged and client is updated without user disruption.
- **desktop_terminated** - Records information needed to determine whether the inter-process communication has been disconnected when the user closes the desktop application.
- **desktop_uncaught_exception** Function call on an undefined object, this will result in a crash/app restart.
- **desktop_write_storage_failed** - Records information needed to determine disk errors when the desktop application fails to write to storage.
- **registration_failed** - Records information needed to resolve add-in registration failures.
- **registration_success** - Records information needed to determine whether add-in registrations where successful.
- **security_unsupported_ipc_channel** - Interprocess message that was not permitted was inbound.
- **sfb_running_not_connected** - Detected that the Skype for Business app is not running.
- **sfb_not_running** - Records that the 'wait for response' from call to Skype of Business timed out.
- **sfb_never_replied** - Tracks no API response when communicating with Skype for Business.
- **server_error_hit** - Tracks that an error from the ipc pipes communicating with Skype for Business.
- **unexpected_sfb_ipc_disconnection** - Records information needed to determine a failure to connect to the service.
- **unregister_failed** - Records information needed to determine errors in de-registering the Outlook meeting add-in.

UserBI panelaction

> **NOTE**
> For information on the properties of UserBI panelaction events, see Properties sent with UserBI panelaction events.

- **inlinereply** - Records information whether a user has replied from the notification.
- **toastclick** - Records a user's click to navigate to the message entry to toast notifications to monitor service SLA and to load the appropriate response to toast notification.
- **toastdismiss** - Records information needed to determine errors and delays when the user dismisses the rendering of a toast notification.
- **toast_skip** - Records information needed to avoid transmitting a delayed toast notification.
- **toasttimeout** - Records information needed to determine errors and delays when the rendering of a toast notification has timed out.

UserBI panelview

> **NOTE**
> For information on the properties of UserBI panelview events, see Properties sent with UserBI panelview events.

- **toastshow** - Records information needed to determine that a toast was rendered.

Property lists

Properties sent with all events

PROPERTY NAME	DESCRIPTION
EventInfo_Time	Event generation time
EventInfo_Name	Event name - Used to differentiate between event types
EventInfo_BaseType/name	Event type - Used to differentiate between event types in an event
EventInfo_Sequence	Sequence of the event
userAgent	Browser agent string
userpdclevel	Privacy data control setting of the user
eventpdclevel	Privacy data control categorization level of the event
AppInfo_Language	App language
clientType/AppInfo_ClientType	Client type where the app is running
environment/AppInfo_Environment	Engineering environment that served the user request
clientVersion/appversion/AppInfo_Version/desktopBuildVersion	Version of the app

PROPERTY NAME	DESCRIPTION
buildtime	timestamp that the app was built in engineering systems
osversion/DeviceInfo_OsVersion	OS version
AppInfo_ProcessArchitecture	System architecture (32bit/64bit)
preferredLocales	preferred locale for the user
locale/AppInfo_Locale	App locale
os/DeviceInfo_OsName	OS Name
UserInfo_Language	Selected user language
UserInfo_Id	User ID
UserInfo_TenantId/TenantId	Tenant ID
ring/UserInfo_Ring	Concept that helps deliver application in a phased manner
region	Datacenter region that served user's request
UserInfo_ConfigIds/UserInfo_Etag	ID that helps identify users in different experiments/rollouts
DeviceInfo_BrowserName	Browser name
DeviceInfo_BrowserVersion	Browser version
DeviceInfo_Id/machineId/DeviceInfo_IdV2	ID that helps identify the device
totalMemory	Hardware memory of the device
cores	Hardware cores of the device
cpuspeed	Hardware cpu speed of the device
DeviceInfo_CpuArchitecture/cpuarchitecture	CPU architecture of the device
UserRole	Helps identify user role in a tenant
DeviceInfo_WindowsMode	Helps identify Windows security mode
desktopSession/Session_Id	Helps identify a session
dbOpen	Captures state of the local database
UserInfo_Upn	One sided hash of user identifier

Properties sent with logging events

PROPERTY NAME	DESCRIPTION
message	Captures a detailed message about the log

Properties sent with scenario events

PROPERTY NAME	DESCRIPTION
Scenario_Status	Status of a scenario
Scenario_Step	Step in a scenario
sequence	Sequence number of the scenario
delta	Time taken to complete different steps in a scenario
elapsed	Time since the scenario started
scenario	Uniquely identify a scenario
Scenario_Name	Name of the scenario
errorInfo	Info of the error that might have occurred during a scenario
session	Unique session ID
freeMemory	Captures free memory available
processMemory	Captures process memory
scenarioDelta	Captures time different between 2 scenario steps
Session_DesktopId	Unique session ID
machineLocked	Captures if the machine was locked or not
windowIsVisible	Captures if the app window was visible to use
appStates/webAppStates	records a list of app states that the app went through. This helps with crash investigation because we can see what state the app was in
crashDesktopSession	Captures ID of the crashed session
appRuntime	Captures runtime of the app
diagnosticEvents	Last 50 web app diagnostic events before app crash
activities	Last 50 user scenario names which happened before crash
crashSession	Captures ID of the crashed session
crashId	Captures ID of the crashed session

PROPERTY NAME	DESCRIPTION
isPreviousLifecycleValid	Whether previous app was fully initialized and terminated successfully
isSettingValid	Whether preauth settings are valid
rollbackReason	Reason due to which app was rolled back
deeplinkType	Type of the deeplink
watchdogCrash	Whether app crashed due to hang
protocols	Protocol used to launch the app
electronBuild	Build version of electron app
distribution	whether Teams was installed via exe or msi or dmg or pkg, etc.
updateTimeOfDay	Time the app was updated
launchPath	whether Teams is installed in %LOCALAPPDATA%, %PROGRAMFILES%, or other locations
loggedIn	If the user was logged in
envType/complianceEnvironmentType	Commercial cloud or private (e.g. DoD, GCC-High, etc.)
cpuusage	CPU usage
installationSource	Type of installation user has
adalVersion	Version of the auth library
asyncStart	Is the app using synchronous or asynchronous start
attempts	Number of online check attempts made for the user before showing a blocking screen

Properties sent with tracking events

PROPERTY NAME	DESCRIPTION
name2	Captures name of the tracking event
numVisibleNotifications	Number of visible application notifications
giphyEnabled	Whether giphy service was enabled
error	Captures error details related to the tracking event
method	Protocol method GET or POST

PROPERTY NAME	DESCRIPTION
channel	Captures inter-process communication channel within the app
windowTitle	Type of display window associated with event
message	The type of error message
crashSession/crashDesktopSession/crashId/Session_DesktopId /Session_DesktopBackgroundId	Captures unique ID for session debug purposes
responseCode	Captures response code for the service call
errorUrl	The URL that failed to load
errorCode	Captures error code
ssoEventData	Authentication state and status
correlationId	ID to correlate events with service side for debug purposes
errorDescription	Captures description of the errorcode
source	Method to get the Teams app and what package type Teams was installed from
windowIsDestroyed	True/False state of Application Windows during event
windowIsFocused	True/False state of Application Windows during event
windowIsVisible	Was the application visible when event happened
windowIsMinimized	True/False state of Application Windows during event
windowIsMaximized	True/False state of Application Windows during event
windowIsFullscreen	True/False state of Application Windows during event
distSrc	Captures the distribution source of user landing into the app
retries	Retry count when attempting to connect to an endpoint
uses_slimcore	True or false if web call is using slimcore
persistCookieExpiresIn	Time remaining in validity of web application cookie
tenantName	Name of tenant for user of the application
appStartReason	How the application session started such as user initiated, after updating, etc.
machineLocked	Whether machine was locked or not locked during the event

PROPERTY NAME	DESCRIPTION
data	Captures technical data for scenario investigation
appRuntime	Captures runtime of the app
activities	Last 50 user scenario names which happened before crash
timeSinceActivity	Time since last user activity
appStates	Records a list of app states that the desktop app went through, which helps with crash investigations because it shows what state the desktop app was in
timeSinceAppState	Time since the app state changed
webAppStates	Records a list of app states that the web client went through, which helps with crash investigations because it shows what state the web client app was in
timeSinceWebAppState	Time since the web app state changed
diagnosticEvents	Last 50 web app diagnostic events before app crash
timeSinceLastDiagnosticEvent	Time since last diagnostic event sent
timeSinceSecondLastDiagnosticEvent	Time since second-last diagnostic event sent
appInitialized	Whether webapplication has started
targetVersion	Version application is going to be updated to
port	Internet message port number
originalUrl	Original location of page being rendered
deeplinkId	GUID for destination type of Teams link
appSessionEnd	Whether event occurred at end of application session
eventData	Captures machine state and app config to help debugging in case of issues
deeplinkType	Type of the deeplink (chat, meeting, channel)
previousUpdateUrl	Location where application last retrieved its update from
previousUpdateVersion	Last version application was updated to
previousUpdateTime	When application binaries were last updated
protocol	Handler type for link, such as file or image

PROPERTY NAME	DESCRIPTION
files	Type of file associated with an event, such as Application cache or GPU cache
Perf_WorkingSetSizeKB	Size of memory cache
isTimeboxingWebAppInitialize	Whether app initialized before time box counter ran out
isExp	Whether the app version in use is part of an experiment
deviceType	Captures type of the device
sanitizedErr	Captures sanitized version of the error information
rigelVersion	Captures version of rigel device
DeviceInfo_OsSku	Captures OS SKU information
isLoggedOut	Captures if the user is logged out
complianceEnvironmentType	Commercial cloud or private (e.g. DoD, GCC-High, etc.)
restartTimes	Exact times of previous restarts
Skype_ResultCode	Captures result of interop communication between Skype and Teams
cpumodel	Captures model of CPU
isSlimCoreRunningOutproc	Whether Slimcore component is running in its own process
isSlimCoreStartedAsync	Type of launch of internal audio/video (A/V) stack
networkState	Captures state of the network
desktopBuildAge	How old the application build is at event time
vdiMode	Captures if the app is running in VDI mode

Properties sent with UserBI panelview events

PROPERTY	DESCRIPTION
Panel_Uri	Uri of the panel delivered to the user
Panel_Type	Panel type accessed by the user
Team_Id	ID of the team in which action was performed by the user
Thread_Id	ID of the thread that was accessed by user
Panel_PreviousUri	URI of the previous panel

PROPERTY	DESCRIPTION
Panel_Region	Region where the panel was hosted in the app
Panel_LaunchMethod	Method through which the panel was launched
Panel_PreviousType	Type of the previous panel
Thread_Type	Type of thread accessed by user
Panel_LaunchSource	Source information of the panel that was launched
Tab_Type	Type of the tab accessed by user
Team_Type	Type of team accessed by user

Properties sent with UserBI panelaction events

PROPERTY NAME	DESCRIPTION
Action_DestinationUri	Uri of the resource being accessed by user action
Panel_Uri	Uri of the panel delivered to the user
Action_Gesture	Type of gesture performed by user on the app
Action_ScenarioType	Feature grouping that relates to business metric for feature
Panel_Type	Panel type accessed by the user
Action_Outcome	Outcome of the action performed by user
Team_Id	ID of the team in which action was performed by the user
Module_Type	Type of the module which hosted user action
Module_Name	Name of the module which hosted user action
Module_Summary	Summary of the module that hosed user action
Thread_Id	ID of the thread that was accessed by user
Panel_PreviousUri	URI of the previous panel
Panel_Region	Region where the panel was hosted in the app
Panel_LaunchMethod	Method through which the panel was launched
Panel_PreviousType	Type of the previous panel
Thread_Type	Type of thread accessed by user

PROPERTY NAME	DESCRIPTION
Module_State	State of the module accessed by user
Action_Scenario	Feature inside a group of features that relates to business metric
Panel_LaunchSource	Source information of the panel that was launched
Tab_Type	Type of the tab accessed by user
Team_Type	Type of team accessed by user

Properties sent with Outlook addin events

PROPERTY NAME	DESCRIPTION
AccountComparisonFailedReason	Addin compares the account with Teams account to see if creation is allowed, this event is sent if the comparison fails
AccountComparisonSuccessful	Addin compares the account with Teams account to see if creation is allowed, this event is sent if the comparison is successful
AdalVersion	Version of the authentication library used
AddinBitness	Version of addin
AddinLanguage	Language of addin strings being used
AggregatorSetupCompletedTime	Setup time for addin loader
AppDomainCreatedTime	Time when addin loader initializes app domain
AppointmentDisplayTime	Time at which the appointment item was displayed during meeting creation
AuthenticationCompletedTime	Time at which authentication was provided for a given request
ConnectionMode	Indicates the connection mode of the user's primary Exchange account
ConnectionStartedTime	Time when Outlook calls OnConnection
ErrorDetails	Captures details of the error
ErrorName	Captures name of the error
ExchangeVersion	Captures version of Exchange
IsSmtpFormatError	Error in SMTP address
IsTeamsRunning	Captures if there is a Teams process running

PROPERTY NAME	DESCRIPTION
IsTeamsUserLoggedOut	Captures if the user is logged out of Teams
LanguageSetupCompletedTime	Time at which language setup got completed
ManagedConnectTime	Time when the managed add-in received the connect callback
ManagedOnStartupTime	Time when managed started the startup
MTFetchCompleted	Time when MT meeting options request is completed
NetFrameworkVersion	.nET framework used
NetworkAvailable	Is network available
OperationStartTime	Time when different operations started
OsBitness	Bitness of OS
OutlookLanguage	Captures language of the Outlook app
OutlookVersion	Captures version of Outlook app
OwnerResolutionTime	Time to resolve the meeting owner
ParseResponseCompletedTime	Time when parsing of response completed
RecipientResolutionError	Error details when resolving a recipient
RecipientsResolutionTime	Total time to resolve all recipients
RehydrateCompletedTime	Time when properties are read from Outlook
SaveToOutlookCompletedTime	Time when properties are saved to Outlook
ServiceRequestStartTime	Start time of the service request
ServiceResponseReceiveTime	Time of response from the service
SettingsInitializeCompletedTime	Time when settings initialized
SetupLoggingCompletedTime	Time when logging was set up
ShutdownBeginTime	Time when shutdown of addin begins
ShutdownCompletedTime	Time when shutdown completed
StartupBeginTime	Time when startup of addin begins
StartupCompletedTime	Time when startup completed

PROPERTY NAME	DESCRIPTION
TeamsDeployment	Deployment of Teams client (Dev, Prod)
TeamsRing	Ring of current user logged into Teams client
TeamsVersion	Captures version of Teams app
TelemetrySetupCompletedTime	Time when telemetry setup is completed
UpnMismatch	Whether theres a upn mismatch between outlook and teams
UserDomain	Domain of the user
ViewUpdatedTime	Time when the view got updated

Overview of optional connected experiences in Microsoft Teams

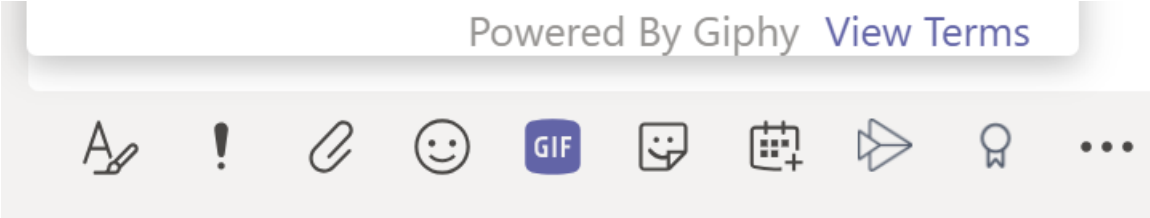
10/13/2020 • 2 minutes to read • Edit Online

If you have a work or school account, your organization's admin may have provided you with the ability to use one or more cloud-backed services (also referred to as **optional connected experiences**) while using Microsoft Teams, like GIPHY and/or URL Preview service. These cloud-backed services are optional. Whether you use them is up to you. They're offered to you under terms that differ from theMicrosoft Online Service Terms, as described separately for each optional service. This article lists our Teams cloud-backed services.

> **NOTE**
>
> If you're an admin, see the Manage privacy controls article to learn how to give or restrict your users' ability to use optional connected experiences.

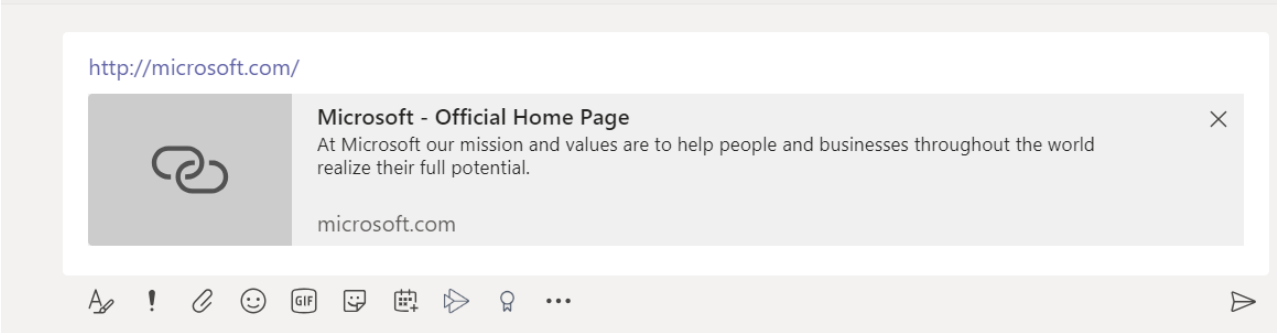
GIPHY

GIPHY is a cloud-backed service that lets you use GIFs in your Teams chats. If you're in **Teams** > **GIF** > **Search**, the search terms are sent to GIPHY. These experiences, if allowed by your admin and after you choose to use them, are subject to the GIPHY Privacy Policy and Terms of Service.



URL Preview service

The URL Preview service automatically generates a preview snippet and attaches under the snippet the URL when a user sends a URL string. This service will make a request to the service URL as the user is typing the message.



Related articles

- Overview of privacy controls for Microsoft 365 Apps for enterprise
- Overview of policy controls for Teams
- Privacy and Microsoft Teams
- Required service data for Office

- Account Privacy Settings

Operate your service

7/8/2020 • 28 minutes to read • Edit Online



This article is part of the Operational Excellence stage of your upgrade journey, which begins as soon as you've completed your upgrade from Skype for Business to Teams.

This article gives an overview of the requirements for successfully operating Teams for your organization after you've upgraded. By properly operating your Teams services, you can be sure you're providing a high-quality, reliable experience for your organization.

Introduction to the Operations Guide

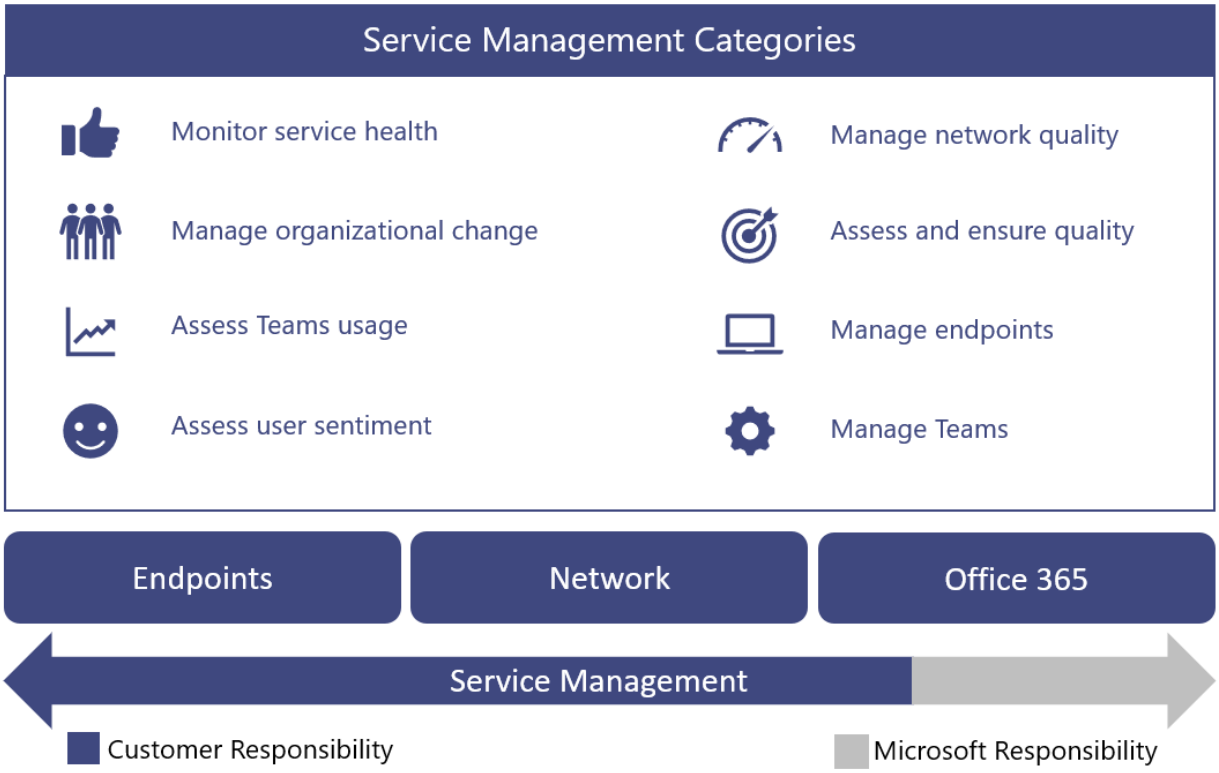
The Operations Guide gives you an overview of all the tasks and activities required as part of the service management function for Microsoft Teams.

Service management is a broad topic that covers day-to-day operations of the Microsoft Teams service after it has been deployed and enabled for users. The Teams service encompasses Microsoft 365 or Office 365 and the infrastructure components that are deployed on-premises (for example, networking).

The notion of service management is most likely not a new concept for most organizations. You might have already implemented processes and tasks that are associated with existing services. That said, you can probably augment your current processes when you plan for service management today to support Teams in the future.

Service management encompasses all the activities and processes involved in managing Teams end to end. As noted earlier, some components of service management—the infrastructure that the Microsoft 365 or Office 365 service itself comprises—are Microsoft's responsibility, whereas you, the customer, are accountable to your users to manage the various aspects of Teams, the network, and endpoints you provide.

The tasks and activities in this guide are grouped into eight categories as depicted in the following diagram. Each of these categories will be expanded upon in the following sections.



Decision points	• Decide how operations will be implemented for Teams.
Next steps	• Review the Operations Guide in full. • Implement an operations strategy that aligns with your organization's goals to deliver the quality and reliability of Teams workloads. • Review the Quality of Experience Review guide. • Implement an operations strategy to regularly perform Quality of Experience Reviews to make sure your Teams deployment is operating at its peak capabilities.

Operational role mapping

The planning you undertook for operations during the Envision phase is critical, because operations activities begin when the first pilot users are enabled. This guide lists the activities and tasks that must be performed on a daily, weekly, monthly, or as-needed basis to maintain a high-quality Teams deployment. This guide provides knowledge and guidance for how to perform these critical activities and tasks.

One crucial component of a successful deployment is to ensure that the planning you do early in the Envision phase includes determining who will be responsible for performing specific activities. After you've figured out which tasks and activities apply to your deployment, they need to be understood and followed by the groups or individuals that you assign to them.

Each team you identify must review and agree on the tasks and responsibilities identified and start preparation. This might include training and readiness, providing updates to the staffing plan, or ensuring that external providers are ready to deliver.

The activities and roles defined in this guide should be valid in most scenarios, but every Teams deployment is unique; therefore, you can use this guide as a starting point to customize the activities and default roles to meet your needs.

Ensure that each accountable team has a good understanding of the activities that are required to run the service.

It's critical that each team accepts and signs off on their accountability in your organization before the first pilot begins.

After an agreement is in place, the corresponding teams should start to operationalize their roles.

Next steps	• Use this document to facilitate the operational role mapping exercise. • Meet with the respective support teams to assign names to each item in the list of required activities. • Gain acceptance or sign-off on the assigned roles. • Ensure that the corresponding teams have the appropriate training, readiness, and resources to complete the activities required of them.

Teams service dependencies

Microsoft Teams brings together technologies across Microsoft 365 and Office 365 to provide a hub for teamwork. Examples include:

- Azure Active Directory (Azure AD) provides authentication and authorization services for Teams.
- Exchange Online provides advanced features like legal hold and e-discovery.
- SharePoint Online provides the ability to share files in channels, and OneDrive for Business provides a mechanism for sharing files within a private chat.

Organizations can also leverage existing investments in on-premises infrastructure. For example, existing on-premises Active Directory accounts can be used for authentication by leveraging Azure AD Connect. Certain versions of Exchange Server can be used in place of Exchange Online.

These technologies come together to provide a rich, collaborative, and intelligent communications suite for users. This tight integration is a key benefit of Teams, but it also drives a requirement for service management across these technologies.

This guide covers the key areas of focus to manage the Teams service. Most likely, you have service management plans in place for the supporting technologies that Teams depends on. If not, you'll need to establish proper service management plans for those technology components (both on-premises and online) as well. This will help ensure your users enjoy a high-quality, reliable experience with Teams.

References

Overview of Microsoft Teams

How Exchange and Microsoft Teams interact

How SharePoint Online and OneDrive for Business interact with Microsoft Teams

Microsoft Teams and Skype for Business coexistence and interoperability

Operations Guide activities

The following sections give an overview of the activities that are required to successfully operate the Microsoft Teams service. They include reference to tools, contextual information, and additional content to help you understand the activity and to assist in readiness initiatives.

Monitor service health

It's important that you understand the overall health of the Microsoft Teams service so that you can proactively alert others in your organization of any event that affects the service. As described earlier, Teams is dependent on other Microsoft 365 and Office 365 services such as Azure Active Directory, Exchange Online, SharePoint Online,

and OneDrive for Business. Because of this, it's equally important that you monitor the health of the dependent services.

Incorporate this activity into your incident management process to proactively inform users, the helpdesk, and your operations teams to prepare to handle user escalations.

The following sections describe the tools that you can leverage to monitor for service incidents that affect the Teams service. A summary of the benefits of each tool, and when you should use each one, is included in the following table.

MONITORING TOOL	BENEFITS	WHEN TO USE
Microsoft 365 admin center	Available from any device with a supported browser.	Use when you don't need real-time notifications.
Microsoft 365 Admin app	Provides push notifications to your mobile device.	Use when you need to be notified of service incidents while you're on the go.
Microsoft System Center	Integration with Microsoft System Center.	Use when you need advanced monitoring capabilities and notification support.
Microsoft 365 Service Communications API	Programmatic access to Microsoft 365 or Office 365 service health.	Use when you need integration with a third-party monitoring tool or want to build your own solution.

> **NOTE**
> Only individuals who are assigned the **global admin** or **service administrator** role can view service health.

Monitoring with the Microsoft 365 admin center

The Microsoft 365 admin center provides a Service Health dashboard where you can view the current health of the Teams service in addition to dependent services.

Monitoring with the mobile app

The Microsoft 365 Admin app is available on Apple iOS, Android, and Windows (PC and mobile). The app provides service administrators information about service health and upcoming changes. The app supports push notifications that can alert you almost immediately after an advisory has been posted. This helps you stay current on the status, health, and any upcoming changes to the service. The notification support makes it the recommended monitoring tool for administrators. For more information, see:

Microsoft 365 Admin Mobile App

Download the Microsoft 365 Admin Mobile App

Monitoring with Microsoft System Center

Microsoft System Center is an integrated management platform that helps you manage datacenter, client devices, and hybrid cloud IT environments. Microsoft 365 or Office 365 administrators who use System Center now have the option to import the Management Pack, which enables them to view all service communications within Operations Manager in System Center. Using this tool gives you access to the status of your subscribed services, active and resolved service incidents, and your Message Center communications (upcoming changes). For more information, refer to the following blog post.

If you leverage System Center to monitor Teams service health (and dependent services), you can further customize the management pack to alert or notify specific groups or individuals who have been identified to react

to incidents. These groups can include service owners, helpdesks, second-level and third-level support groups, and incident managers in your organization.

Monitoring for advanced scenarios

You can monitor service health and upcoming changes by leveraging the Service Communications API to access service health and changes programmatically. Use this API to create your own monitoring tool, or connect your existing monitoring tools to Microsoft 365 or Office 365 service communications, potentially simplifying how you monitor your environment. For more information, see Microsoft 365 or Office 365 for Enterprise developers.

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Monitor service health	Proactively monitor Microsoft Teams service health, (and dependent services) by using the tools available. Dependent services include: Exchange Online, SharePoint Online, OneDrive for Business, Azure Active Directory.	Real-time	
Incident notification	Notify internal stakeholders of events that affect the Teams service. Internal stakeholders can include users, helpdesks, and incident managers.	As needed	

References

How to check Microsoft 365 or Office 365 service health

Verify service health for Microsoft Teams

Service Health and Continuity

Manage organizational change

Microsoft Teams is a cloud-based service. With that comes the ability to provide new features and functionality at a rapid pace. Delivering ongoing innovation provides an obvious benefit to organizations, but these changes need to be managed appropriately within your organization to avoid user resistance or escalations to your helpdesk.

Updates to Teams are rolled out automatically to your users. Your users will always have the latest client and features available in the Teams service. It's not possible to manage the rollout of Teams updates to your users, therefore it's critically important to manage change through effective communication, training, and adoption programs. If your users are aware of the change, educated about the benefits, and empowered to leverage the new capabilities—they'll be able to adapt more quickly and welcome the change.

Monitoring for change

The first step in change management is monitoring the changes that are planned for Teams. The best source for monitoring these changes is the Microsoft 365 Roadmap, which lists features that are currently in development, being rolled out to customers, or have fully launched. You can search for Teams-specific features by using the filter provided, or you can download the roadmap to an Excel file for further analysis. For each feature, the roadmap gives a short description, along with the anticipated release date.

In the Microsoft Teams blog, you can learn about best practices, trends, and news about Teams product updates. Expect to find major feature updates to Teams to be announced here. You can also subscribe to the blog through an

RSS feed. You can then add the RSS feed directly into a Teams channel, so all the important news is delivered directly inside of Teams.

All features that are released are documented in the Release Notes for Microsoft Teams. Here you'll find a list of features that were released for desktop, web, and mobile devices. The same set of release notes are also available on the **What's new** tab in Help.

Become familiar with the resources available, and ensure that you assign applicable owners to monitor for change.

Planning for change

Now that you're aware of upcoming changes to the Teams service, the next step is to prepare and plan accordingly. Assess each change to determine which changes require communication to users, awareness campaigns, training for support teams or users, or feature evaluation and adoption campaigns. This is the primary role of a change management team in your organization. Below is a collection of sample tables that can help you plan for change.

Feature: Cloud Recording (Release date: January 2018)

General track

CHANGE READINESS	STATUS	NOTES/NEXT STEPS	OWNER
Legal review	Completed	This feature is a prerequisite to onboarding the training team.	Project team

Technical change management

CHANGE READINESS	STATUS	NOTES/NEXT STEPS	OWNER
IT changes required	Yes	Admin needs to enable recording for identified users only.	Support team
Technical readiness complete	Yes		Support team

User change management

CHANGE READINESS	STATUS	NOTES/NEXT STEPS	OWNER
User impact	Low		
User readiness required	Yes		
Communications ready	No	Communication email has been drafted—pending review.	Communications Team
Training ready	Yes	Training will leverage existing Microsoft video.	Training Team

Status track

CHANGE READINESS	STATUS	NOTES/NEXT STEPS	OWNER
Release status	in progress	Pending review by executive sponsor.	Change Management Team

CHANGE READINESS	STATUS	NOTES/NEXT STEPS	OWNER
Release sign-off			
Release date			

For more information about planning for change management with Teams, see Create a change management strategy for Microsoft Teams.

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Monitor for change	Monitor for upcoming changes to Microsoft Teams service.	Daily	
Planning for change	Evaluate and plan for new features and capabilities, including communication plans, awareness campaigns, and training.	As needed	
User readiness	Perform targeted communication, awareness, or training campaigns to ensure users are ready for the upcoming change.	As needed	
Support team readiness	Perform targeted communication, awareness, or training campaigns to ensure the support team is ready. Support teams can include the "white glove" team, helpdesks, Tier 2 or Tier 3 support, external partners, and so on.	As needed	

Assess Teams usage

After the initial pilot begins, it's critical to establish a regular cadence for measuring actual Teams usage. This enables your organization to gain insights into how actual usage aligns with the usage you predicted during the Envision phase. Although this section focuses on Teams usage, this should be part of a broader effort to measure and assess Microsoft 365 or Office 365 usage overall.

Reviewing usage frequently early in the deployment gives you the opportunity to:

- Validate whether users are using Teams.
- Identify potential adoption challenges before they create critical issues across the organization.
- Understand whether there are discrepancies between the Envision phase requirements and actual usage.

If usage isn't what you expect, this could be due to a deployment issue, or the adoption plan isn't being executed properly, or some other problem. Depending on the actual reason behind the low usage, the service administrator must collaborate with the related teams to help remove usage barriers.

Measuring usage with the Microsoft 365 admin center

Usage data from Teams is available in the Reporting dashboard. Teams usage data can be found in three different reports. The first report provides a cross-product view of how users communicate and collaborate by using the various services in Microsoft 365 or Office 365. This report can be found here: Microsoft 365 Reports in the admin center - Active Users

The other two reports are Teams-specific, and they provide further detail about Teams usage from a user and device perspective. Both reports can be found here:

Microsoft Teams device usage report

Microsoft Teams user activity report

Required permissions

The usage reports in the admin center can be accessed by people who have been assigned a **Global administrator** role, or a product-specific admin role (**Exchange administrator**, **Skype for Business administrator**, **SharePoint administrator**).

In addition, the **Reports reader** role is available for users who require access to the reports, but don't perform any tasks that require administrator-level permissions. You assign this role to provide usage reports to anyone who is a stakeholder, to monitor and drive adoption. For more information about the different roles available, see About Microsoft 365 admin roles.

Assessing usage

After you've used the Reporting dashboard to measure usage, it's important to compare the measured usage against any key success indicators (KSIs) that you defined during the project's Envision phase. You can define a KSI that might be defined as active usage, or one that's indirectly linked to active usage.

It's important to identify any variances between actual and planned usage before resuming the rollout to additional sites or users. You'll likely identify organizational learnings as part of this activity that you can leverage to ensure that the next batch of sites or users don't encounter the same issues.

First, pinpoint whether this is an adoption or technical problem. Begin by investigating the items below, in order, to determine where the problem is.

1. Validate quality by performing a Quality of Experience Review.
2. Work with the helpdesk team to check that there are no trending technical issues preventing users from accessing or using the service. If issue trends do exist, use the endpoint troubleshooting section later in this article to try to solve the problem before engaging support.
3. Work with the training and adoption team to gather direct feedback from users (see Assess user sentiment later in this article), and to check the effectiveness of awareness and adoption activities.

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Measure usage (enablement phase)	Measure and assess Teams usage as sites continue to be onboarded during the enablement phase. Address usage issues as required.	Weekly	
Measure usage	Measure and assess Teams usage in the Drive Value phase (after deployment has been completed). Address usage issues as required.	Biweekly	

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
(drive value phase)			
Update adoption plan	Update your adoption plan based on how measured usage compares to your planning targets.	As needed	

References

About the Microsoft 365 admin center

Activity Reports in the Microsoft 365 admin center

Assess user sentiment

Understanding user sentiment can act as a key indicator for gauging the success of your Teams deployment. User feedback can drive changes in your organization; this might include changes to your communication plans, training programs, or the way that you offer support to your users.

It's important to get feedback early and continue with assessing user sentiment throughout the lifecycle of the project and beyond. Use the following guidance to determine the interval in which your organization will seek out feedback:

- **Beginning of the project**: By assessing user sentiment at the beginning of the project, you can get an early view into how your users feel about their Teams experience.
- **After major milestones**: By collecting feedback throughout the project lifecycle, you can gauge user sentiment on a continuous basis and make changes as needed. This is especially useful after major milestones.
- **Project conclusion**: Assessing user sentiment at the end of a project will tell you how well you've done and where work still needs to be done, and allow you to compare results against the previous survey.
- **Ongoing**: Continue to measure user sentiment indefinitely. Changes in user sentiment might be due to changes in your organization's environment or changes in the Teams service. By gauging user sentiment at regular intervals, you can understand how well your service management teams are performing and how your organization is responding to changes in the Teams service.

User sentiment can be assessed through many different methods. These can include email surveys, in-person or telephone-style interviews, or simply creating a feedback channel in Teams or Yammer. For more information, see Best practices for user feedback methods in Microsoft Teams.

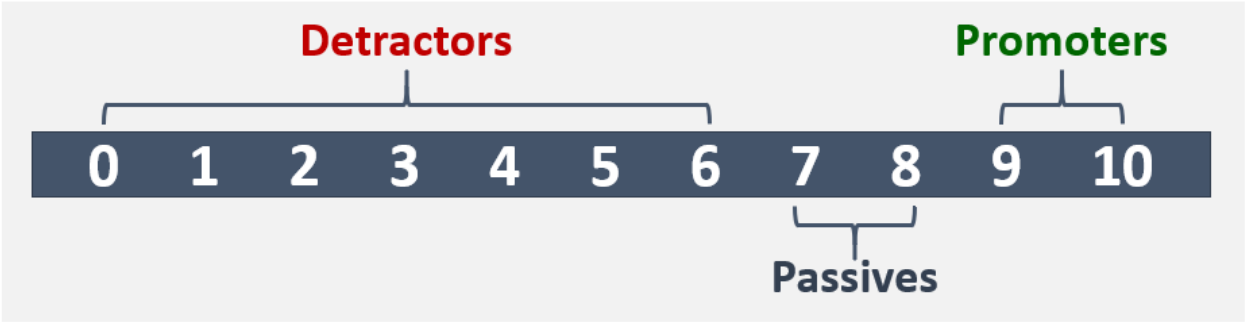
You can also use an industrywide approach to assess user sentiment called net promotor score (NPS), which is described in the following section.

NPS

Net promoter score (NPS) is an industrywide customer loyalty metric and a good approach to use to assess user sentiment. NPS can be calculated by asking two questions: "How likely are you to recommend Teams to a colleague?", followed by the freeform question, "Why?"

NPS is an index ranging from –100 to 100 that measures a customer's willingness to recommend a company's product or service. NPS is based on an anonymous survey that's delivered to users through email or other electronic means. NPS measures the loyalty between a provider and a consumer. It consists of only one question, which asks users to rate their experience from 1 through 10, with the option of providing additional comments. Users are then classified based on the following ratings:

- 9 or 10 are Promoters: Loyal enthusiasts who will promote your service and fuel others.
- 7 or 8 are Passive: Satisfied but unenthusiastic, vulnerable to another service or offering.
- From 1 through 6 are Detractors: Unhappy customers who can damage your service and impede growth.



NPS = % Promotors - % Detractors

Although the base NPS number is useful, you'll get the most value from analyzing user comments. They'll help you understand why the user would (or wouldn't) recommend Teams to others. These comments can provide valuable feedback to help the project or service management teams understand the adjustments necessary to provide a quality service.

To provide NPS surveys to your organization, you can leverage your favorite online survey tool.

Daily/weekly/monthly/as needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Assess user sentiment	Capture and assess user sentiment by using surveys or interviews, or through a feedback channel in Teams or Yammer.	As needed	
Update adoption plans	Drive change in your organization based on user feedback; this can include changes to your communication plans, training programs, or the way that you offer support to your users.	As needed	

References

Net Promoter Score

Using Yammer to collect feedback

Best practices for user feedback

Manage network quality

Many core planning elements go into optimizing, right-sizing, and remediating your network infrastructure to ensure a high-quality, efficient path to the Microsoft Teams service. The planning tasks and requirements are covered in our network readiness guidance. Networks often evolve over time due to upgrades, expansion, or other

business requirements. It's important that you account for your requirements for Teams in your network planning activities.

Although network planning is a critical aspect of a Teams deployment, it's equally important to ensure the network remains healthy and stays current, based on changing business or technical requirements.

To ensure the health of your network, a number of operations activities need to be performed at regular intervals.

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Monitor Microsoft 365 or Office 365 IPs and URLs	Monitor any changes to the Office 365 URLs and IP address ranges by using the provided RSS feed and initiate a change request to applicable networking groups.	Daily	
Update the network based on changes to Microsoft 365 or Office 365 IPs and URLs	Make updates to the applicable network components (firewalls, proxy servers, VPNs, client-side firewalls, and so on) to reflect changes to the Office 365 URLs and IP address ranges.	As needed	
Provide building data	Provide updated subnet information to the quality champion (or relevant stakeholders) to ensure that the building definitions in CQD are kept up to date.	As needed	
Implement change	Implement changes on the network to support changing Teams business and technical requirements. Network elements can include: • Firewalls • VPNs • Wired and Wi-Fi networks • Internet connectivity and ExpressRoute • DNS	As needed	

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Network monitoring and reporting	Monitor the network end to end for availability, utilization, and capacity trends by using your existing third-party network management tools and reporting capabilities available from your network providers. Use trending data for network capacity planning.	Daily, weekly, monthly	
Capacity planning	Collaborate with the Teams service owners to understand changing business and technical requirements that might drive additional capacity changes.	As needed	
Network troubleshooting and remediation	Assist the Teams helpdesks, service owners, and key stakeholders to troubleshoot and remediate issues to related to Teams connectivity, reliability, or quality. Network elements can include: • Firewalls • VPNs • Wired and Wi-Fi networks • Internet connectivity and ExpressRoute • DNS	As needed	
Disaster recovery and high availability testing	Perform regular high availability and disaster recovery testing on the network infrastructure to ensure that it meets the stated service level objectives (SLOs) or service level agreements (SLAs) for the Teams service.	Monthly	

References

Office 365 URLs and IP address ranges

Building data schema

Assess and ensure quality

All organizations need a group or individual to be accountable for quality. This is the most important role in service management. The Quality Champion role is assigned to a person or group who is passionate about their users' experience. This role requires the skills to identify trends in the environment and the sponsorship to work with other teams to drive remediation. The best candidate for the quality champion is typically the customer service

owner. Depending on the organization's size and complexity, this could be any person or group with a passion for ensuring a high-quality user experience.

The quality champion leverages existing tools and documented processes, such as Call Quality Dashboard (CQD) and Improve and monitor call quality for Teams, to monitor user experience, identify quality trends, and drive remediation where needed. The quality champion should work with the respective teams to drive remediation actions and report to a steering committee about progress and any open issues.

Improve and monitor call quality for Teams includes activities that assess and provide remediation guidance in key areas that have the greatest impact on improving user experience. The guidance provided in the Quality Experience Review Guide focuses on using CQD Online as the primary tool to report and investigate each area, with a focus on audio to maximize adoption and impact. Any optimizations made to the network to improve the audio experience will also directly translate to improvements in video and desktop sharing.

We strongly recommend that you nominate the quality champion early on. After being nominated, they should start to familiarize themselves with the content in Improve and monitor call quality for Teams and associated training materials.

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Nominate and train quality champion(s)	Nominate and train a quality champion.	As needed	
Perform Quality of Experience Reviews (QERs)	Perform a QER to identify trends in quality and reliability, review against defined targets, and report out to key stakeholders in the organization.	Monthly (weekly during deployments)	
Drive remediation	Coordinate remediation efforts across the organization based on the QER assessments and findings.	As needed	
Update building data in CQD	Update or add new building definitions in CQD when changes are made to the network (see Upload Building information).	As needed	

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Fill the Quality Champion role	End-to-end responsibility for quality in the organization. This includes: • Ensure that the QER is being conducted regularly. • Report out to key stakeholders on quality status. • Ensure the building data definitions are up to date. • Coordinate remediation efforts across the organization to ensure that users have a high-quality experience with Teams.	Daily	

References

Upload Building information

Improve and monitor call quality for Teams

Manage endpoints

Microsoft Teams endpoints can be defined as any PC, Mac, tablet, or mobile (or any other) device running the Teams client. The term *endpoint* not only encompasses the device itself, but how a user connects to the device—for example, by using the device's built-in mic or speaker, earbuds, or an optimized headset. After they're deployed, endpoints must not be forgotten. The Teams endpoints require ongoing care and maintenance. The following sections describe specific areas to focus on.

Endpoint requirements

One of the key benefits of Teams is that the client is kept up to date automatically. The clients on the PC and Mac are updated by using a background process that checks for new builds and downloads the new client when the app is idle. The Teams mobile apps are kept current through their respective app stores.

The Teams client has minimum requirements in terms of the underlying software platform. These requirements might change over time, and therefore it's important that you monitor them for changes. For example, the Teams client has a minimum iOS version. If the client uses an internet browser, the browser needs to be kept current as well. A list of supported platforms can be found in Get clients for Microsoft Teams.

Endpoint firewalls

Client-side firewalls can have a significant impact on the user experience. Client-side firewalls can affect call quality and even prevent a call from being established. After the appropriate exclusions on the client firewall have been configured, they need to be kept up to date based on the information in Office 365 URLs and IP address ranges. Your third-party vendor will have specific guidance for how to update the exclusions.

Wi-Fi drivers

Wi-Fi drivers might be problematic. As an example, a driver might have very aggressive roaming behaviors between access points that can induce unnecessary access-point switching, leading to poor call quality. A poorly performing Wi-Fi driver might be discovered through a Quality of Experience Review (see Improve and monitor

call quality for Teams for more detail). It's essential to implement a quality-driven process that monitors new Wi-Fi drivers and ensures that they're tested before being deployed to the general user population.

Endpoint management

A catalog of supported endpoints and interface devices (such as headsets) should be available and maintained. This catalog will include a list of approved devices that were selected and validated as part of the Envision and Onboard phases. Typically, specific devices are selected for each persona type in your organization to meet the needs of that persona's attributes. All endpoints have a lifecycle, and you need to manage the vendor contracts, warranty, replacement, distribution, and repair policies associated with these devices.

Endpoint troubleshooting

Even if you've followed the previous guidance, users in your organization still might run into issues with Teams. Although the problem might not be with the endpoint itself, the symptoms of the issue are typically surfaced through the client to the user. The following guidance is intended to provide general steps you can take to resolve the issue; it's not meant to be a comprehensive troubleshooting guide. The steps are provided in a specific order, but they don't have to be followed explicitly and might not be applicable, depending on the nature of the issue.

1. **Validate service health:** The issue a user might be experiencing can be related to an event that negatively affects the Teams service or its dependent services. As a first step, we recommend that you confirm there are no active service issues. Consult How to check Microsoft 365 service health. Remember to check for the status of dependent services (for example, Exchange, SharePoint, OneDrive for Business). Monitoring for service health is discussed in more detail in the previous section, Monitor service health.
2. **Validate client connectivity:** Connectivity issues cause functionality or sign-in issues in Teams. We recommend (especially for new sites or locations) that you validate connectivity to the service. Ensure the following Office 365 URLs and IP address ranges guidance is followed for each site. You can leverage the Microsoft Network Assessment Tool to perform a connectivity test to validate that the media ports have been opened correctly for Teams capabilities. Detailed steps on how to run the connectivity tests are provided in the network readiness guidance.
3. **Check the known issues list:** Consult Teams Troubleshooting to determine whether the user has been negatively affected by one of these issues. Follow the workaround provided (if there is one) to resolve the issue.
4. **Visit the Microsoft Teams community:** The Microsoft Teams community offers dedicated spaces for Teams. The Teams community provides a discussion list, blog posts, and announcements centered around Teams. You can post a question or search previous discussions for solutions to your issue.
5. **Contact Microsoft Support:** You can contact Microsoft Support for issues with Teams online or by phone. For information, see Contact support for business products - Admin Help. For Premier customers, support requests can be initiated by following the guidance at Contact support for Microsoft Teams (Premier customers).

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Endpoint requirements	Ensure that the Teams endpoint continues to meet all the software requirements for Teams listed in Get clients for Microsoft Teams.	Monthly	

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Endpoint firewalls	Maintain the appropriate exclusions on the endpoint firewall based on the information in Office 365 URLs and IP address ranges. Your third-party vendor will have specific guidance for how to maintain the exclusions. Subscribe to the RSS feed to be notified automatically of changes.	As needed	
Wi-Fi drivers	Test and update Wi-Fi drivers on the PC. Validate the results by using CQD (Improve and monitor call quality for Teams).	As needed	
Endpoint management	Maintain the catalog of supported endpoints and interface devices (such as headsets). Manage vendor contracts, warranty, distribution, replacement, and repair policies.	Monthly	
Endpoint troubleshooting	Troubleshooting tasks can include verifying connectivity, consulting the known issues list, log gathering, analysis, and escalation to Microsoft Support or third-party vendors.	As needed	

References

Office 365 URLs and IP address ranges

Get clients for Microsoft Teams

Microsoft Teams community

Teams Troubleshooting

Verify service health for Microsoft Teams

Contact support for business products - Admin Help

Contact Premier support

Troubleshooting Teams video

Manage Teams

After the Microsoft Teams service has been deployed, you'll need to perform several activities relating to its administration. The activities range from administering the service and individual users to capacity planning and provisioning licensing and telephone numbers. The following sections cover some of these common administration tasks.

Service administration

The Teams service has multiple settings that can be configured tenant-wide. Changes made to the tenant settings affect all users who have been enabled for Teams. For a detailed list of these settings, see Manage Microsoft Teams settings for your organization.

User administration

To support users, an organization might require any number of related tasks—the specific tasks vary from one organization to the next. Ultimately, these tasks need to be managed by a support team that has been assigned these operational duties. The following tasks are commonly required to support users in Teams.

General tasks

Manage user access to Microsoft Teams

Team creation (optional)

By default, all users with a mailbox in Exchange Online have permissions to create Microsoft 365 groups and, therefore, a team in Microsoft Teams. If you want to have tighter control and restrict the creation of new teams (and thus the creation of new Microsoft 365 groups), you can delegate group creation and management rights to a set of administrators. If your organization wants to pursue this option, see the process described in this article to allow users to submit requests that are processed by an assigned team.

Daily/weekly/monthly/as-needed tasks

ACTIVITY	DESCRIPTION	CADENCE	TEAM ASSIGNED
Service administration	Administration of tenant-wide Teams settings.	As needed	
User administration	Administration of user-based settings and licensing in Teams.	As needed	
License management	Plan for current and future needs for both user and consumption-based licensing (Calling Plans and Communication Credits) by leveraging the PSTN usage report and PSTN minute pools report.	Weekly	
Telephone number management	Manage the telephone numbers available for future growth, and adjust inventory levels to meet your organizational needs.	Weekly	
Team creation (optional)	Review and process requests for team creation.	As needed	

Get the most out of Teams after upgrading

10/6/2020 • 2 minutes to read • Edit Online



This article is part of the Operational Excellence stage of your upgrade journey, which begins as soon as you've completed your upgrade from Skype for Business to Teams.

This article gives an overview of the requirements for getting the most out of operating Teams after your upgrade. By continuously monitoring Teams service capabilities, you can be sure you're delivering the most value for your organization.

Enhance your service overview

After you've successfully deployed Teams to your organization, and are operating the service with quality and reliability, the next step is to regularly evaluate whether you have any opportunities to enhance your services. This is a part of continuous service improvement planning that is a modern standard for cloud service management.

A great way to make sure you're always getting the most out of your services is to monitor the Teams public roadmaps for new feature enhancements that might be of interest to your organization. If you have access to the Microsoft 365 admin center, you'll receive regular updates from us about new and changing features through our Message Center.

When you do see opportunities to enhance your service, take the time to do it right. Revisit Deploy chat, teams, channels, and apps in Microsoft Teams and our implementation phases and apply the same guidance end to end. When making small, incremental changes, it's unlikely that you'll need to complete all activities and tasks in full, but you should be sure to evaluate each activity and task along the way to give yourself the best chance at a successful outcome.

Decision points	• Decide who will monitor public roadmaps and other service announcements for new features or services that your organization might benefit from. • Decide on the cadence in which to report those new features or services back to the key stakeholders, via your steering committee.
Next steps	• Implement a strategy for staying up to date with your services to get the most value for your organization. • Drive service enhancements through a full project lifecycle to make sure you've properly accounted for the impact they have on your deployment.

Monitor and improve call quality for Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

This article introduces three key tools you can use to monitor, troubleshoot, manage, and improve call quality in Microsoft Teams.

- **Call Quality Dashboard (CQD)**: To analyze org-wide trends or problems, drive improvements to performance
- **Call analytics**: To analyze call and meeting quality for individual users
- **Quality of Service (QoS)**: To prioritize important network traffic

Monitor and troubleshoot call quality

You'll use per-user **Call analytics** and **Call Quality Dashboard** to find and troubleshoot call-quality problems that come up during ongoing operation. This lets you drive performance improvements across your network. Both of these tools are in the Teams admin center.

- **Call analytics** shows detailed information about the devices, networks, and connectivity related to ***specific calls and meetings*** for each user in Teams. Teams admin and helpdesk agents will use this information to troubleshoot call quality and connection problems in a specific call. To learn more, read Set up call analytics and Use Call Analytics to troubleshoot poor call quality.
- **Call Quality Dashboard (CQD)** gives you a ***network-wide view*** of call quality across your organization. Use CQD information to help you identify and fix problems. First, Set up CQD. Then read Manage call and meeting quality in Teams.

Call analytics and CQD run in parallel and can be used independently or together. For example, if a communications support specialist determines that they need more help troubleshooting a user's call problem, they escalate the call to a communications support engineer, who has access to additional information about the call. In turn, the communications support engineer alerts a network engineer to a possible site-related issue they noticed in the call analytics. The network engineer checks CQD to see if an overall site-related issue could be a contributing cause of the user's call problem.

Prioritize important network traffic using QoS

As your users start using Teams for calls and meetings, they may experience a caller's voice breaking up or cutting in and out of a call or meeting. Shared video may freeze or pixelate, or fail altogether. This is due to the IP packets that represent voice and video traffic encountering network congestion and arriving out of sequence or not at all. If this happens (or to prevent it from happening in the first place), use **Quality of Service (QoS)**.

With QoS, you prioritize delay-sensitive network traffic (for example, voice or video streams), allowing it to "cut in line" in front of traffic that is less sensitive (like downloading a new app, where an extra second to download isn't a big deal). QoS identifies and marks all packets in real-time streams using Windows Group Policy Objects and a routing feature called Port-based Access Control Lists, which instructs your network to give voice, video, and screen sharing their own dedicated network bandwidth.

Ideally, you'll implement QoS on your internal network while getting ready to roll out Teams, but you can do it anytime. If you're small enough, you might not need QoS.

When you're ready, read Implement Quality of Service (QoS) in Microsoft Teams.

To use QoS to manage meeting traffic, read Set how you want to handle real-time media traffic for Teams meetings.

Related Topics

Set up call analytics

Use Call Analytics to troubleshoot poor call quality

Set up CQD

Manage call and meeting quality in Teams

Teams Troubleshooting

What is Call Quality Dashboard (CQD)?

8/6/2020 • 2 minutes to read • Edit Online

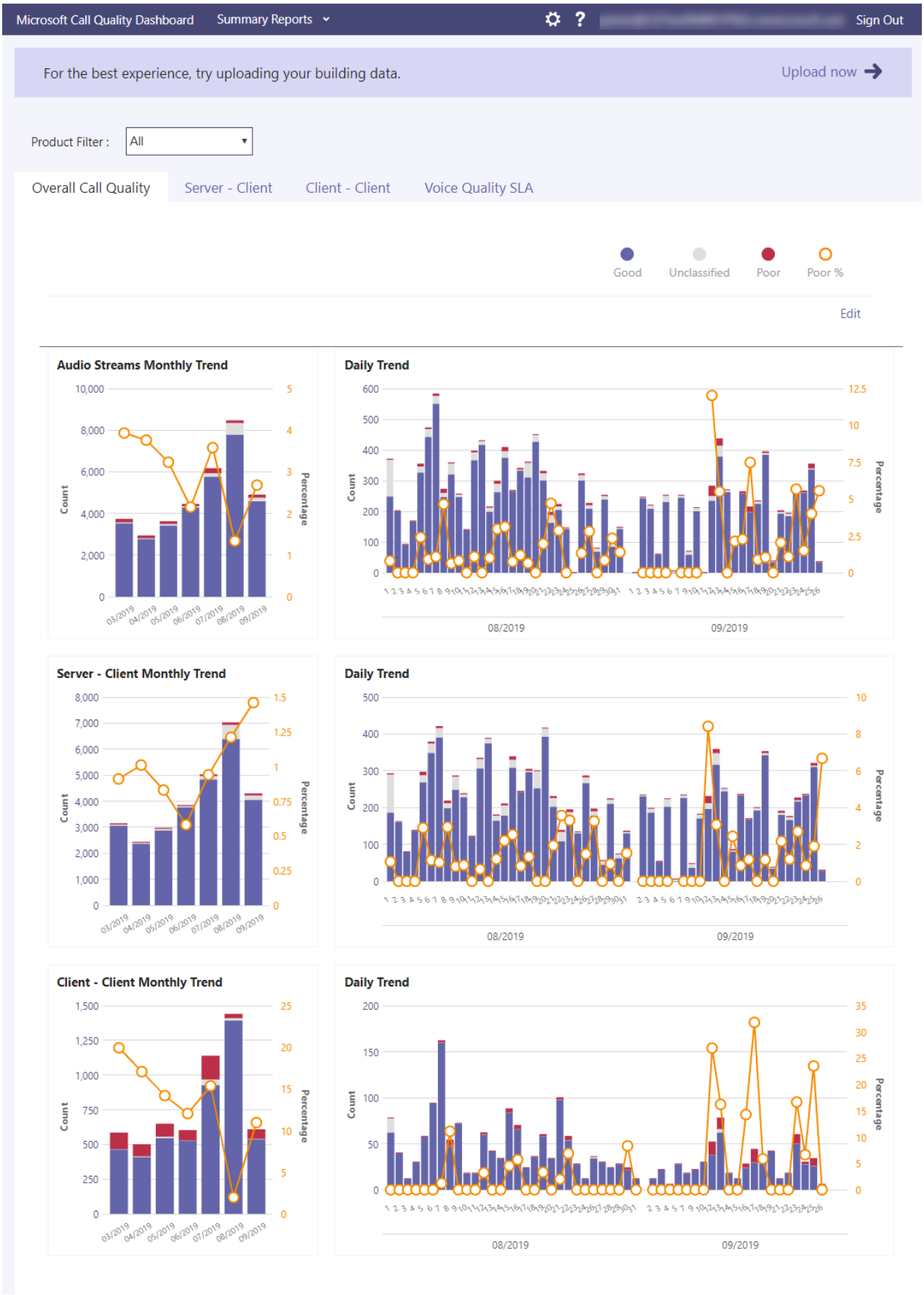
The Microsoft Call Quality Dashboard (CQD) - https://cqd.teams.microsoft.com - shows call and meeting quality, at an **org-wide level**, for Microsoft Teams, Skype for Business Online, and Skype for Business Server 2019.

The latest version of CQD features a near-real-time (NRT) data feed, which means that call records are available in CQD within 30 minutes of the end of a call.

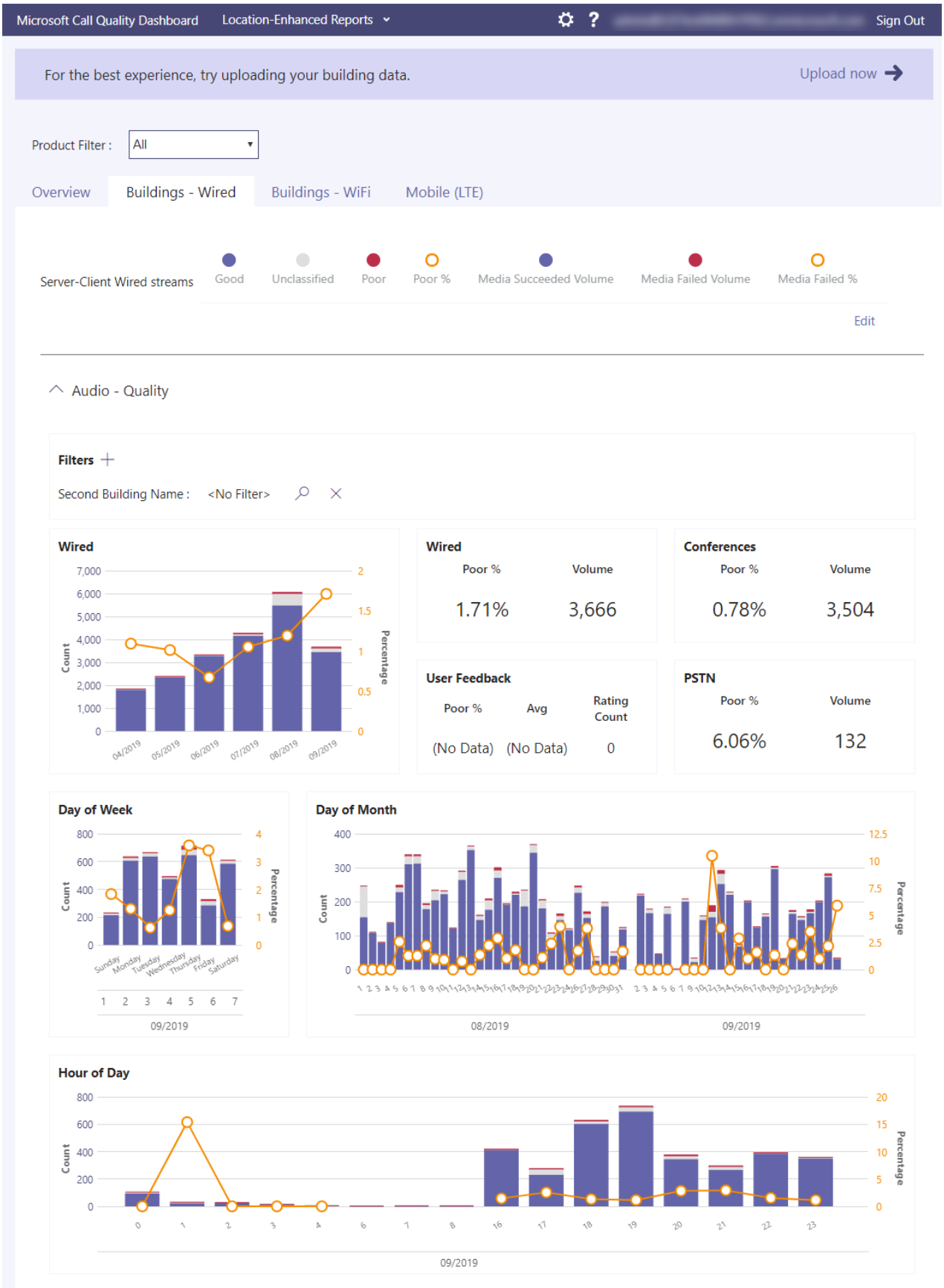
Wherever CQD includes end-user identifiable information (EUII) data, it's managed in the same way as EUII throughout Microsoft 365.

CQD is designed to help Teams admins, Skype for Business admins, and network engineers monitor call and meeting quality at an org-wide level. You'll use CQD to help you **optimize your network** to drive performance quality. When you need to look into call and meeting information for a **specific user**, use CQD data in conjunction with per-user call analytics.

For example, using CQD, you can determine that a user's poor call quality (which you observed using per-user call analytics) is due to a network issue that also affects many other users. CQD captures both the individual call experience and the overall quality of calls made using Teams or Skype for Business. With CQD, overall patterns may become apparent, so network engineers can make informed assessments of call quality. CQD provides reports of call quality metrics that give you insight into overall call quality, server-client streams, client-client streams, and voice quality SLA.



In CQD, we encourage you to upload building and endpoint information, which lets you use Location-Enhanced Reports to analyze call quality and reliability within a user's building. The data can be assessed to determine if the problem is isolated to a single user or affects a larger segment of users. To turn on building or endpoint-specific views in CQD, an admin must upload building or endpoint information on the CQD **Tenant Data Upload** page.



Don't miss our Manage call and meeting quality article, which offers in-depth guidance for the Teams admin or support engineer responsible for managing service quality in Teams.

Older version of CQD (CQD.lync.com)

The current version of CQD (https://CQD.Teams.microsoft.com) is replacing the older version of CQD (https://CQD.lync.com). You can still use CQD.lync.com (available from the Skype for Business admin center), but as of July 1, 2020, it's using the data from CQD.Teams.microsoft.com. We'll turn off access to CQD.lync.com soon, so

you should move to CQD.Teams.microsoft.com if you haven't already done so.

> **IMPORTANT**
>
> As of July 1, 2020, you can no longer view or modify your building or query data from the old CQD (CQD.lync.com). If you haven't already migrated this data from CQD.lync.com and still need it, log a support ticket.

Use Power BI to analyze CQD data

New in January 2020: Download Power BI query templates for CQD. Customizable Power BI templates you can use to analyze and report your CQD data.

Read Use Power BI to analyze CQD data to learn more.

Related topics

Improve and monitor call quality for Teams

Set up Call Quality Dashboard (CQD)

Upload tenant and building data

CQD data and reports

Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Stream Classification in CQD

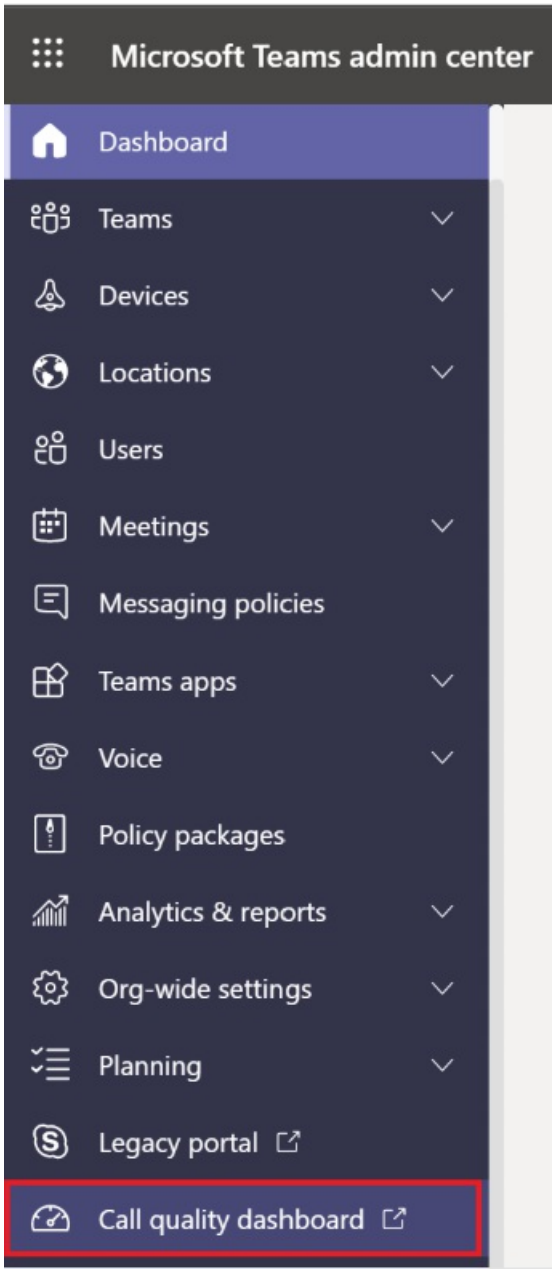
Use Power BI to analyze CQD data

Teams Troubleshooting

Set up Call Quality Dashboard (CQD)

12/5/2020 • 2 minutes to read • Edit Online

Open the Microsoft Call Quality Dashboard (CQD) at https://cqd.teams.microsoft.com (sign in with your admin credentials). Or go to the Teams admin center and select **Call Quality Dashboard**.



On the page that opens, click **Sign in** and enter your Global Administrator account or Microsoft Teams Service Admin account information. After the first time you sign in, CQD will begin collecting and processing data. Keep in mind that it may take one or more hours to process enough data to display meaningful results in the reports.

CQD shows call and meeting quality, at an org-wide level, for Microsoft Teams, Skype for Business Online, and Skype for Business Server 2019.

IMPORTANT

To use CQD with Skype for Business Server 2019, you'll have to Configure Call Data Connector. See Plan Call Data Connector before you start.

Assign admin roles for access to CQD

Assign roles for accessing CQD to the people who need to use it.

If you want non-admin users (such as support engineers and helpdesk agents) to use Call Quality Dashboard, you can assign those users one of the following roles, which gives access to CQD.

	VIEW REPORTS	VIEW EUII FIELDS	CREATE REPORTS	UPLOAD BUILDING DATA
Office 365 Global Administrator	Yes	Yes	Yes	Yes
Teams Service Administrator	Yes	Yes	Yes	Yes
Teams Communications Administrator	Yes	Yes	Yes	Yes
Teams Communications Support Engineer	Yes	Yes	Yes	No
Teams Communications Support Specialist	Yes	No	Yes	No
Skype for Business Administrator	Yes	Yes	Yes	Yes
Azure AD Global Reader	Yes	Yes	Yes	No
Office 365 Reports Reader[1]	Yes	No	Yes	No

[1] In addition to reading CQD reports, the Office 365 Reports Reader can view all the activity reports in the admin center and any reports from the Microsoft 365 Adoption content pack.

NOTE

If you're not seeing EUII (end-user identifiable information) and you have one of the roles that's permitted to see this information, keep in mind that CQD only keeps EUII for 28 days. Anything older than 28 days is deleted.

For more information about these roles, see About Office 365 admin roles.

After the first time you sign in, CQD will begin collecting and processing data. As of December 2019, you can still access the older version of CQD (cqd.lync.com), although the legacy portal gives you a link to the latest CQD (cqd.teams.microsoft.com). Eventually, the older version of CQD will be decommissioned. As of July 1, 2020, the

older version of CQD accesses data from the latest CQD.

Migrate building data and reports from previous version of CQD

> **IMPORTANT**
>
> As of July 1, 2020, you can no longer migrate building data and reports from the old CQD (https://CQD.lync.com).

Use Power BI to analyze CQD data

New in January 2020: Download Power BI query templates for CQD. Customizable Power BI templates you can use to analyze and report your CQD data.

Read Use Power BI to analyze CQD data to learn more.

Related topics

Improve and monitor call quality for Teams

What is CQD?

Upload tenant and building data

CQD data and reports

Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Stream Classification in CQD

Use Power BI to analyze CQD data

Upload tenant and building data in Call Quality Dashboard (CQD)

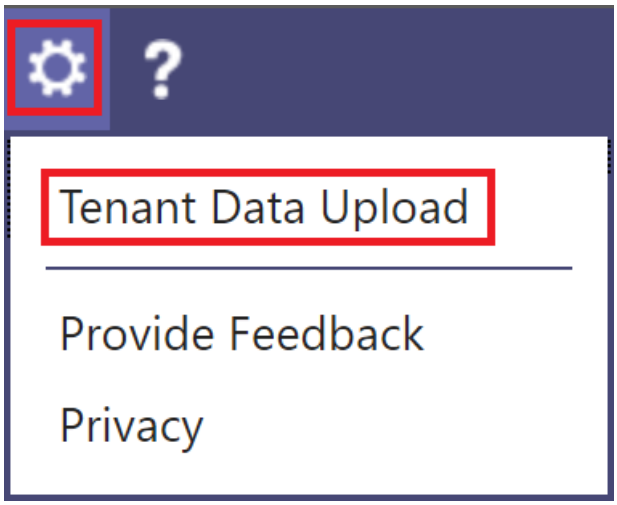
12/5/2020 • 10 minutes to read • Edit Online

To get the most out of Call Quality Dashboard (CQD), we recommend that you upload your tenant and building data. There are 2 types of tenant data files, Building and Endpoint.

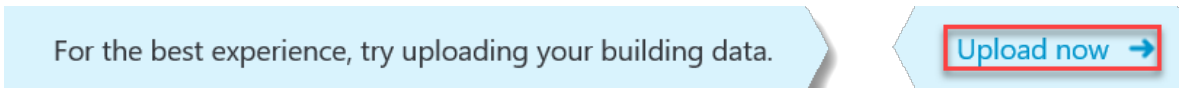
You can download a sample tenant data template here. For help with building mapping, read Create a building map for CQD.

From the CQD Summary Reports dashboard, select **Tenant Data Upload** from the CQD **Settings** menu (a gear icon at the top of CQD). From here, admins can upload their organization's building and endpoint information, such as mapping of IP addresses and geographical information, mapping each wireless access point and its MAC address, etc.

1. Open CQD (from the Teams admin center, or at https://cqd.teams.microsoft.com), then select the gear icon in the upper-right corner and choose **Tenant Data Upload** from the **Summary Reports** page.

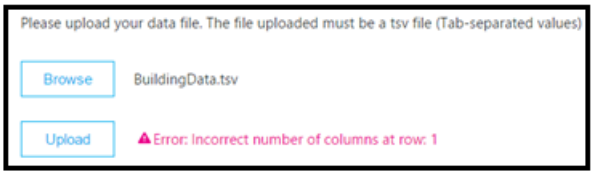


2. Alternatively, if this is your first time visiting CQD, you'll be asked to upload building data. You can select **Upload Now** to quickly navigate to the **Tenant Data Upload** page.



3. On the **Tenant Data Upload** page, select **Browse** to choose a data file.
4. After selecting a data file, specify **Start date** and, optionally, specify an end date.
5. After selecting **Start date**, select **Upload** to upload the file to CQD.

   Before the file is uploaded, it's validated. If validation fails, an error message is displayed requesting that you correct the file. The following figure shows an error occurring when the number of columns in the data file is incorrect.



6. If no errors occur during validation, the file upload will succeed. You can then see the uploaded data file in the **My uploads** table, which shows the full list of all uploaded files for the current tenant at the bottom of that page.

> **NOTE**
> It can take up to four hours to finish processing the building file.
>
> If you've already uploaded a building file and need to add subnets that might have been missed or excluded, modify the original file by adding the new subnets, remove the current file, and re-upload the newly edited file. There can be only one active building data file in CQD.

Upload building data file

The first type of tenant data file in CQD is the **Building** data file. The Subnet column is derived by expanding the Network+NetworkRange column, then joining the Subnet column to the call record's First Subnet or Second Subnet column to show Building, City, Country, or Region information. The format of the data file you upload must meet the following criteria to pass the validation check before upload:

- The file must be either a .tsv file (columns are separated by a TAB) or a .csv file (columns are separated by a comma).
- The data file doesn't include a table header row. The first line of the data file is expected to be real data, not header labels like "Network".
- Data types in the file can only be String, Integer, or Boolean. For the Integer data type, the value must be a numeric value. Boolean values must be either 0 or 1.
- If a column uses the String data type, a data field can be empty but must still be separated by a tab or comma. An empty data field just assigns an empty String value.
- There must be 15 columns for each row, each column must have the appropriate data type, and the columns must be in the order listed in the following table (comma or tab delimited):

Building data file format

COLUMN NAME	DATA TYPE	EXAMPLE	GUIDANCE
NetworkIP	String	192.168.1.0	Required
NetworkName	String	USA/Seattle/SEATTLE-SEA-1	Required[1]
NetworkRange	Number	26	Required
BuildingName	String	SEATTLE-SEA-1	Required[1]
OwnershipType	String	Contoso	Optional

COLUMN NAME	DATA TYPE	EXAMPLE	GUIDANCE
BuildingType	String	IT Termination	Optional
BuildingOfficeType	String	Engineering	Optional
City	String	Seattle	Recommended
ZipCode	String	98001	Recommended
Country	String	US	Recommended
State	String	WA	Recommended
Region	String	MSUS	Recommended
InsideCorp[2]	Bool	1	Required
ExpressRoute[3]	Bool	0	Required
VPN	Bool	0	Optional

[1] While not required by CQD, the templates are configured to display Building and Network name.

[2] This setting can be used to reflect whether or not the subnet is inside the corporate network. You can customize usage for other purposes.

[3] This setting can be used to reflect whether or not the network uses Azure ExpressRoute. You can customize usage for other purposes.

Sample row:

```
192.168.1.0,USA/Seattle/SEATTLE-SEA-1,26,SEATTLE-SEA-1,Contoso,IT
Termination,Engineering,Seattle,98001,US,WA,MSUS,1,0,0
```

IMPORTANT

The network range can be used to represent a supernet (combination of several subnets with a single routing prefix). All new building uploads will be checked for any overlapping ranges. If you have previously uploaded a building file, you should download the current file and re-upload it to identify any overlaps and fix the issue before uploading again. Any overlap in previously uploaded files may result in the wrong mappings of subnets to buildings in the reports. Certain VPN implementations do not accurately report the subnet information.

The VPN column is optional and will default to 0. If the VPN column's value is set to 1, the subnet represented by that row will be fully expanded to match all IP addresses within the subnet. Please use this sparingly and only for VPN subnets since fully expanding these subnets will have a negative impact on query times for queries involving building data.

Supernetting

You can use supernetting, commonly called Classless Inter-Domain Routing (CIDR,) in place of defining each subnet. A *supernet* is a combination of several subnets that share a single routing prefix. Instead of adding an entry for each subnet, you can use the supernetted address. Supernetting is supported, but we don't recommend using it.

For example, Contoso's marketing building is made up of the subnets below:

- 10.1.0.0/24—first floor

- 10.1.1.0/24—second floor
- 10.1.2.0/24—third floor
- 10.1.3.0/24—fourth floor

Instead of adding an entry for each subnet, you can use the supernetted address—in this example, 10.1.0.0/22.

- Network = 10.1.0.0
- Network Range = 22

Here are a few things to consider before you implement supernetting:

- Supernetting can only be used in a subnet mapping with 8-bit to 28-bit mask.
- Supernetting takes less time up front, but it comes at the cost of reducing the richness of your data. Let's say there's a quality problem involving subnet 10.1.2.0. If you implemented supernetting, you won't know where in the building the subnet is located or what type of network it is (for example, a lab). If you'd defined all the subnets for a building and uploaded floor location information, you'd be able to see that distinction.
- It's important to ensure that the supernetted address is correct and isn't catching unwanted subnets.
- It's quite common to find 192.168.0.0 in data. For many organizations, this indicates that the user is at home. For others, this is the IP address scheme for a satellite office. If your organization does have offices that use this configuration, don't include it in your building file because it's difficult to distinguish between home and internal networks by using common subnets.

> **IMPORTANT**
> The network range can be used to represent a supernet. All new building data file uploads will be checked for any overlapping ranges. If you've previously uploaded a building file, you should download the current file and upload it again to identify any overlaps and fix the issue. Any overlap in previously uploaded files might result in the wrong mappings of subnets to buildings in the reports.

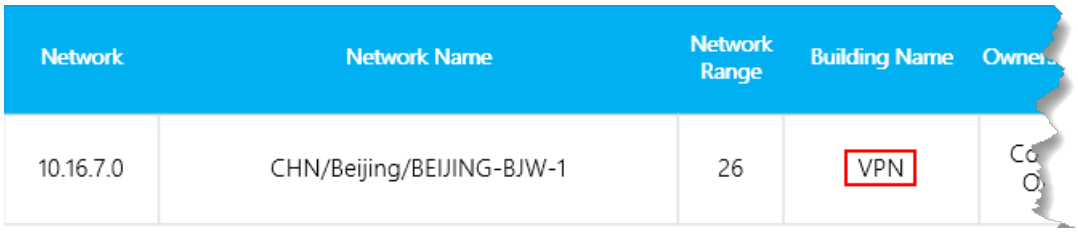
VPN

The quality of experience (QoE) data that clients send to Microsoft 365 or Office 365—which is where CQD data is sourced from—includes a VPN flag. CQD will see this as the First VPN and Second VPN dimensions. However, this flag relies on VPN vendors' reporting to Windows that the VPN network adapter registered is a Remote Access adapter. Not all VPN vendors properly register Remote Access adapters. Because of this, you might not be able to use the built-in VPN query filters. Use the VPN column discussed above to accurately mark and identify VPN subnets. It is also good practice to label your VPN networks for easy identification in your reports. Below are two examples of how to label your VPN subnets:

- Define a **Network Name** by entering "VPN" in this field for VPN subnets.

Network	Network Name	Network Range	Building Name
10.16.7.0	BEIJING-BJW-1\FL2\VPN	26	BEIJING-BJW-

- Define a **Building Name** by entering "VPN" in this field for VPN subnets.



Network	Network Name	Network Range	Building Name	Owner
10.16.7.0	CHN/Beijing/BEIJING-BJW-1	26	VPN	Co O

> **NOTE**
>
> VPN connections have been known to misidentify the network connection type as wired when the underlying connection is wireless. When looking at quality over VPN connections, you can't assume that the connection type has been accurately identified.

Endpoint data file

The other type of CQD tenant data file is the **Endpoint** data file. The column values are used in the call record's First Client Endpoint Name or Second Client Endpoint Name column to show Endpoint Make, Model, or Type information. The format of the data file you upload must meet the following criteria to pass the validation check before upload:

- The file must be either a .tsv file (columns are separated by a TAB) or a .csv file (columns are separated by a comma).
- The content of the data file doesn't include table headers. The first line of the data file is expected to be real data, not a header label like "EndpointName".
- All seven columns use the String data type only. The maximum allowed length is 64 characters.
- A data field can be empty but must still be separated by a tab or comma. An empty data field just assigns an empty String value.
- EndpointName must be unique, otherwise the upload fails. If there is a duplicate row or two rows that use the same EndpointName the conflict will cause incorrect joining.
- EndpointLabel1, EndpointLabel2, and EndpointLabel3 are customizable labels. They can be empty Strings or values such as "IT Department designated 2018 Laptop" or "Asset Tag 5678".
- There must be seven columns for each row and the columns must be in the following order:

  Field order:

  EndpointName, EndpointMake, EndpointModel, EndpointType, EndpointLabel1, EndpointLabel2, EndpointLabel3

  Sample row:

  ```
  1409W3534, Fabrikam, Model 123, Laptop, IT designated 2018 Laptop, Asset Tag 5678, Purchase 2018
  ```

Update a building file

While gathering building and subnet information, administrators will often upload the building file in multiple iterations over time, adding new subnets and their building information as it becomes available. When this occurs, you'll need to re-upload your building file. This process is like the initial upload as described in the previous section, with a few exceptions as noted in the following section.

IMPORTANT

Only one building file can be active at a time. Multiple building files aren't cumulative.

Add net new subnets

There are times when you'll need to add net new subnets to CQD that weren't originally part of your network topology. To add net new subnets, do the following from the **Tenant Data Upload** page in CQD:

1. Download the original file, if you don't already have an up-to-date copy.
2. Remove the current file in CQD.
3. Edit the original building file and provide an end date that occurs at least one day before the net new subnets were acquired.
4. Append the net new subnets to the original building file.
5. Upload the newly modified building file, and set the start date for one day after the previous building file ends.

Add missing subnets

After you upload building information for managed networks, every managed network should have a building association. However, this won't always be the case; typically, a few subnets are missed. To find these missing networks, review the **Missing Subnet Report** on the **Quality of Experience Reports** page in CQD. This presents all the subnets with 10 or more audio streams that aren't defined in the building data file and are being marked as outside. Ensure that there are no managed networks in this list. If subnets are missing, use the following procedure to update the original building data file and re-upload it to CQD.

1. Go to the **Tenant Data Upload** page in CQD.
2. Download the original file, if you don't already have an up-to-date copy.
3. Remove the current file in CQD.
4. Append the new subnets to the original file.
5. Upload the building file. Be sure to set the start date to at least eight months prior so that CQD will process historical data.

IMPORTANT

You'll need to add your tenant ID as a query filter for **Second Tenant ID** to this report to filter the report to view only your organization's tenant data. Otherwise, the report will show federated subnets.

NOTE

Be sure to adjust the Month Year report filter to the current month. Select **Edit**, and adjust the **Month Year** report filter to save the new default month.

Related topics

Create a building map for CQD

Improve and monitor call quality for Teams

What is CQD?

Set up Call Quality Dashboard (CQD)

CQD data and reports

Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Stream Classification in CQD

Use Power BI to analyze CQD data

Data and reports in Call Quality Dashboard (CQD)

8/25/2020 • 17 minutes to read • Edit Online

Microsoft Call Quality Dashboard (CQD) uses a near-real-time (NRT) data feed. Call records are available in CQD within 30 minutes of the end of a call. Call records from the NRT pipeline are only available for a few months before they are removed from the data set.

Many ways to access CQD data

You can access CQD data by several different avenues. Pick the one that best meets your needs:

Teams admin center (https://admin.teams.microsoft.com)	CQD data is included on the **Users** page in the Teams admin center, showing the most common data you need in an easy-to-read format. You can't customize CQD data that you find under **Users**.
CQD portal (https://cqd.teams.microsoft.com)	Robust summary and detailed reports that meet most needs, with drill-through filtering. You can also customize reports in the CQD portal. Get two CQD report templates to help you analyze data in the CQD portal.
Power BI	Use direct queries to view your CQD data in Power BI using customizable Power BI templates. Download Power BI query templates for CQD. You can also use the REST API to access CQD data through Power BI. Use this method if you want to download your CQD data so you can work on it offline. The benefit of using this method is better performance, especially useful for large data sets that bog down in Power BI when you're online.
Graph API	Access call quality data yourself using the Graph API. This is the most complex method, but it gives you the most control and flexibility in analyzing your call quality data. For example, if you need to join it with other data for your organization, you can use the Graph API to create a data model and incorporate call quality data.

Import the CQD report templates

Download two curated CQD report templates (All Networks and Managed Networks) to help you get up to speed quickly with CQD. The All Networks template, though optimized to work with a building data file, can be used while you work toward collecting and uploading building information into CQD, as described in the next section.

To import the templates (.CQDX) into CQD

1. In CQD, select **Detailed Reports** from the menu at the top of the page.
2. In the left panel, select **Import**. Browse to the first CQDX template and select **Open**.
3. After the template is uploaded, a pop-up window will display the message "Report import was successful."

4. Repeat steps 2 and 3 for the second CQD template.

> **NOTE**
> Each user must import the CQD templates into their CQD instance.

EUII data

For compliance reasons, end-user identifiable information (EUII) data (also known as personally-identifiable information or PII) is only kept for 28 days. As NRT data crosses the 28-day mark, fields that contain EUII are cleared, resulting in EUII-free NRT data. Fields that contain EUII data are:

- Full IP address
- Media Access Control (MAC) Address
- Basic Service Set identifier (BSSID)
- Session Initiation Protocol (SIP) URI (Skype for Business only)
- User Principal Name (UPN)
- Machine Endpoint Name
- User Verbatim Feedback
- Object ID (the Active Directory object ID of the endpoint's user)

Admin roles with and without EUII access

These RBAC roles **DO** have EUII access:

- Global Admin
- Teams Service Admin
- Teams Communications Admin
- Teams Communications Support Engineer
- Global Reader
- Skype for Business Admin

These RBAC roles **DON'T** have EUII access:

- Reports Reader
- Teams Communications Support Specialist

Date controls

CQD supports the following Rolling Trend types:

- 5-day
- 7-day
- 30-day
- 60-day
- 90-day

The URL Date parameter accepts a Day field. Rolling-day reports use dates specified in the YYYY-MM-DD format as the last day of the trend. The URL Date parameter “00” indicates “today”.

URL	END DATE OF ROLLING DAY TREND
https:///spd/#/Dashboard//2019-02/	Current Day of Feb 2019

URL	END DATE OF ROLLING DAY TREND
https:///spd/#/Dashboard//2019-02-15/	Feb 15, 2019
https:///spd/#/Dashboard//00/	Current Day

By default, the current day of the month is used as the last day of the Rolling Day Trend.

Data available in CQD reports

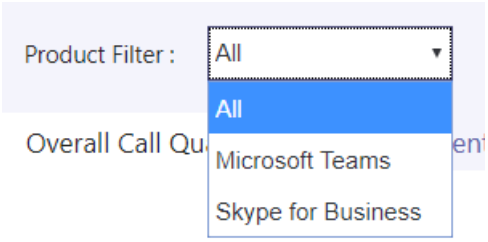
The default summary and detailed CQD reports may be all you need to manage call quality for your org. If you need to, you can create custom reports.

If you want to use Power BI to analyze your CQD data, read Use Power BI to analyze CQD data for Teams.

FEATURE	SUMMARY REPORTS	DETAILED REPORTS
Application sharing metric	No	Yes
Customer building information support	Yes	Yes
Customer endpoint information support	Only in cqd.teams.microsoft.com	Only in cqd.teams.microsoft.com
Drill down analysis support	No	Yes
Media reliability metrics	No	Yes
Out-of-the-box reports	Yes	Yes
Overview reports	Yes	Yes
Per-user report set	No	Yes
Report set customization (add, delete, modify reports)	No	Yes
Video-based screen sharing metrics	No	Yes
Video metrics	No	Yes
Amount of data available	Last 12 months	Last 12 months
Microsoft Teams data	Yes	Yes

Select product data to see in reports

In the Summary and Location-Enhanced Reports, you can use the **Product Filter** drop-down to show all product data, only Microsoft Teams data, or only Skype for Business Online data.



In Detailed reports, you can use the **Is Teams** dimension to filter the data to Microsoft Teams or Skype for Business Online data.

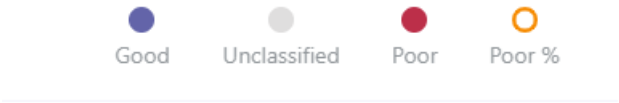
Summary Reports

These are the reports that you'll see on the CQD Dashboard when you first sign in to CQD. They give you an at-a-glance look at quality trends with daily, monthly, and table reports to assist with identifying subnets that have poor quality.

TAB	DESCRIPTION
Overall Call Quality	Aggregate of the other 3 tabs.
Server—Client	Details of the streams between server and client endpoints.
Client—Client	Details of the streams between two client endpoints.
Voice Quality SLA	Info about calls included in the Skype for Business voice quality SLA.

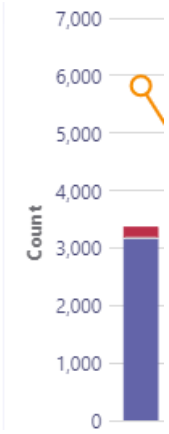
Overall Call Quality tab

Use the data on this tab to evaluate call quality status and trends based on stream counts and poor percentages. The legend in the upper-right corner shows which color and visual elements represent these metrics.

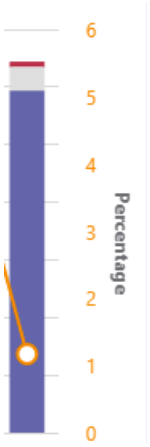


Streams are classified in three groups: Good, Poor, and Unclassified. There are also calculated *Poor %* values that give you the ratio of streams classified as *Poor* to the total classified stream count. Since *Poor % = Poor streams/ (Poor streams+ Good streams) * 100*, the *Poor %* is unaffected by the presence of multiple *Unclassified* streams. To see what classifies a stream as poor or good, refer to Stream Classification in Call Quality Dashboard.

Use the scale on the left to measure the stream count values.

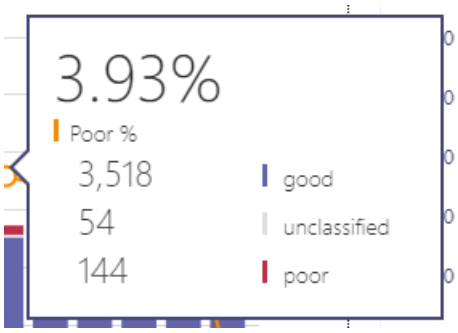


Use the scale on the right to measure the Poor % values.



You can also obtain the actual numerical values by hovering the mouse over a bar.

> **NOTE**
>
> The following example is from a very small sample data set, and the values aren't realistic for an actual deployment.



The overall stream volume helps determine how relevant the calculated Poor percentages are. The smaller the volume of overall streams, the less reliable the reported Poor percentage values are.

Server-Client tab and Client-Client tabs

These two tabs provide details for the streams that took place in their endpoint-to-endpoint scenarios. The Server-Client tab has four collapsible sections that represent four scenarios under which media streams would flow.

- Wired Inside
- Wired Outside
- WiFi Inside
- WiFi Outside

Similarly, the Client-Client tab has five collapsible sections:

- Wired Inside — Wired Inside
- Wired Inside — Wired Outside
- Wired Outside — Wired Outside
- Wired Inside — WiFi Inside
- Wired Inside — WiFi Outside

Inside versus Outside

CQD classifies a stream as *Inside* or *Outside* using Building information, if it exists. Endpoints of each stream are associated with a subnet address. If the subnet is in the list of the subnets marked InsideCorp in the uploaded Building information, then it is considered *Inside*. If Building information has not yet been uploaded, then Inside Test always classifies the streams as *Outside*.

The Inside Test for a Server-Client scenario only considers the client endpoint. Because servers are always outside from a user's perspective, this isn't accounted for in the test.

Wired versus WiFi

As the names indicate, the classification criteria is based on the type of client connections. Server is always wired and it isn't included in the calculation. In a given stream, if one of the two endpoints is connected to a WiFi network, then CQD classifies it as WiFi.

> **NOTE**
> Given a stream, if one of the two endpoints is connected to a WiFi network, then it is classified as WiFi in CQD.

Tenant Data information

The CQD Summary Reports dashboard includes a **Tenant Data Upload** page, accessed by selecting **Tenant Data Upload** from the settings menu in the top-right corner. This page is used for admins to upload their own information, such as:

- A map of IP address and geographical information.
- A map of each wireless AP and its MAC address.
- A map of Endpoint to Endpoint Make/Model/Type, etc.

We recommend that you upload your tenant, building, and location data so CQD can include this information in your reports. If you haven't already uploaded this data, read Upload tenant and building data.

Detailed reports

NAME	DESCRIPTION
Location-Enhanced Reports	Shows quality trends based on location information. This report appears only if you've uploaded your tenant data.
Reliability Reports	Includes audio, video, video-based screen sharing (VBSS), and app sharing reports.
Quality of Experience Reports	Audio quality and reliability for all clients and devices, including meeting rooms. These reports are a "slimmed-down" version of the downloadable CQD templates, focusing on key areas for analyzing audio quality and reliability.

NAME	DESCRIPTION
Quality Drill Down Reports	Drill downs: Date by region, locations, subnets, hour, and users.
Failure Drill Down Reports	Drill downs: Date by region, locations, subnets, hour, and users.
Rate My Call Reports	Analyze user call ratings by region, location, or by user. Includes verbatim feedback.
Help Desk Reports	Help Desk Reports look at call and meeting data for individual users, groups of users, or everyone. Incorporating building and EUII data, these reports help identify possible system issues based on network location, conference details, devices, or firmware.
Client Version Reports	Client Version Summary: View the Sessions and Users counts for each client app version Client Version by User: View user names for each client app version Pre-built filters for Product and Client Type help focus the versions to specific clients.
Endpoint Reports	Shows call quality by machine endpoints (computer make and model). These reports include building data, if you've uploaded it.

Create custom detailed reports

If the default CQD reports don't meet your needs, use these instructions to create a custom report. Or (as of January 2020) Use Power BI for CQD reports instead.

From the pull-down list of reports at the top of the screen displayed at login (the **Summary Reports** screen) Select **Detailed Reports** and then **New**. Click **Edit** in a report to see the Query Editor. Each report is backed by a query into the cube. A report is a visualization of the data returned by its query. The Query Editor helps you edit these queries and the display options of the report.

> **IMPORTANT**
>
> The network range can be used to represent a supernet (combination of several subnets with a single routing prefix). All new building uploads will be checked for any overlapping ranges. If you have previously uploaded a building file, you should download the current file and re-upload it to identify any overlaps and fix the issue before uploading again. Any overlap in previously uploaded files may result in the wrong mappings of subnets to buildings in the reports. Certain VPN implementations do not accurately report the subnet information. It is recommended that when adding a VPN subnet to the building file, instead of one entry for the subnet, separate entries are added for each address in the VPN subnet as a separate 32-bit network. Each row can have the same building metadata. For example, instead of one row for 172.16.18.0/24, you should have 256 rows, with one row for each address between 172.16.18.0/32 and 172.16.18.255/32, inclusive.
>
> The VPN column is optional and will default to 0. If the VPN column's value is set to 1, the subnet represented by that row will be fully expanded to match all IP addresses within the subnet. Please use this sparingly and only for VPN subnets since fully expanding these subnets will have a negative impact on query times for queries involving building data.

Point to bar charts and trend lines in the report to display detailed values. The report that has focus will show the action menu: **Edit**, **Clone**, **Delete**, **Download**, and **Export Report Tree**.

Query filters

Query filters are implemented by using the Query Editor in CQD. These filters are used to reduce the number of records returned by CQD, thus minimizing the report's overall size and query times. This is especially useful for filtering out unmanaged networks. The filters listed in the following table use regular expressions (RegEx).

FILTER	DESCRIPTION	CQD QUERY FILTER EXAMPLE
No blank values	Some filters don't have the option to filter for blank values. To filter blank values manually, use the blank expression and set the filter to Equals or Not Equals, depending on your needs.	Second Building Name <> ^\s*$
Exclude common subnets	Without a valid building file to separate managed from unmanaged networks, home networks will be included in the reports. These home subnets are outside the scope of IT's control and can be quickly excluded from a report. Common subnets, as defined in this guide, are 10.0.0.0, 192.168.1.0 and 192.168.0.0.	Second Subnet <> 10.0.0.0 | 192.168.0.0 | 192.168.1.0
View inside only	Used to filter a report for managed (inside) or unmanaged (outside). The managed CQD template is already preconfigured with these filters.	Second Inside Corp = Inside

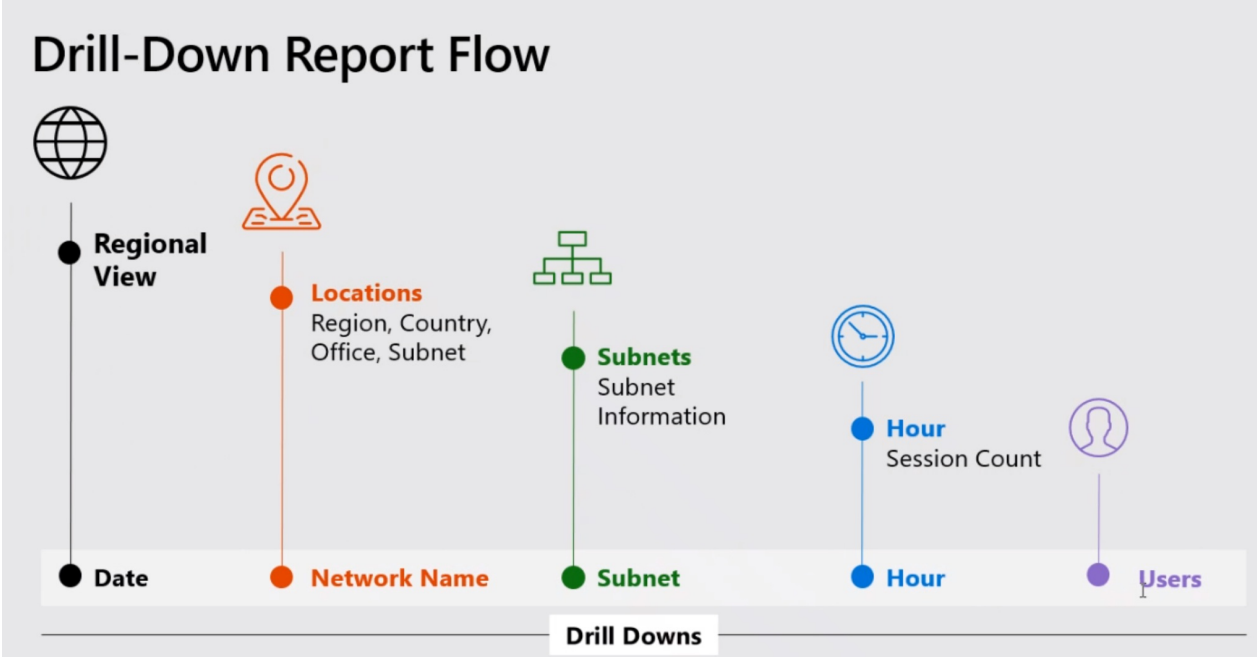
Report filters

Use CQD report filters to narrow the focus of your investigations. Use report filters by adding a filter to the rendered report either in the Query Editor or directly in the report. The following report filters are used throughout the CQD templates.

FILTER	DESCRIPTION	CQD REPORT FILTER EXAMPLE
Month	Start with the year first, then month.	2017-10
Alphabetic	Filters for any alphabetic characters.	[a-z]
Numeric	Filters for any numeric characters.	[0-9]
Percentage	Filters for a percentage.	([3-9]\.)|([3-9])|([1-9][0-9])

Drill-down filters

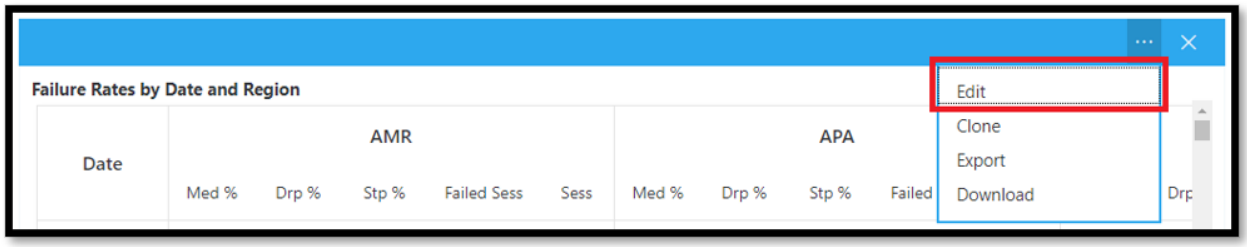
CQD reports feature several drill-down filters, which are powerful tools for narrowing the focus of your call-quality investigations. If you select a drill-down field, the report automatically opens the appropriate tab and filters on the selected value. If that tab has its own drill-down fields and one is selected, both sets of filters are applied, progressively narrowing the resulting data set.



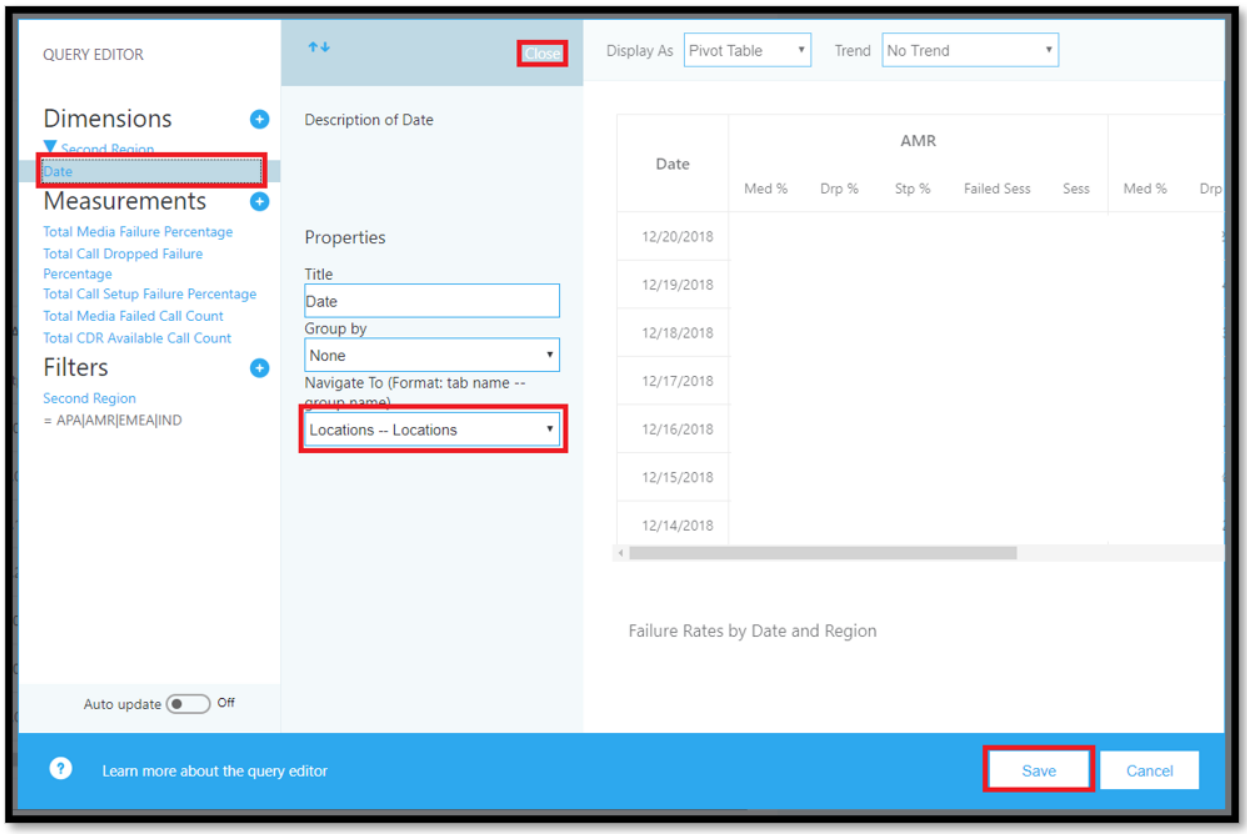
Adding and editing drill-down fields

When editing a report, you have the option to specify drill-down fields of your own using the Query Editor.

Start by clicking ... for the report you want to edit, then select **Edit**.



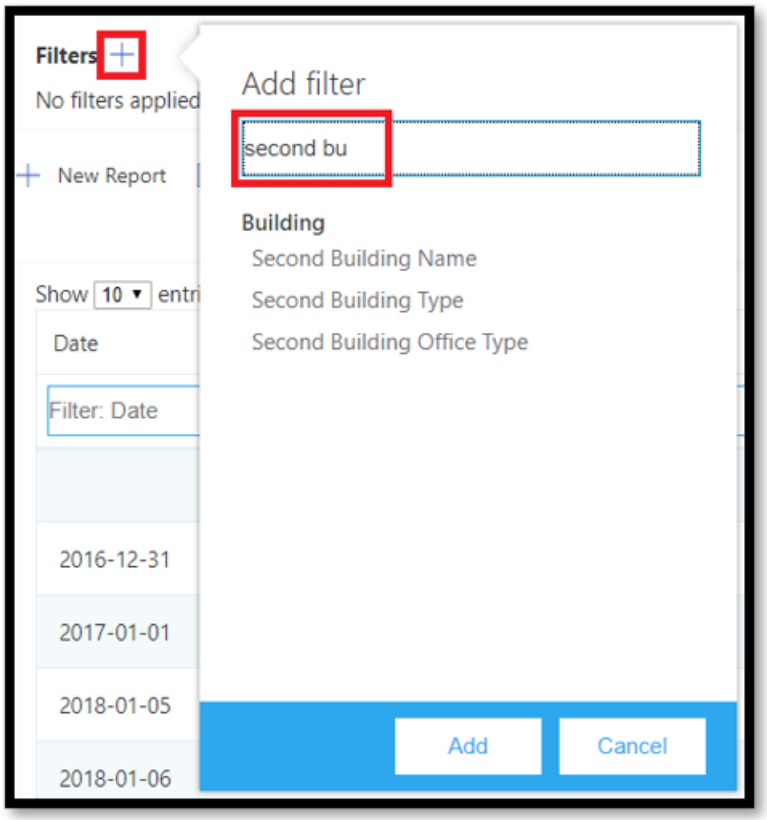
Select a Dimension from the list on the left side of the Query Editor. Then click on the dropdown below the **Navigate To** label and select the tab and expander group that you want that Dimension to drill through to. Note: Presently, drill-down functionality only works by navigating to different tabs. Support for drilling through to a specific expander will be added later. Finally, click **Close** to save your changes to the Dimension, then click **Save** to save and close the Query Editor.



Multi-select filters

In addition to drill-down functionality, CQD also supports specifying Filters with multiple values (OR filters).

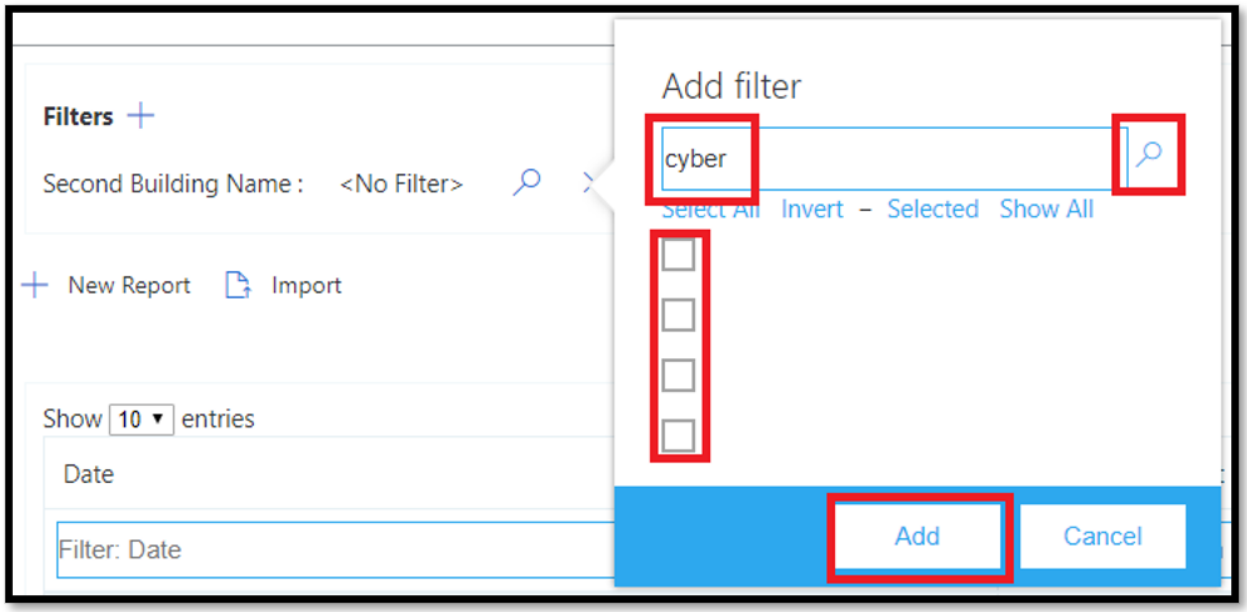
In order to select multiple filter values, begin by adding a new filter to the report. Click **+** beside the **Filters** label, enter the name of the Dimension you want to use, and click **Add**.



Then, click **Search** (a magnifying glass icon next to the new filter). You'll see a text field, and a number of options, including **Select All** and **Invert**. Enter a value, and click **Search** next to that field to search. Alternatively, leave the text field empty and click **Search** to view up to the first 100 options.

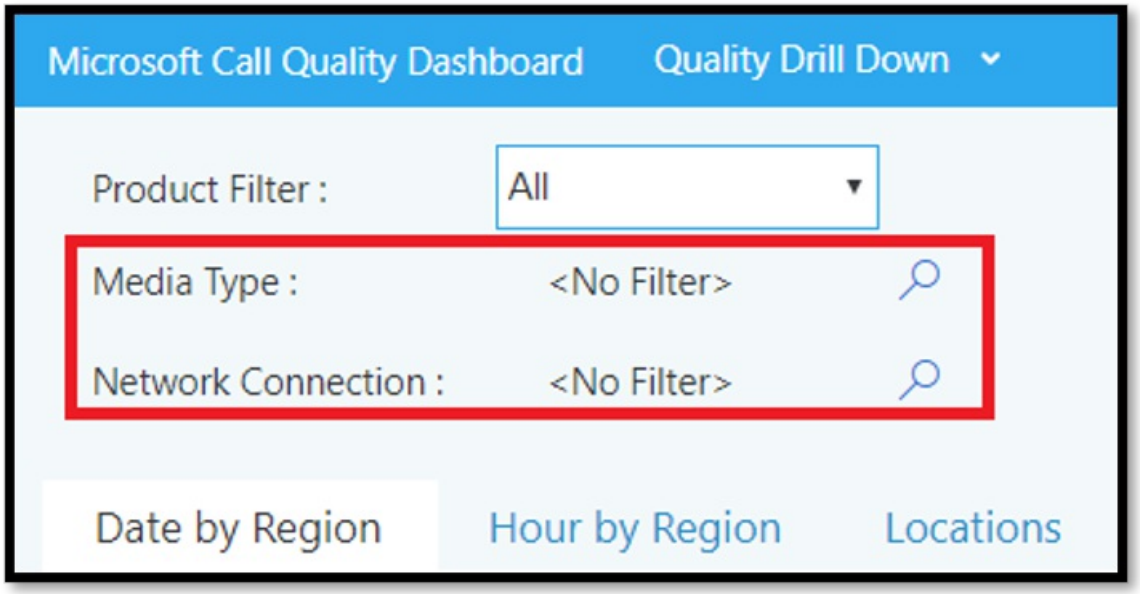
```
/filter/[AllStreams].[Second Tenant Id]\|[YOUR TENANT ID HERE]
```

Example:



Dashboard level filters

Certain CQD reports have dashboard-level filters added to them, making it easy to filter by common parameters. These filters appear outside the regular report tabs and directly beneath the Product filter, and they apply to all filters in the Dashboard.




```
/filter/[AllStreams].[Is Teams]|[TRUE | FALSE]
```

URL filters

CQD supports adding filters to the URL. This makes it easy to share or bookmark a CQD query. You can define parameters in the URL, such as Trending Month, tenant ID, or language. You can also add Product or Dashboard level filters to the URL. Excluding federated data from CQD reports is useful when you're remediating managed buildings or networks where federated endpoints might influence your reports.

To add a filter, append the following to the end of the URL:

```
/filter/[AllStreams].[Second Tenant Id]\|[YOUR TENANT ID HERE]
```

Example:

```
https://cqd.teams.microsoft.com/cqd/#/1234567/2018-08/filter/[AllStreams].[Second Tenant Id]|[TENANTID]
```

To add a Dashboard-level filter to a URL, that filter must exist in CQD as either a Product or Dashboard level filter. Add these filters to the URL after the Trending Month and before the URL parameters:

```
filter/DATA_MODEL_NAME|VALUE
```

For example, to apply a Product filter value of Microsoft Teams, you'd add the following:

```
filter/[AllStreams].[Is%20Teams]|[True]
```

Your entire URL would look something like this:

```
https://cqd.teams.microsoft.com/spd/#/Dashboard/2624085/2018-9/filter/[AllStreams].[Is%20Teams]|[True]
```

To apply URL filters with multi-select values, separate each value with a pipe (|) character. For example:

```
filter/[AllStreams].[Media%20Type]|[Video]|[Audio]|[VBSS]
```

If you specify an invalid name or value, the URL filter won't be applied.

You can use a URL filter to filter every report for a specific dimension. The most common URL filters are used to filter reports to exclude federated participant telemetry, or focus on only Teams or Skype for Business Online. Excluding federated data from CQD reports is useful when you're remediating managed buildings or networks where federated endpoints might influence your reports.

FILTER	DESCRIPTION	CQD QUERY FILTER EXAMPLE
No blank values	Some filters don't have the option to filter for blank values. To filter blank values manually, use the blank expression and set the filter to Equals or Not Equals, depending on your needs.	Second Building Name <> ^\s*$
Exclude common subnets	Without a valid building file to separate managed from unmanaged networks, home networks will be included in the reports. These home subnets are outside the scope of IT's control and can be quickly excluded from a report. Common subnets, as defined in this article, are 10.0.0.0, 192.168.1.0 and 192.168.0.0.	Second Subnet <> 10.0.0.0 | 192.168.0.0 | 192.168.1.0
View inside only	Used to filter a report for managed (inside) or unmanaged (outside). The managed CQD template is already preconfigured with these filters.	Second Inside Corp = Inside

How to find your tenant ID

The tenant ID in CQD corresponds to the Directory ID in Azure. If you don't know your Directory ID, you can find it in the Azure portal:

1. Sign in to the Microsoft Azure portal: https://portal.azure.com

2. Select **Azure Active Directory**.
3. Under **Manage**, select **Properties**. Your tenant ID is in the **Directory ID** box.

You can also find your tenant ID by using PowerShell:

```
Login-AzureRmAccount
```

Comparing Teams and Skype for Business CQD data

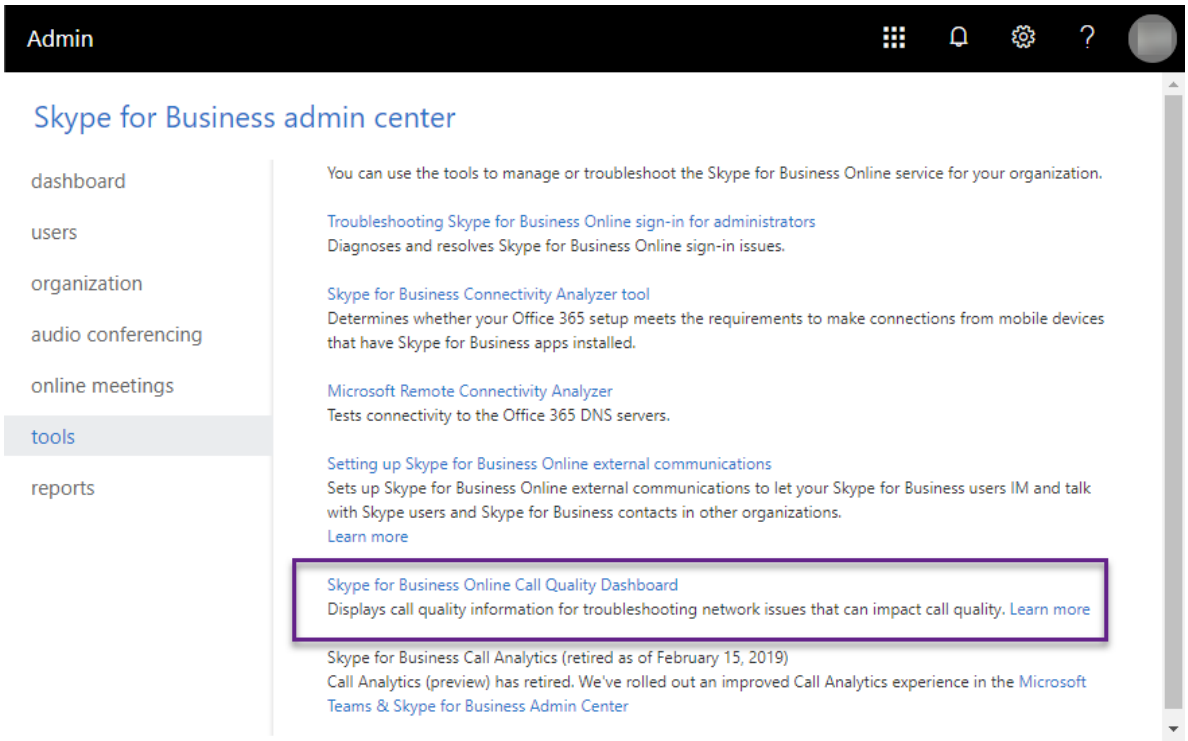
Even within the latest CQD (cqd.teams.microsoft.com), you'll see differences in data between Teams and Skype for Business. Some reasons:

- Differences in the mechanisms for ensuring performance and reliability:
  - Teams has auto-reconnect and fast roaming. Skype for Business doesn't.
  - Teams has dynamic bandwidth management. Skype for Business doesn't.
- Differences in IP address ranges between Teams and Skype for Business. The Teams IP ranges are newer, which could cause connectivity problems at the firewall.

Open CQD from the Skype for Business legacy portal

Using the Skype for Business legacy portal

1. Sign in to your Office 365 organization using an admin account, and then select the **Admin** tile to open the Admin center.
2. In the left pane, under **Admin centers**, select **Microsoft Teams** to open the Teams admin center.
3. In the Teams admin center, select **Legacy Portal** in the left pane, select **Tools**, and then select **Skype for Business Online Call Quality Dashboard**.



4. On the page that opens, sign in with your Global Administrator account, and then provide the credentials for the account when prompted.

After the first time you sign in, CQD will begin collecting and processing data.

> **IMPORTANT**
>
> As of December 2019, you can still access the older version of CQD (cqd.lync.com), although the legacy portal gives you a link to the latest CQD (cqd.teams.microsoft.com). Eventually, the older version of CQD will be decommissioned. As of July 1, 2020, the older version of CQD accesses data from the new CQD (https://CQD.teams.microsoft.com), and you can no longer export building and report data. Sometime in late 2020, we'll turn off the old CQD and you'll no longer be able to access it.

Related topics

Improve and monitor call quality for Teams

What is CQD?

Set up Call Quality Dashboard (CQD)

Upload tenant and building data

Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Stream Classification in CQD

Use Power BI to analyze CQD data

Use CQD to manage call and meeting quality in Microsoft Teams

8/6/2020 • 47 minutes to read • Edit Online

This article will help you - the Teams admin or support and helpdesk engineer - to develop a process for monitoring and maintaining call and meeting quality for your organization by using Microsoft Teams Call Quality Dashboard (CQD). Our guidance emphasizes audio-quality scenarios because any network improvements you make to improve the audio experience will translate to improvements in video and sharing.

Key to this guidance are the two curated CQD templates - we recommend that you download them before you go through the guidance in this article.

This article assumes that you've already set up CQD.

Categories to monitor and maintain

Once you've rolled out meetings and voice in Teams, you'll need a plan for ongoing monitoring and maintenance. Doing so will ensure that Teams is always running optimally. This plan should include the key areas listed below. You should also establish targets for quality metrics and a plan for troubleshooting and isolating problems when they happen.

CATEGORY	DESCRIPTION
Call quality	Break down the metrics by internal calls (within your organization, such as VPN, WiFi, wired) or external calls Break down the metrics by building or network VPN calls Calls using TCP, UDP, or proxy
Call reliability	Identify and remediate any network or firewall problems Gain insights into the percentages of call setup and drop failures Learn where the majority of call setup and drop failures occur
User survey	Use Rate My Call data to learn about users' actual experience Where are the poor experiences occurring? Correlate the poor experience with call quality, reliability, and devices
Devices	Learn which microphones and speakers are most commonly used and their impact on call quality Are the supporting audio, video, USB, and WiFi drivers being regularly patched?

CATEGORY	DESCRIPTION
Clients	Learn which client types and versions are being used and their impact on call quality and reliability

By continually assessing and remediating the areas described in this article, you can reduce their potential to negatively affect your users. Most user problems can be grouped into the following categories:

- Incomplete firewall or proxy configuration
- Poor Wi-Fi coverage
- Insufficient bandwidth
- VPN
- Inconsistent or outdated client versions and drivers
- Unoptimized or built-in audio devices
- Problematic subnets or network devices

Through proper planning and design before deploying Teams or Skype for Business Online, you can reduce the amount of effort that will be required to maintain high-quality experiences.

This article focuses on using the Call Quality Dashboard (CQD) Online as the primary tool to report and investigate each area, with a special emphasis on audio to maximize adoption and impact. Any improvements made to the network to improve the audio experience will also directly translate to improvements in video and desktop sharing.

To accelerate your assessment, two curated CQD templates are provided: one is for managing all networks and the other is filtered for managed (internal) networks only. Although the All Networks template reports are configured to display building and network information, they can still be used while you work toward collecting and uploading building information. Uploading building information into CQD enables the service to enhance reporting by adding custom building, network, and location information while differentiating internal from external subnets. For more information, read Building mapping.

Intended audience

This article is intended to be used by partner and customer stakeholders with roles such as Collaboration Lead/Architect, Consultant, Change Management/Adoption Specialist, Support/Help Desk Lead, Network Lead, Desktop Lead, and IT Admin.

This article is also intended to be used by the designated quality champion(s). For more information, see the Quality Champion role.

What is quality?

In this context, quality is a combination of service metrics and user experience.

Service metrics

Service metrics consist of specific client-based metrics. During each call, the client collects telemetry for the call and submits a report at the end of each call that can later be accessed in CQD or in per-user call analytics. These metrics include (but aren't limited to):

- Poor Stream (incoming and outgoing)
- Setup Failure Rate
- Drop Failure Rate

Poor stream rate

The poor stream rate (PSR) represents the organization's overall percentage of streams that have poor quality.

This metric is meant to highlight areas where your organization can concentrate effort to have the strongest impact toward reducing this value and improving the user experience, which is why managed networks are the primary focus when looking at PSR. External users are important too, but investigation differs on an organizational basis. Consider providing best practices for external users, and investigate external calls independently from the overall organization.

The actual measurement in CQD varies by workload, but for the purposes of this article, we focus primarily on the *Audio Poor Percentage* measurement. PSR is made up of the five network metric averages described in the following table. For a stream to be classified as poor, only one metric needs to exceed the defined threshold. CQD provides the "Poor Due To..." measurements to better understand what condition caused the stream to be classified as poor. To learn more, read Stream classification in CQD.

> **NOTE**
> CQD provides the "Poor due to..." measurements to better understand what condition caused the stream to be classified as poor.

Audio poor quality metrics

METRIC AVERAGE	DESCRIPTION	USER EXPERIENCE
Jitter >30 ms	This is the average change in delay between successive packets. Teams and Skype for Business can adapt to some levels of jitter through buffering. It's only when the jitter exceeds the buffering that a participant notices the effects of jitter.	The packets arriving at different speeds cause a speaker's voice to sound robotic.
Packet loss rate >10% or 0.1	This is often defined as a percentage of packets that are lost. Packet loss directly affects audio quality—from small, individual lost packets that have almost no impact to back-to-back burst losses that cause audio to cut out completely.	The packets being dropped and not arriving at their intended destination cause gaps in the media, resulting in missed syllables and words, and choppy video and sharing.
Round-trip time >500 ms	This is the time it takes to get an IP packet from point A to point B and back to point A. This network propagation delay is tied to the physical distance between the two points and the speed of light, and includes additional overhead taken by the various devices in the network path.	The packets taking too long to arrive at their destination cause a walkie-talkie effect.
NMOS degradation average >1.0	Average Network Mean Opinion Score (NMOS) degradation for the stream. Represents how much the network loss and jitter has affected the quality of received audio that caused the NMOS to drop by more than one point.	This is a combination of jitter, packet loss, and—to a lesser degree—increased round-trip time. The user might be experiencing a combination of these symptoms.

METRIC AVERAGE	DESCRIPTION	USER EXPERIENCE
Average ratio of concealed samples >7% or 0.07	Average ratio of the number of audio frames with concealed samples generated by packet loss healing to the total number of audio frames. A concealed audio sample is a technique used to smooth out the abrupt transition that would usually be caused by dropped network packets.	High values indicate that significant levels of loss concealment were applied and resulted in distorted or lost audio.

Why do we prefer to use streams instead of calls?

Streams let us know which particular leg of the call was poor - outgoing or incoming. When you're looking at call analytics for a poor call, determine whether the poor call was due to that caller's stream (outbound) or callee's stream (inbound). Determining which stream is impacting call quality is even more important for conferences. If you're only looking at call data, you'll see how many conferences a person participates in, but you won't see which people are active speakers, doing the most screen sharing.

Call data gives you usage metrics, but it won't necessarily lead you to the root cause for poor call quality. By looking at stream direction, you can identify factors such as a call that's not on a managed network, a call from a non-employee (e.g., a vendor or someone on a different network). In these cases, if the other person's network connection was poor, the entire call will be flagged as poor. You can't do anything about external factors, so this data isn't helpful.

Stream direction can also help you identify problematic devices or clients.

- For example, If you have a limited budget for devices and want to provide devices only for heavy audio users, use the audio usage report (VoIP) and filter for outbound streams and conferencing. Look for high-volume audio users who are speaking into built-in microphones - these may correlate to poorer call quality (and you might want to provide audio devices for these people). For added clarity, you could filter for packet utilization, which will let you target especially high-volume audio users.
- Another example involves screen sharing. If a customer is using an old Teams client, screen sharing performance may be affected. You could address this problem by prioritizing client upgrades for people who do a lot of screen sharing.
- By identifying which direction of a stream is causing poor call quality, you can determine whether you've got a QoS or bandwidth-related problem. If you haven't fully implemented QoS, or if you only mark packets at the client and not at the inbound stream, you might see poorer call quality. By looking at stream direction, you can get a more granular view of packet loss, latency, or jitter in a specific direction.
    - For example, let's say a user complains of robotic audio while on a wired connection (jitter). By looking at stream and direction, you can determine that the problem happens on the inbound stream, only for a specific set of subnets. After you give this information to your networking team, they can track it down to a misconfigured WAN accelerator that was not bypassing media traffic. Once the network team reconfigures the WAN accelerator, jitter disappears and call quality improves.

Setup Failure Rate

The setup failure rate, otherwise known as the *Total Call Setup Failure Percentage* measurement in CQD, is the number of streams where the media path couldn't be established between the endpoints at the start of the call.

This represents any media stream that couldn't be established. Given the severity of the impact of this problem on the user experience, the goal is to reduce this value to as close to zero as possible. A high value for this metric is more common in new deployments with incomplete firewall rules than a mature deployment, but it's still important to watch on a regular basis.

This metric is calculated by taking the total number of streams that failed to set up divided by the total number

of streams that submitted a successful call detail record (CDR):

- **Setup Failure Rate** = Total Call Setup Failed Stream Count / Total CDR Available Stream Count

Drop Failure Rate

The drop failure rate, otherwise known as the *Total Call Dropped Failure Percentage* measurement in CQD, is the percentage of successfully established streams where the media path didn't terminate normally.

This represents any media stream that terminated unexpectedly. Although the impact of this isn't as severe as a stream that failed to set up, it still negatively affects the user experience. Sudden and frequent media drops not only can have a severe impact on the user experience, they result in the need for users to reconnect, resulting in lost productivity (not to mention frustration).

The metric is calculated by taking the total number of dropped streams divided by the total count of streams that set up successfully:

- **Drop Failure Rate** = Total Call Dropped Stream Count / Total Call Setup Succeeded Stream Count

Define your target metrics

This section discusses some of the core service metrics that we use to assess the health of the services. By continually assessing and driving efforts to keep these metrics below their defined targets, you'll help ensure that your users experience consistent, reliable call quality. As a starting point, use the suggested targets in the table below. Adjust the targets as needed to meet your business objectives.

NETWORK TYPE		QUALITY TARGETS	RELIABILITY TARGETS	
		AUDIO POOR STREAM RATE	SETUP FAILURE RATE	DROP FAILURE RATE
All	Internal	2.0%	0.5%	2.0%
	Overall	3.0%	1.0%	3.0%
Conferencing	Internal	2.0%	0.5%	2.0%
	Wired internal	1.0%	0.5%	1.0%
	Wi-Fi 5 GHz internal	1.0%	0.5%	1.0%
	Wi-Fi 2.4 GHz internal	2.0%	0.5%	2.0%
	Overall	2.0%	0.5%	3.0%
P2P	Internal	2.0%	0.5%	2.0%
	Wired/Wi-Fi 5 GHz internal	1.0%	0.5%	1.0%
	Wired/Wi-Fi 5 GHz overall	2.0%	1.0%	1.0%
	Overall	2.0%	1.0%	3.0%

User experience

Analyzing the user experience is more art than science, because the metrics gathered here don't always mean

that there's a problem with the network or service but rather, they simply indicate that the user perceives a problem. CQD includes a built-in survey mechanism — Rate My Call (RMC) — to help gauge overall user experience. RMC will give you insight into the following questions from the perspective of your users:

- Do I know how to use the solution?
- Is the solution easy to use and intuitive, and does it support my day-to-day communication needs?
- Does the solution help me get my job done?
- What's my overall perception of the solution?
- Can I use the solution at any point in time, regardless of where I am?
- Can I set up and maintain a call?

Rate My Call

Rate My Call (RMC) is built into Teams and Skype for Business. It automatically pops up after one in every 10 calls, or 10 percent. This brief survey asks the user to rate the call and provide a little context for why the call quality might have been poor. A one or two rating is considered poor, three to four is good, and five is excellent. Although it's somewhat of a lagging indicator, this is a useful metric for uncovering issues that service metrics can miss.

> **NOTE**
> The human factor: Users often ignore the survey when call quality is good, and they fill it out when call quality is bad. As a result, your RMC reports might be skewed to the poor side even while service metrics are good.

You can use CQD to report on RMC user responses, and sample reports are included in the CQD template. However, they aren't discussed in detail in this article.

Client and device readiness

You need a solid client and device strategy to help ensure that your users have a consistent and positive user experience. A few key principles drive each readiness strategy.

Client readiness

Keeping the Teams client up-to-date ensures that your users are always getting the best-possible experience. Microsoft releases frequent updates to the Teams client (the update installs itself in the background unless you've turned off this functionality - which we don't recommend). It's also important to remember to patch network, video, USB, and audio drivers, because they're often overlooked and can affect call and meeting quality. Consider adding network, Wi-Fi, video, USB, and audio drivers to your current patch management process.

Device readiness

No one single strategy can affect the user experience more than your device readiness strategy. For example, users who rely on their laptop speakers and microphone will experience a lot of background noise in calls and meetings. Teams is designed to work with almost any device, but if you're having device-related problems, check out Phone for Teams.

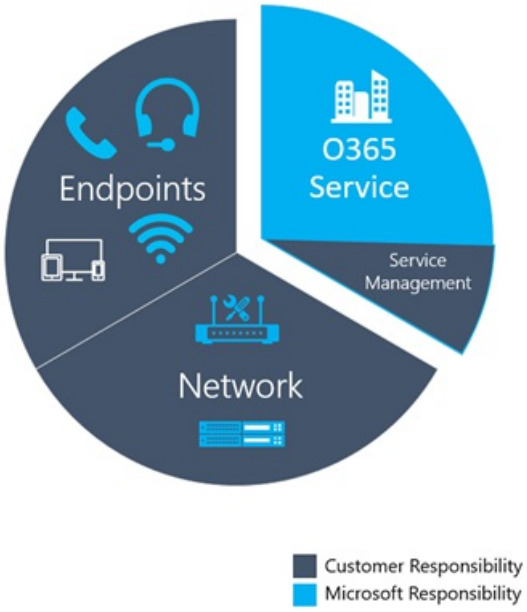
Categories of quality

Operationalize a set of quality-management practices - this gives you the best chance of good call and meeting quality. A good quality management plan addresses these categories:

- **Network:** Audio quality focused on the Poor Stream Ratio (PSR) metric, TCP usage, wired and wireless subnets, and identifying the use of HTTP proxies and VPN
- **Endpoints:** Audio devices and up-to-date clients
- **Service Management:** This category comprises two sections:
  - First is Microsoft's responsibility to manage and maintain the Teams and Skype for Business

Online services.

- Second are tasks your organization manages to ensure reliable access to the service, such as updating building information and maintaining firewalls for new Office 365 IP addresses as infrastructure is added to the service.



Review the following list of tasks recommended to maintain quality. You should perform these tasks regularly - for example, weekly.

Service management tasks

These tasks range from ensuring there is sufficient bandwidth to reach the service without saturating internet links, validating that quality of service (QoS) is in place on all managed network areas, and staying on top of Office 365 IP ranges on firewalls.

Network tasks

There are two categories of network tasks: reliability and quality. Reliability focuses on measuring the user's ability to make calls successfully and stay connected. Quality focuses on the aggregated telemetry sent to Teams and Skype for Business Online by the user's client during the call and after it has ended.

Given the critical impact that reliability has on the user experience, we recommend that you assess and investigate reliability metrics before you dive into quality.

Endpoints tasks

The main task in this category removing any obstacles to regular Teams client updates. By default, Teams automatically updates regularly (unless you turn off that setting, which we don't recommend).

You should also monitor devices and provide updates whenever you identify problems related to a device.

Use CQD to manage call quality

Once you've set up CQD, you're ready to start using it to manage call and meeting quality for your organization.

Most problems with Teams performance fall into the following categories:

- Incomplete firewall or proxy configuration
- Poor Wi-Fi coverage
- Insufficient bandwidth
- VPN
- Inconsistent or outdated client versions and drivers

- Unoptimized or built-in audio devices
- Problematic subnets or network devices

If you take the time before you roll out Teams to assess these areas and remediate any deficiencies, you'll reduce the amount of effort needed to maintain a high-quality Teams experience for all your users. For help assessing your network in preparation for your Teams rollout, read Advisor for Teams and Prepare your network for Teams.

Expectations using CQD

Use the Call Quality Dashboard (CQD) to gain insight into the quality of calls made by using Teams and Skype for Business services. CQD is designed to help Teams and Skype for Business admins and network engineers optimize the network and keep a close eye on quality, reliability, and the user experience. CQD looks at aggregate telemetry for an entire organization, where overall patterns can become apparent; this lets you make informed assessments and plan remediation. CQD provides reports of metrics that provide insight into overall quality, reliability, and user experience.

CQD, although useful for analyzing trends and subnets, doesn't always provide a specific cause for a given scenario. It's important to understand this and set the correct expectation when using CQD:

- CQD won't provide the root cause for every scenario
- CQD won't contain Phone System or Audio Conferencing streams
- CQD will call out areas for further investigation based on trends

CQD reports overview

Use the drop-down menu at the top of the screen to open a report. For a list of the data provided in each report, read Data available in CQD reports.

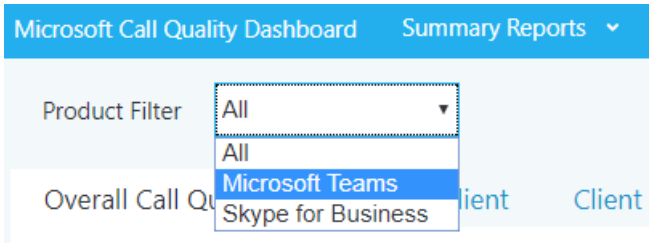
New in January 2020: Download Power BI query templates for CQD. Customizable Power BI templates you can use to analyze and report your CQD data.

Teams vs. Skype for Business

CQD can report on both Teams and Skype for Business. However, there might be times when you want to develop a report to look at Teams telemetry separate from Skype for Business.

Summary reports

To modify the summary reports page to look at only Teams or Skype for Business, select the **Product Filter** drop-down menu from the top of the screen, and then select the product you want.



Detailed reports

To filter all detailed reports, in the browser bar, append the following to the end of the URL:

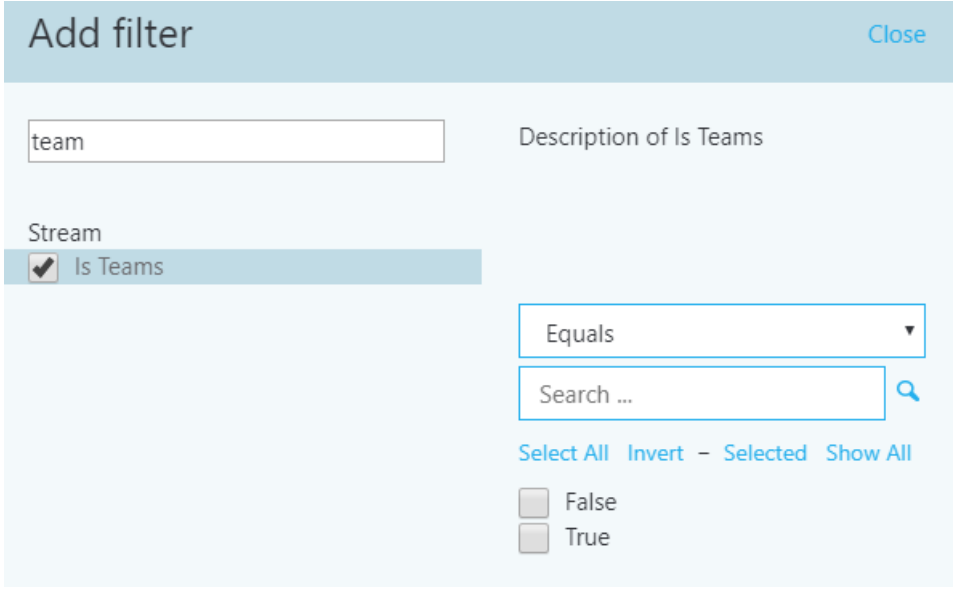
```
/filter/[AllStreams].[Is Teams]|[FALSE]
```

Example:

```
https://cqd.teams.microsoft.com/cqd/#/1234567/2018-5/filter/[AllStreams].[Is Teams]|[FALSE]
```

For more information about URL filters, read Filtering reports later in this section.

To filter an individual detailed report, add the filter `Is Teams` to the report and set it to True or False.



Managed versus unmanaged networks

By default, all endpoints in CQD are classified as external. As soon as a building file is introduced, we can begin to look at managed endpoint data. As previously discussed, networks in CQD are defined as:

- A *managed network*, often referred to as internal or inside, can be influenced and controlled by the organization. This includes the internal LAN, the remote WAN, and VPN.
- An *unmanaged network*, often referred to as external or outside, can't be influenced or controlled by the organization. An example of an unmanaged network is a hotel or airport network.

Dimensions, measures, and filters

A well-formed CQD query contains all three of the following parameters:

- **Dimension:** How I want to pivot on the data.
- **Measure:** What I want to report on.
- **Filter:** How I want to reduce the dataset the query returns.

Another way to look at this is that a *dimension* is the grouping function, a *measure* is the data I'm interested in, and a *filter* is how I want to narrow down the results to those that are relevant to my query.

An example of a well-formed query is **Show me Poor Streams [Measure] by Subnet [Dimension] for Building 6 [Filter]**. For more information, see Dimensions and measures available in CQD.

First vs. second

Many of the dimensions and measures in CQD are classified as first or second. CQD doesn't use caller/callee fields—these have been renamed *first* and *second* because there are intervening steps between the caller and callee. The following logic determines which endpoint involved is labeled as first:

- **First** will always be a server endpoint (Conference Server, Mediation Server, and so on) if a server is involved in the stream or call.
- **Second** will always be a client endpoint unless the stream is between two server endpoints.
- If both endpoints are the same type, the choice of which is first is based on internal ordering of the user agent category. This ensures the ordering is consistent.

For more information about determining the first or second endpoint when they're both the same, see Dimensions and measures available in CQD.

Stream vs. call

You need to understand the difference between a call and a stream to properly choose which dimensions or measures you'll be looking at in CQD. Although CQD's primary focus is on streams, call-based measurements are also available.

- **Stream:** A *stream* exists between only two endpoints. There is only one stream for each direction, and two streams are required for communication. Streams are useful for investigating buildings, networks, or subnets. In some cases, both call and stream are used in the measurement's name (for example, Call Setup Stream or Call Dropped Stream). These are still classified as streams.
- **Call:** A *call* is a grouping of all streams from all participants. A call consists of—at minimum—two streams. A single call will have at least two endpoints, each with a minimum of one stream.

For additional guidance on whether the dimension or measure is referring to a call or a stream, see Dimensions and measures available in CQD

Good, poor, and unclassified calls

A call is categorized either as good, poor, or unclassified. Let's take a moment to talk about each one in more detail.

- **Good or poor:** A good or poor call consists of a call that contains a complete set of service metrics, for which a full QoE report was generated and received by the service. Determining whether a stream is good or poor is described earlier in this article.
- **Unclassified:** An unclassified stream doesn't contain a full set of service metrics. These can be short calls—usually less than 60 seconds—where averages couldn't be computed and a QoE report wasn't generated. The most common reason for calls to be unclassified is that there was little to no packet utilization. An example of this would be a participant who joins a meeting on mute and never speaks. The participant is receiving, but not transmitting, media. Without media being transmitted, there won't be any metrics available for CQD to use to classify the endpoint's outbound media stream.

To learn more, read Stream classification in CQD.

Common subnets

Common subnets are specific private subnets that are used by hotels, home networks, hotspots, and similar areas. These subnets are difficult to triage due to their widespread use. If your organization uses one of these common subnets, we recommend that you move that network to another subnet. This will make reporting easier in CQD. When noted, reports in the All Networks template have been configured to exclude these subnets to eliminate them as a source of poor quality. Common subnets are defined below; their impact will vary by organization.

- 10.0.0.0/24
- 192.168.0.0/24
- 192.168.1.0/24
- 192.168.2.0/24
- 172.20.10.0/24
- 192.168.43.0/24

When investigating a managed network that uses a common subnet, you'll need to use the Second Reflexive Local IP dimension to group subnets. This dimension contains the endpoint's public IP address.

Reliability investigations

The first step to improving quality is to assess the state of reliability across the organization. Because reliability is vital to a positive user experience, we start with the two components that measure reliability:

1. **Setup failures:** The call couldn't be established.
2. **Drop failures:** The call was established and unexpectedly terminated.

Throughout this section, we'll cover methods to investigate both areas.

> **NOTE**
> Not all reports included in the templates are covered in this article. However, the methods of investigation explained below still apply. Please refer to the individual report description for more information.

Setup failures

Prioritize remediating setup failures in this area first, because these failures have a significant negative impact on the user experience.

Begin your investigation by assessing the percentage of overall setup failures for the organization, and then prioritize areas of investigation based on the highest percentage by building or network.

Setup failure trend analysis

This report displays the total amount of streams, stream setup failures, and the stream setup failure rate. Point to any one of the columns to display its individual values.

Analysis

By using this report, you can answer the following questions and determine your next course of action:

- What is the total call setup failure percentage for the current month?
- Is the total call setup failure percentage below or above the defined target metric?
- Is the failure trend worse or better than the previous month?
- Is the failure trend increasing, steady, or decreasing?

Irrespective of your answers to these questions, take the time to investigate further by using the companion sub-reports to look for any individual buildings or subnets that might need remediation. Although the overall failure rate might be below the target metric, the failure rates for one or more buildings or networks might be above the target metric and need investigation.

Setup failure investigations

This summary report is used to discover and isolate any buildings or networks that might need remediation.

> **NOTE**
> Be sure to adjust the Month Year report filter to the current month. Select **Edit**, and adjust the **Month Year** report filter to save the new default month.

Remediation

Focus your first remediation efforts on buildings or subnets that have the largest volume of failures. This will maximize impact on the user experience and help to quickly reduce the rate of organizational call setup failures. The following table lists the two reasons for setup failures as reported by CQD.

CALL SETUP FAILURES REASON	TYPICAL CAUSE
Missing FW Deep Packet Inspection Exemption Rule	Indicates that network equipment along the path prevented the media path from being established due to deep packet inspection rules. This is likely due to firewall rules not being correctly configured. In this scenario, the TCP handshake succeeded but the SSL handshake didn't.

CALL SETUP FAILURES REASON	TYPICAL CAUSE
Missing FW IP Block Exception Rule	Indicates that network equipment along the path prevented the media path from being established to the Microsoft 365 or Office 365 network. This might be due to proxy or firewall rules not being correctly configured to allow access to IP addresses and ports used for Teams and Skype for Business traffic.

As you begin your remediation, you can focus your efforts on a particular building or subnet. As the preceding table shows, these issues are due to firewall or proxy configurations. Review the options in the following table for remediation actions.

REMEDIATION	GUIDANCE
Configure firewalls	Work with your network team and verify your firewalls configuration against the Office 365 IP address list. Verify that the media subnets and ports are included in the firewall rules. Verify that the necessary ports are opened in the firewall. UDP should be given priority because TCP is considered a failback protocol for audio, video, and video-based screen sharing, and its use will affect the quality of the call. Legacy RDP application sharing uses TCP only.

Drop failures

Unlike setup failure codes, CQD has no drop failure code to indicate why drop failures occur, which makes it difficult to isolate a specific root cause. To better triage drop failures, use an inferred approach. By remediating any areas of interest for media, patching clients and drivers, and driving usage of certified devices for Teams and Skype for Business, you can expect drop failures to decline.

Drop failure trend analysis

This report displays the total amount of audio streams, total drop failures, and the drop failure rate. Point to any one of the columns to display its values.

Analysis

By using this type of report, you can answer the following questions:

- What is the current drop failure rate?
- Is the drop failure rate below the defined target metric?
- Is the failure trend worse or better than the previous month?
- Is the failure trend increasing, steady, or decreasing?

Irrespective of the answers to the questions above, take the time to investigate using the sub-reports to look for any buildings or networks that might need remediation. Although the overall drop failure rate might be below the target metric, the drop failure rate for one or more buildings or networks might be above the target metric and need investigation.

Drop failure investigations

Failures reported here indicate that the call was dropped unexpectedly and resulted in a negative user experience. Unlike the trending reports, these reports provide additional insights into specific subnets that need further investigation.

Remediation

Using the included table reports, you can isolate problem areas in the network where the drop rate is above the target metric you've defined. Focus your first remediation efforts on buildings or subnets that have the highest

total stream count, to make the biggest impact.

Common causes of call drops:

- Under-provisioned network or internet egress
- No QoS configured on constrained networks
- Older client versions
- User behavior

After you discover your problem areas, you can use per-user call analytics to further review users in that building for specific issues. Call analytics contains additional EUII data and can be useful for further isolating potential reasons for the drop failures.

Regardless of your next step, it's a good practice to notify your helpdesk that an issue has been discovered with specific buildings or subnets. This lets the helpdesk quickly respond to incoming calls and triage users more efficiently. Flagged users can then be reported back to the engineering team for further investigation.

The following table lists some common methods to manage and remediate drop failures.

REMEDIATION	GUIDANCE
Network/internet	**Congestion**: Work with your network team to monitor bandwidth at specific buildings/subnets to confirm that there are issues with overutilization. If you do confirm that there is network congestion, consider increasing bandwidth to that building or applying QoS. Use the included Quality Poor Stream summary reports to review the problem subnets for issues with jitter, latency, and packet loss, because these will often precede a dropped stream. **QoS**: If increasing bandwidth is impractical or cost-prohibitive, consider implementing QoS. This tool is very effective at managing congested traffic and can guarantee that media packets on the managed network are prioritized above non-media traffic. Alternatively, if there's no clear evidence that bandwidth is the culprit, consider these solutions: • Microsoft Teams QoS guidance **Perform a network readiness assessment**: A network assessment provides details about expected bandwidth usage, how to cope with bandwidth and network changes, and recommended networking practices for Teams and Skype for Business. Using the preceding table as your source, you have a list of buildings or subnets that are excellent candidates for an assessment. • Prepare your organization's network for Teams
Clients (Skype for Business Online only)	Some older Skype for Business clients have known, documented issues with media reliability. Review the Call Analytics reports from multiple affected users, or create a custom Client Version table report in CQD filtered to specific buildings or subnets with Total Call Dropped Failure % measure. This information will help you understand whether a relationship exists between call drops in that specific building and a specific version of the client.

REMEDIATION	GUIDANCE
Devices	If devices are the culprit in call-quality problems, consider updating offending devices. Read Phones for Teams to learn more.
User behavior	If you determine that neither network, devices, or clients are the issue, consider developing a user adoption strategy to educate users how to best join and exit meetings. A smarter Teams and Skype for Business user will produce a better user experience for all participants in the meeting. For example, a user who puts their laptop to sleep (by closing the lid) without exiting the meeting will be classified as an unexpected call drop.

Quality investigations

The next step to assess the state of audio quality across the organization is to investigate Poor Stream Rate (PSR), TCP, and proxy usage. It's important to remember that CQD data doesn't provide you a specific root cause, but instead provides you with likely problem areas to begin a collaborative conversation with the appropriate teams for remediation activities.

> **NOTE**
> Not all reports included in the templates are covered in this article; however, the methods of investigation explained below will still apply for those reports. Refer to the individual report description for more information.

Quality

The PSR percentages are used to indicate whether the organization is meeting defined metric targets for a given focus area. It's important to note that even if the high-level percentages are within the defined target, individual subnets or buildings might not meet the defined targets and, therefore, need further investigation. For example, if the overall audio PSR percentage is 2 percent in April, which meets the sample target, individual buildings and subnets might still be having poor experiences, depending on the overall distribution of that 2 percent.

To assess the percentage of poor streams, use the quality reports. Various quality reports are provided to review metrics for overall, conferencing, two-party, PSTN calling, VPN, and meeting rooms. Monthly, weekly, and daily reports are provided to assist in this process. Weekly and daily reports are limited to the Managed Networks template to increase their effectiveness and reduce noise.

Quality trend analysis

Trending reports display quality information over time and are used to help identify and understand quality trends within each area of interest. As noted above, there are report trees included in the templates for investigating quality; conferencing, two-party, PSTN calling, VPN, and meeting rooms. For the purposes of analyzing quality, the investigative process is the same. However, we recommend that you start with conferencing first, because any improvements in conference quality will also positively affect all other areas.

> **NOTE**
> Investigating two-party, PSTN calling, and meeting rooms are similar to investigating conferencing. The focus is to isolate buildings or subnets that have the worst quality and identify the reason for the poor quality.

> **IMPORTANT**
>
> VPN-based reports are filtered by using the Second VPN dimension. This dimension requires that the VPN network adapter be properly registered as a Remote Access Adapter. VPN vendors don't reliably use this flag, and your mileage will vary depending on the VPN vendor deployed at your organization. Modify the VPN reports if needed by using the building or network name.

Investigation

By using these reports, you can answer the following questions:

- What is the total PSR for the current month?
- Is the PSR below the defined target metric?
- Is PSR worse or better than the previous month?
- Is the PSR trend increasing, steady, or decreasing?

Irrespective of the answers to the questions above, take the time to investigate by using the sub-reports to look for any buildings or subnets that might need investigation. Although the overall PSR might be below the target metric, often the PSR for one or more buildings or networks is above the metric and needs remediation.

Quality investigations

The quality summary reports give you deeper insight into what contributed to the streams' being classified as poor and helps to isolate problem areas in the managed network.

Although the dimensions used might differ slightly between report, each report will include measures for total streams, total poor streams, PSR, and poor quality due to. Reports have been created for each area of interest: conferencing, two-party, PSTN calling, VPN, and meeting rooms. The Managed Network template includes additional reports to take advantage of the location information uploaded via the building file.

> **NOTE**
>
> Common subnets are difficult to triage due to their widespread use. A separate report that displays the client's public IP (Second Reflexive Local IP) has been added to the All Networks template to assist with remediating offices that use common networks.

Poor Audio Stream Summary by City, Building, Network and Subnet - Conferencing

Summary of managed conference aduio streams. Sub-reports add additional dimensions and measures to help identify subnets for further investigation. The report is filtered to display subnets where PSR > 3%.

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Show 10 entries

Month Year	City	Building	Network	Subnet	Audio Streams	Poor Streams	Poor Stream Rate (%)	Jitter > 30ms	Packet Loss > 10%	Round Trip Time > 500ms
2018-04	Filter City	Filter Building	Filter Network	Filter Subnet	Filter Au	[1-9]	([3-9]\.)	Filter Ji	Filter Pa	Filter Ro
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	21155	1957	11.119	498	510	1431
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	12263	370	3.478	107	152	215
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	8033	321	4.906	96	101	219
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	6677	192	3.197	26	13	156
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	5611	287	6.529	108	97	127
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	4056	194	6.029	40	75	87
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	3646	152	4.697	15	81	60
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	3391	119	3.697	0	78	0
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	2751	86	3.517	2	73	32
2018-04	[redacted]	[redacted]	[redacted]	[redacted]	2678	74	3.158	31	3	43

Remediation

Focus your remediation efforts on buildings or subnets that have the largest volume of streams, because this will maximize impact and help to improve the user experience quickly. Use the jitter, packet loss, and round-trip time (RTT) measurements to understand what's contributing to the poor quality (it's possible for there to be more than one problem):

- **Jitter**: Media packets are arriving at different speeds, which causes a speaker to sound robotic.
- **Packet loss**: Media packets are being dropped, which creates the effect of missing words or syllables.
- **RTT**: Media packets are taking a long time to get to their destination, which creates a walkie-talkie effect.

To assist your investigation into quality issues, use per-user call analytics. With Call Analytics, you can look at a specific conference or user's call report. This report will contain EUII/PII data and is useful when you're looking for the cause of a failure. After you know which building is affected, it should be straightforward to track down users in that building.

Don't forget to let your helpdesk know that these networks are experiencing quality issues, so they can quickly triage and respond to incoming calls.

REMEDIATION	GUIDANCE
Networks	**Congestion**: An overused or under-provisioned network can cause issues with media quality. Work with the network team to determine whether the network connections from the user to the internet egress point has enough bandwidth to support media. **Perform a network readiness assessment**: A network assessment provides details about expected bandwidth usage, how to cope with bandwidth and network changes, and recommended networking practices for Teams and Skype for Business. Using the preceding table as your source, you have a list of buildings or subnets that are excellent candidates for an assessment. • Prepare your organization's network for Teams
Quality of Service (QoS)	QoS is a proven tool to help prioritize packets on a congested network to ensure they arrive at their destination intact and on time. Consider implementing QoS across your organization to maximize the quality of the user experience where bandwidth is constrained. QoS will help solve issues typically associated with high levels of packet loss, and—to a lesser degree—jitter and round-trip times. • Teams QoS guidance

REMEDIATION	GUIDANCE
Wi-Fi	Wi-Fi can have a significant impact on call quality. Wi-Fi deployments don't typically take into consideration the network requirements for VoIP services and are often a source of poor quality. For more information about optimizing your Wi-Fi infrastructure, see this article about Wi-Fi planning. **Wireless driver**: Ensure that wireless drivers are up to date. This will help mitigate any poor user experience related to an outdated driver. Many organizations don't include wireless drivers in their patch cycles, and these drivers can go unpatched for years. Many wireless issues are solved by ensuring the wireless drivers are up to date. **WMM**: Wireless Multimedia Extensions (WMM), also known as Wi-Fi Multimedia, provides basic QoS features to wireless networks. Modern wireless networks must support many devices. These devices compete for bandwidth and can lead to quality issues for VoIP services, where speed and latency are vital. Consult your wireless vendor for specifics and consider implementing WMM on your wireless network to prioritize Skype for Business and Teams media. **Access point density**: Access points might be too far apart or not in an ideal location. To minimize potential interference, place extra access points in conference rooms and in locations that aren't obstructed by walls or other objects where the Wi-Fi signal is weak. **2.4 GHz versus 5 GHz**: 5 GHz provides less background interference and higher speeds, and should be prioritized when deploying VoIP over Wi-Fi. However, 5 GHz isn't as strong as 2.4 GHz and doesn't penetrate walls as easily. Review your building layout to determine which frequency you can rely on for the best connection.
Network device	Larger organizations might have hundreds of devices spread out across the network. Work with your network team to ensure that the network devices from the user to the internet are maintained and up to date.
VPN	VPN appliances aren't traditionally designed to handle real-time media workloads. Some VPN configurations prohibit the use of UDP (which is the preferred protocol for media) and rely on TCP only. Consider implementing a VPN split-tunnel solution to help reduce VPN as a source of poor quality.
Clients (Skype for Business Online only)	Ensure all clients are being regularly updated.
Devices	If devices are the culprit in call-quality problems, consider updating offending devices. Read Phones for Teams to learn more.
Drivers	Patching network (Ethernet and Wi-Fi), audio, video, and USB drivers should be part of your overall patch management strategy. Many quality issues are solved by updating drivers.

REMEDIATION	GUIDANCE
Meeting rooms on Wi-Fi	We highly recommend that meeting room devices be connected to the network by using at least a 1-Gbps Ethernet connection. Meeting room devices typically include multiple audio and video streams, along with meeting content such as screen sharing, and have higher network requirements than other Teams or Skype for Business endpoints. Meeting rooms are, by definition, stationary devices where Wi-Fi affords a benefit only during installation. Meeting rooms need to be treated with extra care and attention to ensure that the experience using these devices is meeting or exceeding expectations. Quality issues with meeting rooms are usually going to be escalated quickly, because they're often used by senior-level staff. With all things being equal (apart from convenience), Wi-Fi performance is often less than a wired connection. With the rise of "bring your own device" policies and the proliferation of laptops, Wi-Fi access points are often over-utilized. Real-time media might not be prioritized on Wi-Fi networks, which can lead to quality issues during peak use times. This heavy usage can coincide with a meeting where there might be a dozen people in attendance, each with their own laptop and smartphone, all connected to the same Wi-Fi access point as the meeting room device. Wi-Fi should only be considered as a temporary solution, for a mobile installation, or when Wi-Fi has been properly provisioned to support business-class, real-time–based media.

TCP

Transmission Control Protocol (TCP) is considered a failback transport and not the primary transport you want for real-time media. The reason it's a failback transport is due to the stateful nature of TCP. For example, if a call is made on a latent network and media packets are delayed, then packets from a few seconds ago—which are no longer useful—compete for bandwidth to get to the receiver, which can make a bad situation worse. This makes the audio healer stitch and stretch audio, resulting in audible artifacts, often in the form of jitter.

The reports in this section don't make a distinction between good and poor streams. Given that UDP is preferred, the reports look for the use of TCP for audio, video, and video-based screen sharing (VBSS). Poor stream rates are provided to help compare UDP quality versus TCP quality so that you can focus your efforts where the impact is the greatest. TCP usage is primarily caused by incomplete firewall rules. For more information about firewall rules for Teams and Skype for Business Online, see Microsoft 365 and Office 365 URLs and IP address ranges.

> **NOTE**
> Audio, video, and VBSS all prefer UDP as their primary transport. The legacy RDP Application Sharing workload only uses TCP.

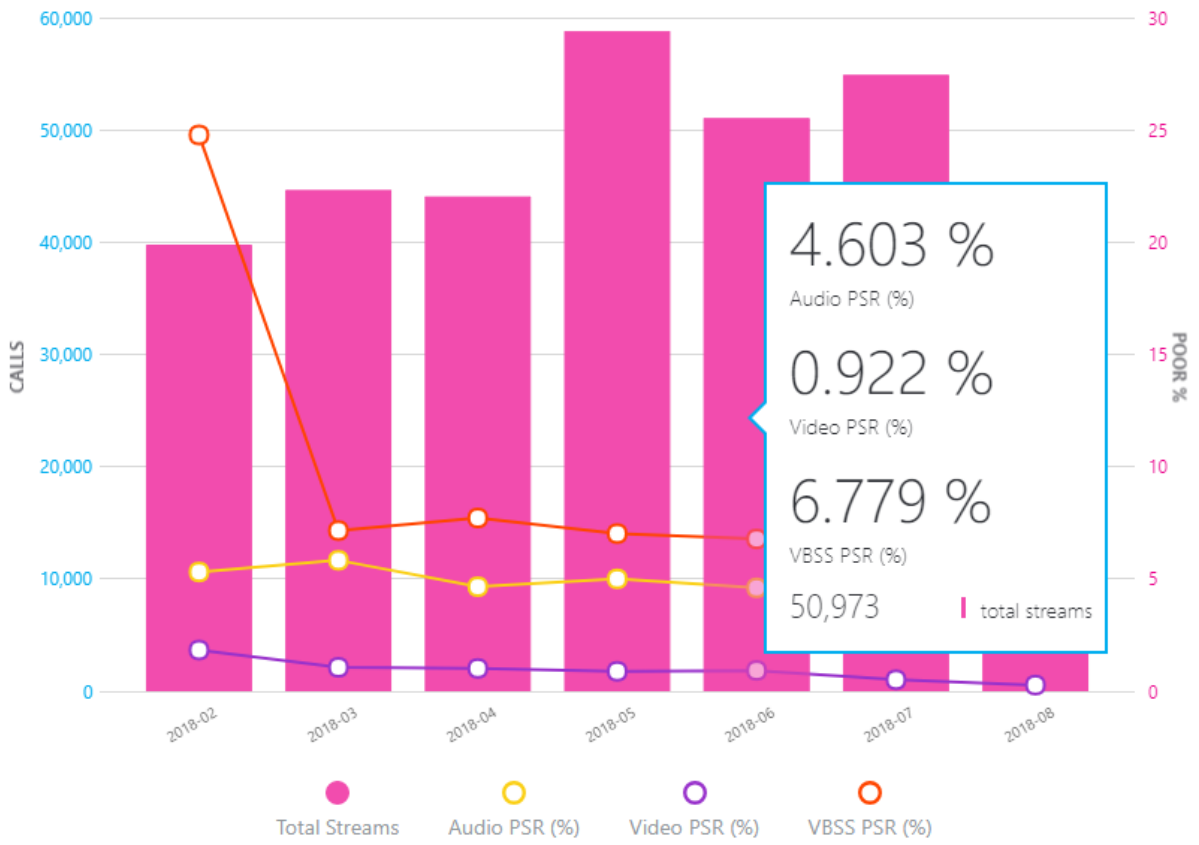
TCP usage

TCP reports indicates the overall TCP usage over the last seven months. All further reports in this section will focus on narrowing down specific buildings and subnets where TCP is most commonly used. Separate reports are available for both conferencing and two-party streams.

TCP Usage

This report indicates the amount of TCP used on the managed network for UDP based (audio, video & VBSS) media conference streams. It is strongly recommended to use UDP wherever possible. High TCP usage typically indicates a network device configuration issue, typically a firewall. Sub-reports will provide specifics to assist in investigating further.

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Investigation

By using this report, you can answer the following questions:

- What is the total volume of TCP streams for the current month?
- Is it worse or better than the previous month?
- Is the TCP usage trend increasing, steady, or decreasing?
- Is the TCP PSR the same as my overall PSR?

If you notice that the TCP usage trend is increasing or above normal monthly usage, take the time to investigate by using the sub-reports to look for any buildings or networks that might need remediation. Ideally, you want as few TCP-based audio sessions as possible on the managed network.

TCP vs. UDP

This report identifies the volume of TCP versus UDP usage reporting on the latest month for audio, video, and video-based screen sharing (VBSS).

TCP vs UDP - Conferencing

Summary report displaying the volume of managed TCP vs. UDP conference streams in the environment while also showing the Poor Stream Rates (PSR) for comparison.

Edit Clone Add Sub-Report •••

Show 10 entries

Transport	Month	Audio Streams	Audio PSR (%)	Video Streams	Video PSR (%)	VBSS Streams	VBSS PSR (%)
Filter Transport	Filter Month	Filter Au	Filter Au	Filter Vic	Filter Vic	Filter VB	Filter VB
UDP	2018-05	1,782,305	1.092	176,666	7.088	371,770	7.212
TCP	2018-05	21,469	5.162	968	7.541	4,151	37.05

Analysis

Although you want TCP usage to be as low as possible, you might see a bit of TCP usage in an otherwise healthy deployment. TCP by itself won't contribute to a poor call, so stream rates are provided to help identify whether TCP usage is a contributor to poor quality.

TCP investigations

In the provided CQD templates, navigate to the TCP Streams by Building and Subnet reports by using either the Managed Networks or All Networks template. For the purpose of investigating TCP usage, the process is the same, so we'll focus the discussion here on conferencing.

Remediation

This report identifies specific buildings and subnets that are contributing to the volume of TCP usage. An additional report is also included to identify the Microsoft Relay IP that was used in the call to help isolate missing firewall rules. Focus your remediation efforts on those buildings that have the highest volume of TCP streams to maximize impact.

The most common cause of TCP usage is missing exception rules in firewalls or proxies. We'll be talking about proxies in the next section, so for now focus your efforts on the firewalls. By using the building or subnet provided, you can determine which firewall needs to be updated.

REMEDIATION	GUIDANCE
Configure firewall	Verify that Microsoft 365 or Office 365 IP ports and addresses are excluded from your firewall. For media-related TCP issues, focus your initial efforts on the following: • Verify that the client media subnets 13.107.64.0/18 and 52.112.0.0/14 are in your firewall rules. • UDP ports 3478–3481 are the required media ports and must be opened, otherwise the client will fail back to TCP port 443.
Verify	Use the Microsoft Network Assessment Tool to check for issues with connectivity to specific Microsoft 365 or Office 365 IP addresses and ports from the affected building or subnet.

HTTP proxy

HTTP proxies aren't the preferred path for establishing media sessions, for a multitude of reasons. Many contain deep packet inspection features that can prevent connections to the service from being completed and

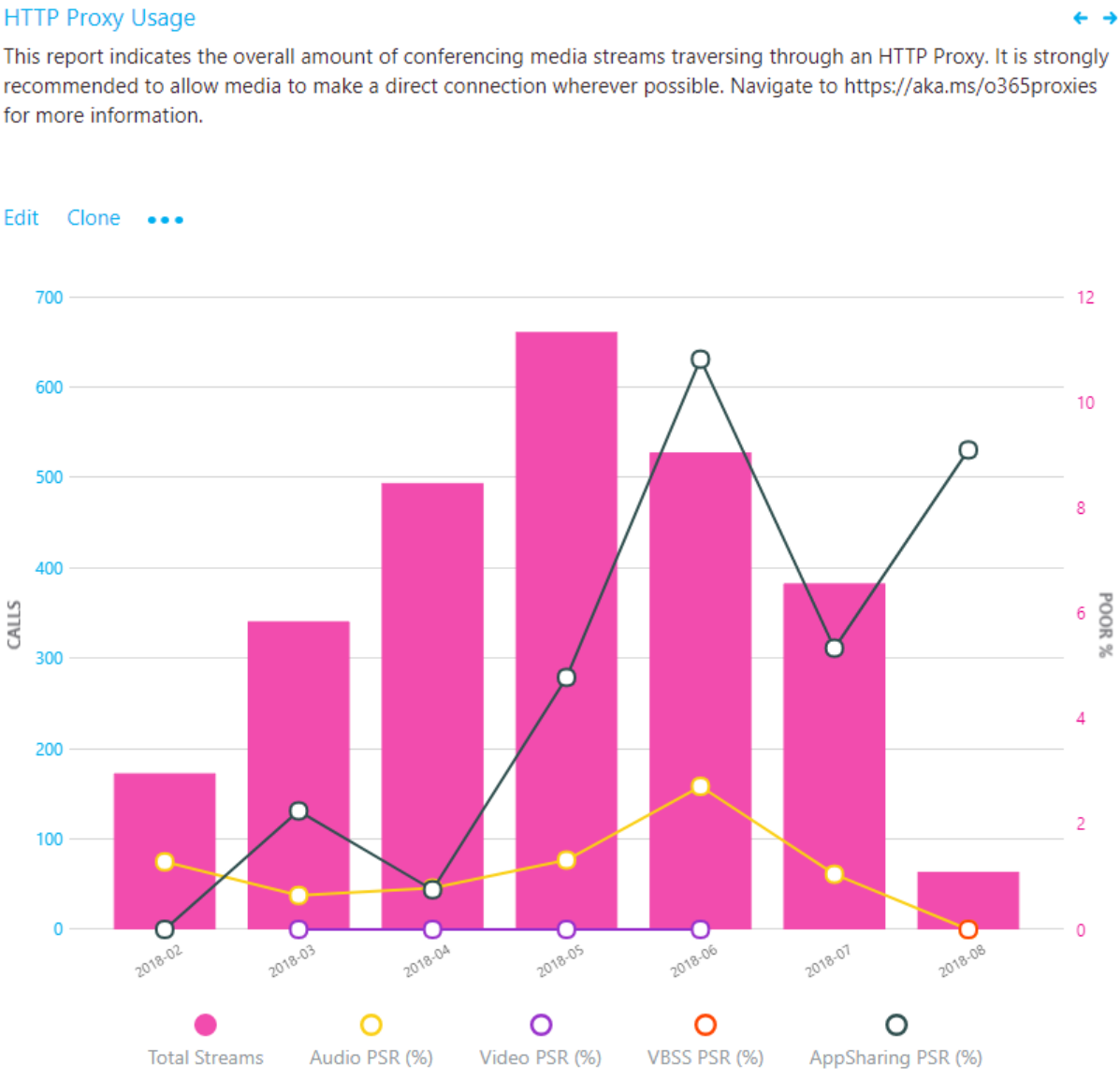
introduce disruptions. Additionally, almost all proxies force TCP as opposed to allowing UDP, which is recommended for optimal audio quality.

We always recommend that you configure the client to directly connect to Teams and Skype for Business services. This is especially important for media-based traffic.

> **IMPORTANT**
>
> We recommend that you upload a valid building file so you can distinguish inside from outside audio streams when analyzing proxy usage.

HTTP proxy usage

The HTTP proxy stream report in this section of the template is much like the TCP reports. It doesn't look at whether calls are poor or good, but whether the call is connected over HTTP.



Analysis

You want to see as few HTTP media streams as possible. If you have streams traversing your proxy, consult your networking team to ensure that the proper exclusions are in place so that clients are directly routing to Teams or Skype for Business Online media subnets.

If you have only one internet proxy in your organization, verify the proper Microsoft 365 or Office 365 URLs and IP address range exclusions. If more than one internet proxy is configured in your organization, use the HTTP sub-report to isolate which building or subnet is affected.

For organizations that can't bypass the proxy, ensure that the Skype for Business client is configured to sign in properly when it's located behind a proxy, as outlined in the article Skype for Business should use proxy server to sign in instead of trying direct connection.

HTTP proxy investigations

This report identifies specific buildings and subnets that are contributing to HTTP usage.

Remediation

We recommend that you always bypass proxies for Skype for Business and Teams, especially media traffic. Proxies don't make Skype for Business more secure, because its traffic is already encrypted. Performance-related problems can be introduced to the environment through latency and packet loss. Issues such as these will result in a negative experience with audio, video and screen sharing, where real-time streams are essential.

The most common cause of HTTP usage is missing exception rules in proxies. By using the building or subnet provided, you can quickly determine which proxy needs to be configured for media bypass.

Verify that the required Microsoft 365 or Office 365 FQDNs are whitelisted in your proxy.

Endpoint investigations

This section is focused on the tasks for reporting on client versions and the use of certified devices. Reports are available to outline usage for client versions, client type, capture devices and drivers (microphone), video capture devices, and Wi-Fi vendor and driver versions.

> **NOTE**
> Not all reports included in the templates are covered in this article; however, the methods of investigation explained below still apply. Refer to the individual report description for more information.

Client versions

These reports focus on identifying Skype for Business client versions in use and their relative volume in the environment.

> **IMPORTANT**
> Currently, Teams clients are distributed and updated automatically through the Azure Content Delivery Network and will be kept up to date by the service. As a result, you don't need to monitor Teams client versions (unless you turn off the auto updating, which we don't recommend).

Unless you exclude federated participant data, these reports will include client telemetry from federated endpoints. To exclude federated endpoints, you must add a query filter for Second Tenant ID set to your organization's tenant ID. Alternatively, you can use a URL filter to exclude federated participant telemetry.

Remediation

A critical part of driving high-quality user experiences is ensuring that managed clients are running up-to-date versions of Skype for Business, in addition to ensuring the supporting audio, video, network, and USB drivers are up to date. This provides several benefits, among them:

- It's easier to manage a few versions versus many versions.
- It provides a level of consistency of experience.
- It makes it easier to troubleshoot problems with call quality and usability.
- Microsoft continually makes general improvements and optimizations across the product. Ensuring that users receive these updates reduces their risk of running into a problem that has already been solved.

Limiting your deployment to client versions that are less than six months old will improve the overall user

experience and improve manageability by reducing the number of versions that need to be supported.

If you're using only Office Click-to-Run, you'll automatically be within the six-month window. No further action is required.

If you have a mix of Click-to-Run and installer packages (MSI), you can use the report to verify that the MSI clients are being updated regularly. If you notice clients are falling behind, work with the team responsible for managing Office updates and ensure that they're approving and deploying client patches regularly.

It's also important to consider and ensure that the network, video, USB, and audio drivers are being patched as well. It can be easy to overlook these drivers and not include them in your patch management strategy.

Version numbers for Skype for Business can be found via the links below:

- Release information for updates to Microsoft 365 Apps
- Update history for Microsoft 365 Apps for enterprise
- Skype for Business downloads and updates

Devices

To make use of the microphone device report, we need to understand the concept of the mean opinion score (MOS). MOS is the gold-standard measurement to gauge the perceived audio quality. It's represented as an integer rating from 0 to 5.

The basis of all measures of voice quality is how a person perceives the quality of speech. Because it's affected by human perception, it's inherently subjective. There are several different methodologies for subjective testing. Most voice quality measures are based on an absolute categorization rating (ACR) scale.

In an ACR subjective test, a statistically significant number of people rate their quality of experience on a scale of 1 (bad) to 5 (excellent). The average of the scores is the MOS. The resulting MOS depends on the range of experiences that were exposed to the group and to the type of experience being rated.

Because it's impractical to conduct subjective tests of voice quality for a live communication system, Microsoft Teams and Skype for Business generate MOS values by using advanced algorithms to objectively predict the results of a subjective test.

The available set of MOS and associated metrics provide a view into the quality of the experience being delivered to the users by an audio device.

By supplying users with devices certified for Teams and Skype for Business, you reduce the likelihood of encountering negative experiences due to the device itself (which is more likely, for example, with built-in laptop speakers and microphones). For more information, see these articles on the certification program and the partner solutions catalog.

The device reports are used to assess device usage by volume and MOS score (audio only), and can be found in the accompanying templates under Clients & Devices.

> **IMPORTANT**
>
> Unless you exclude federated participant data, these reports will include client telemetry from federated endpoints. To exclude federated endpoints, you must add a query filter for **Second Tenant ID** set to your organization's tenant ID. ALternatively, you can use a URL filter to exclude federated participant telemetry.

> **NOTE**
>
> You might notice when viewing this report that you see the same device reported multiple times. This is due to the way the device is reported being reported to CQD. Differences in hardware and OS locale cause differences in how device data is reported.

Remediation

Typically, you'll need to discover and phase out non-certified devices and replace them with certified devices. Some considerations when reviewing the device reports include:

- Are the devices in use certified for Teams and Skype for Business?
- You can identify users of a specific device by using per-user call analytics. Check to make sure they have the latest device drivers and that their device isn't connected through a USB hub or docking station.
- How many different versions of various drivers are in use? Are they being patched regularly? Ensuring that audio, video, and Wi-Fi drivers are being patched regularly will help eliminate these as a source of quality issues and make the user experience more predictable and consistent.

Audio

The next task is to determine the overall usage of certified audio devices. We recommend that at least 80 percent of all audio streams use a certified audio device. This is best accomplished by exporting the microphone devices report to Excel to calculate the usage of certified or approved devices. Organizations typically keep a list of all approved devices, so filtering and sorting the data should be straightforward.

Video

Video drivers are important to keep updated as well. Ensuring that video cards are being regularly patched will help exclude video drivers as a source of poor quality for video streams. Using certified video devices will help ensure a smooth and high-quality user experience. Video devices that support H.264 native encoding are preferred, to reduce CPU usage during video conferencing.

Wi-Fi

Wi-Fi drivers also need to be patched on a regular cadence as well and should be included in your patch management strategy. Many quality issues can be corrected by maintaining up-to-date Wi-Fi drivers. For more information about optimizing your Wi-Fi infrastructure, see this article about Wi-Fi planning.

Related topics

Use Advisor for Teams

Prepare your network for Teams

Office 365 Network Connectivity Principles

Teams analytics and reporting

Manage your devices in Teams

Improve and monitor call quality for Teams

What is CQD?

Set up Call Quality Dashboard (CQD)

Upload tenant and building data

CQD data and reports

Dimensions and measures available in CQD

Stream Classification in CQD

Use Power BI to analyze CQD data

Call Quality Dashboard (CQD) Frequently asked questions (FAQ)

8/6/2020 • 5 minutes to read • Edit Online

Frequently asked questions

Why does CQD mark a call as "Good" if one or more meeting participants had a poor experience?

Why do I see up to 0.2% difference in call and user count values on measures and how to get most accurate volumes?

Why is CQD data from Skype for Business different than CQD data from Teams?

Why can't I see EUII in CQD?

Why am I seeing Skype for Business information in CQD when I've filtered for Teams only?

Why does CQD mark a call as "Good" if one or more meeting participants had a poor experience?

Check out the rules CQD uses for stream classification.

For audio streams, any of the 5 classifiers, which are calculated for the average based on the length of the call, could all be within "good" parameters. It doesn't mean the users didn't experience something that contributed to an audio drop out, static, or glitch.

To determine if it was a network problem, look at the delta between the average values for the session and the max values. Max values are the maximum detected and reported during the session.

Here's an example of how to troubleshoot this situation. Let's say you take a network trace during a call and the first 20 minutes there are no lost packets but then you have a gap of 1.5 seconds of packets and then good for the remainder of the call. The average is going to be <10% (0.1) Packet loss even in a Wireshark trace RTP analysis. What was the Max Packet Loss? 1.5 Seconds in a 5-second period would be 30% (0.3). Did that occur within the five second sampling period (maybe or it could be split over the sampling period)?

If network metrics look good in the averages and max values, then look to other telemetry data:

- Check CPU Insufficient Event Ratio to see if the detected CPU resources available were insufficient and caused poor quality.
- Was the audio device in Half Duplex mode to prevent feedback due to microphones that are to close to speakers?
- Check the Device Half Duplex AEC Event Ratio. Was the device glitching or the microphone glitching introducing noise or static due to USB Audio Drop outs when plugged into a Hub or Docking Station:
- Check the Device Glitches and Microphone glitches event ratios. Was the device itself functioning properly?
- Check the Capture and Render Device Not Functioning Event Ratios.

For more on dimensions and measures available in CQD telemetry, read Dimensions and measurements available in Call Quality Dashboard.

For background noise, check mute event ratio to see the length of time participants were muted.

Create detailed reports in CQD and filter on Meeting ID to look at all users and streams in a meeting and add the fields you are interested in. A user reporting the issue may not be the one that was having the issue. They are just reporting the experience.

The telemetry will not necessarily call out the issue, but it can help you better understand where to look and inform your decisions. Is it network, device, driver or firmware updates, usage, or user?

Why do I see up to 0.2% difference in call and user count values on measures and how to get most accurate volumes?

To compute call count and user count measures, a distinct countif operation is performed against the call or user identifiers in the data set. On large data sets, there is an up to 0.2% error inherent with the distinct countif operation. For the most accurate volume, you should rely on stream count measures since they do not rely on this distinct countif operation. Filtering to reduce the data volume may reduce the error but may not eliminate this source of error in distinct call and user counts. Refer to Dimensions and measurements available in Call Quality Dashboard for which measures are impacted.

Why is CQD data from Skype for Business different than CQD data from Teams?

> **IMPORTANT**
> As of July 1, 2020, the older CQD (CQD.lync.com) uses data from the latest CQD (CQD.Teams.microsoft.com). The older CQD data is no longer available, and you can't export your building or report data. You can still use CQD.lync.com (available from the Skype for Business admin center), but we'll turn off access to CQD.lync.com soon, so you should move to CQD.Teams.microsoft.com if you haven't already done so.

If you're trying to compare data between the older CQD from the Skype for Business legacy portal (cqd.lync.com) and the latest CQD from the Teams admin center (cqd.teams.microsoft.com), you'll quickly notice that the data doesn't match. That's because the latest CQD reports on many additional calling scenarios. If you're still using reports from the older CQD, use this article to help you interpret those reports: Call Quality Dashboard for Skype for Business Server.

Why can't I see EUII in CQD?

These admin roles can access CQD, but they can't view EUII (end-user identifiable information):

- Microsoft 365 Reports Reader
- Teams Communications Support Specialist

To learn more about roles that can access CQD - including EUII - read Assign roles for accessing CQD.

Why am I seeing Skype for Business information in CQD when I've filtered for Teams only?

When you filter for Teams only in CQD reports (isTeams = 1), you're filtering for all calls where the *first endpoint* is Teams. If the *second endpoint* is Skype for Business, that information will show up in your CQD report.

CQDv2 and CQDv3 will always have different total counts since CQDv3 will have new scenarios that CQDv2 will not have. That's why comparing Summary Total or Aggregated all-up numbers with no filters will have these expected differences.

Depending on Customers' scenario, CQDv3 will include SFB 2019 on-premises calls (if SFB 2019 is used with a data connector), Skype Bot calls (AA, CVI, VDI), Live Events and PSTN calls. Scenarios/Features which are available for the customers, but their data are not in CQD V2.

For instance, it is expected that your customers and you will see 200,000 audio streams, with 5000 failures in CQD V2 Summary Report; versus 300,000 audio streams with 5500 failures (coming from 2019 on-prem calls, CVI calls, PSTN calls etc) in CQD V3.

In order to determine, if there are any unexpected differences, you must look at various breakdowns of the overall data. Compare with intent. Slicing the data by User Agent Category Pair is one of the first things we recommend. *First Product* and *Second Product* are also good slicers.

Related topics

Improve and monitor call quality for Teams

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Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Stream Classification in CQD

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Teams Troubleshooting

Dimensions and measurements available in Call Quality Dashboard (CQD)

8/25/2020 • 106 minutes to read • Edit Online

The Call Quality Dashboard (CQD) for Microsoft Teams and Skype for Business Online allows you to better understand call quality of calls made with these services. This topic provides detailed information about the dimensions and measurements visible through CQD. To learn more about CQD, see Use CQD to manage call and meeting quality in Microsoft Teams.

First and Second endpoint classification

Many of the dimensions and measurements in CQD are labeled as first or second. The following logic determines which endpoint involved in the stream or call is labeled as first:

- A Server endpoint (AV MCU, Mediation Server, and so on) is considered First when a Server is involved in the stream or call.
- A Client endpoint is considered Second unless the stream is between two Server endpoints.
- If both endpoints are the same type, first vs. second is set based on internal ordering of the user agent category to ensure that the ordering is consistent.

For example, here each row represents a pair of User Agents involved in a stream:

USER AGENT CATEGORY OF CALLER	USER AGENT CATEGORY OF CALLEE	FIRST ENDPOINT	SECOND ENDPOINT	FIRST IS CALLER
AV-MCU	OC (Skype for Business client)	AV-MCU	OC (Skype for Business client)	TRUE
OC (Skype for Business client)	AV-MCU	AV-MCU	OC (Skype for Business client)	FALSE
OC (Skype for Business client)	OC (Skype for Business client)	OC (Skype for Business client)	OC (Skype for Business client)	FALSE
AV-MCU	Mediation Server	Mediation Server	AV-MCU	
Mediation Server	AV-MCU	Mediation Server	AV-MCU	TRUE
OC (Skype for Business client)	OC Phone (Skype for Business IP Phone)	OC (Skype for Business client)	OC Phone (Skype for Business IP Phone)	TRUE
OC Phone (Skype for Business IP Phone)	OC (Skype for Business client)	OC (Skype for Business client)	OC Phone (Skype for Business IP Phone)	FALSE

NOTE

That First and Second classification is separate from which endpoint is the caller or callee. The First Is Caller dimension can be used to help identify which endpoint was the caller or callee.

Dimensions

Dimensions information is based in part on data uploaded to the CQD portal. Many Dimension values can also be used as filters. The following table lists the dimensions currently available in CQD, in the order listed in the Query Editor used to create reports or edit previously defined reports.

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Endpoint			
First CPU Name	String	Name of the CPU used by the first endpoint. **Example value:** Contoso CPU X11 @ 1.80 GHz	• This data was not reported by the endpoint
Second CPU Name	String	Name of the CPU used by the second endpoint. **Example value:** Contoso CPU X11 @ 1.80 GHz	• This data was not reported by the endpoint
First CPU Number Of Cores	Number of cores	Number of CPU cores available on the first endpoint. **Example value:** 8	• This data was not reported by the endpoint
Second CPU Number Of Cores	Number of cores	Number of CPU cores available on the second endpoint. **Example value:** 8	• This data was not reported by the endpoint
First CPU Processor Speed	CPU speed in MHz	Speed in MHz of the CPU used by the first endpoint. **Example value:** 1800	• This data was not reported by the endpoint
Second CPU Processor Speed	CPU speed in MHz	Speed in MHz of the CPU used by the second endpoint. **Example value:** 1800	• This data was not reported by the endpoint
First Endpoint	String	Machine name reported by the first endpoint if the endpoint is a server or a cloud service client. **Example value:** MACHINENAME	• This data was not reported by the endpoint
Second Endpoint	String	Machine name reported by the second endpoint if the endpoint is a server or a cloud service client. **Example value:** MACHINENAME	• This data was not reported by the endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First OS	String	Full Operating System and architecture string reported by the first endpoint. **Example value:** Windows 10.0.14996 SP: 0.0 Type: 1(Workstation) Suite: 256 Arch: x64 WOW64: True	• This data was not reported by the endpoint
Second OS	String	Full Operating System and architecture string reported by the second endpoint. **Example value:** Windows 10.0.14996 SP: 0.0 Type: 1(Workstation) Suite: 256 Arch: x64 WOW64: True	• This data was not reported by the endpoint
First OS Filtered	String	Operating System name and major and minor version reported by the first endpoint. This string can contain more than the OS name and version. **Example value:** Windows 10	• The endpoint did not report this information • The report from this endpoint was not received.
Second OS Filtered	String	Operating System name and major and minor version reported by the second endpoint. This string can contain more than the OS name and version. **Example value:** Windows 10	• The endpoint did not report this information • The report from this endpoint was not received
First OS Architecture	String	Hardware architecture reported by the first endpoint. **Example value:** x64	• The endpoint did not report this information • The report from this endpoint was not received • The format of the architecture wasn't recognized
Second OS Architecture	String	Hardware architecture reported by the second endpoint. **Example value:** x64	• The endpoint did not report this information • The report from this endpoint was not received • The format of the architecture wasn't recognized
First Virtualization Flag	Enumeration **Possible values:** "0x00" = None " "0x01" = HyperV "0x02" = VMWare "0x04" = Virtual PC "0x08" = Xen PC	Flag that indicates the type of virtualization environment reported by the first endpoint.	• Data was not reported by the endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Virtualization Flag	Enumeration **Possible values:** "0x00" = None " "0x01" = HyperV "0x02" = VMWare "0x04" = Virtual PC "0x08" = Xen PC	Flag that indicates the type of virtualization environment reported by the second endpoint.	• Data was not reported by the endpoint
First Endpoint Make	String	Device manufacturer, information is read from an Endpoint Data file EndpointMake field.	• No data file for the endpoint
First Endpoint Model	String	Device model, information is read from an Endpoint Data file EndpointModel field.	• No data file for the endpoint
First Endpoint Type	String	Device type, information is read from an Endpoint Data file EndpointType field.	• No data file for the endpoint
First Endpoint Label 1	String	A customizable label, information is read from an Endpoint Data file .	• No data file for the endpoint
First Endpoint Label 2	String	A customizable label, information is read from an Endpoint Data file.	• No data file for the endpoint
First Endpoint Label 3	String	A customizable label, information is read from an Endpoint Data file.	• No data file for the endpoint
Second Endpoint Make	String	Device manufacturer, information is read from an Endpoint Data file EndpointName field.	• No data file for the endpoint
Second Endpoint Model	String	Device model, information is read from an Endpoint Data file EndpointModel field.	• No data file for the endpoint
Second Endpoint Type	String	Device type, information is read from an Endpoint Data file EndpointType field.	• No data file for the endpoint
Second Endpoint Label 1	String	A customizable label, information is read from an Endpoint Data file.	• No data file for the endpoint
Second Endpoint Label 2	String	A customizable label, information is read from an Endpoint Data file.	• No data file for the endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Endpoint Label 3	String	A customizable label, information is read from an Endpoint Data file.	• No data file for the endpoint
Building			
First Network	String	Subnet used for media stream by the first endpoint if the subnet exists in subnet to tenant building data. **Example value:** 10.0.1.12.0	• Network data was not reported by the endpoint • Network is not defined in subnet-mapping data.
First Network Name	String	Name of network used for media stream by first endpoint. Based on mapping subnet to tenant building data. **Example value:** USA/WA/REDMOND	• Network data was not reported by the endpoint • Network is not defined in subnet-mapping data
First Network Range	String	Network prefix/range of the subnet used for the media stream by the first endpoint, based on data-mapping subnet to tenant building. **Example value:** 24	• Network data was not reported by the endpoint • Network is not defined in subnet-mapping data
First Building Name	String	Name of the building where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** Main	• Network data was not reported by the endpoint • Network is not defined in subnet-mapping data
First Ownership Type	String	Ownership type of the building where the first endpoint was located. Based on mapping subnet to tenant building data. **Example value:** Contoso-IT	• Network data was not reported by the endpoint • Network is not within the corporate network or network ownership is not defined in subnet-mapping data
First Building Type	String	Type of building where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** Open Office	• Network data not reported by the endpoint • Network is not within corporate network • Network building type is not defined in subnet-mapping data

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Building Office Type	String	Type of building where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** Open Office	• Network data not reported by the endpoint • Network is not within corporate network • Network building type is not defined in subnet-mapping data
First City	String	City where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** Redmond	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a city defined in subnet-mapping data
First Zip Code	String	Zip/Postal code where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** 98052	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a zip code defined in subnet-mapping data
First Country	String	Country where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** USA	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a country defined in subnet-mapping data
First State	String	State where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** WA	• Network data was not reported by the endpoint • Network is not within corporate network • Network does not have a State defined in subnet-mapping data.
First Region	String	Region where the first endpoint was located based on mapping subnet to tenant building data. **Example value:** North America	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a region defined in subnet-mapping data.

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Express Route	Boolean	True if the subnet used for the media stream by the first endpoint is enabled for Azure ExpressRoute, based on mapping subnet to tenant building data. You can customize usage for other purposes if you decide to.	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have an ExpressRoute flag set in subnet-mapping data.
Second Network	String	Subnet used for media stream by second endpoint if subnet exists in subnet to tenant building data. **Example value:** 10.0.1.12.0	• Network data not reported by the endpoint • Network is not defined in subnet-mapping data
Second Network Name	String	Name of the network used for the media stream by the second endpoint, based on mapping subnet to tenant building data. **Example value:** USA/ WA/ REDMOND	• Network data not reported by the endpoint • Network does not have a network name defined in subnet-mapping data
Second Network Range	String	Network prefix/range of the subnet used for the media stream by the second endpoint, based on mapping subnet to tenant building data. **Example value:** 24	• Network data not reported by the endpoint • Network does not have a network range defined in subnet-mapping data
Second Building Name	String	Name of the building where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** Main	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a building name defined in subnet-mapping data
Second Ownership Type	String	Ownership type of building where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** Contoso — IT	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have ownership defined in subnet-mapping data
Second Building Type	String	Type of building where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** Open Office	• Network data not reported by the endpoint • Network is not within corporate network • Network building type is not defined in subnet-mapping data

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Building Office Type	String	Office building type where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** Office	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a building office type defined in subnet-mapping data.
Second City	String	City where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** Redmond	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a city defined in subnet-mapping data
Second Zip Code	String	Zip/Postal code where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** 98052	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a zip code defined in subnet-mapping data
Second Country	String	Country where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** USA	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have country defined in subnet-mapping data
Second State	String	State where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** WA	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have a state defined in subnet-mapping data
Second Region	String	Region where the second endpoint was located based on mapping subnet to tenant building data. **Example value:** North America	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have region defined in subnet-mapping data.

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Express Route	Boolean	True if the subnet used for the media stream by the second endpoint is enabled for ExpressRoute, based on mapping subnet to tenant building data.	• Network data not reported by the endpoint • Network is not within corporate network • Network does not have an ExpressRoute flag set in subnet-mapping data
First Inside Corp	Enumeration **Possible values:** Inside, Outside	Indicates if the first endpoint was on a subnet within the corporate network, based on mapping subnet to tenant building data. By default, the endpoint is considered Outside. **Example value:** Inside	
Second Inside Corp	Enumeration **Possible values:** Inside, Outside	Indicates if the second endpoint was on a subnet within the corporate network, based on mapping subnet to tenant building data. By default, the endpoint is considered Outside. **Example value:** Inside	
Deployment			
First Tenant Id	String	Tenant ID for the first endpoint. **Example value:** 00000000 — 0000 -0000 - 0000 — 000000000000	• Tenant id for the first endpoint could not be determined. This may indicate that the endpoint was signed in to an on-premise Skype for Business Server deployment.
Second Tenant Id	String	Tenant ID for the second endpoint. **Example value:** 00000000 — 0000 - 0000 - 0000 — 000000000000	• Tenant id for the second endpoint could not be determined. This may indicate that the endpoint was signed in to an on-premise Skype for Business Server deployment.
First Pool	String	Skype for Business Online pool FQDN assigned to the first endpoint. **Example value:** pool1.lync.com	• Indicates that the endpoint was signed in to a Microsoft Teams or Skype for Business . This field will only be populated for streams using on-premise Skype for Business Server deployments.

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Pool	String	Skype for Business Online pool FQDN assigned to the second endpoint. **Example value:** pool1.lync.com	• Skype for Business Online pool could not be determined for the second endpoint. This may indicate that the endpoint was signed in to an on-premise Skype for Business Server deployment.
Is Federated	Boolean	True if streams were between two federated tenants, False otherwise.	• It could not be determined if this was a federated stream • Some signaling data was not collected
Region	String	Region where the deployment was located based on the home region of the tenant. **Example value:** North America	• Network data not reported • Network is not within corporate network • Network does not have region defined in subnet-mapping data.
Stream			
QoE Record Available	Boolean	True if at least one Quality of Experience report was available for call/session. Many dimensions and measurements are available only if a QoE record was available. If the call setup fails, a QoE record will not be available.	
CDR Record Available	Boolean	True if at least one Call Detail Records was available for call/session.	
Media Line Label	Integer	Label in SDP for media line. Use Media Type to determine if label is used for video, audio, app sharing, or video based screen sharing. **Example value:** 0	• This data was not reported by the endpoint.
Media Type	String	Type of media (video, audio, app sharing, or video based screen sharing). **Example value:** Audio	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Media Line Label Text	String	The Session Description Protocol (SDP) Label Attribute of the media line corresponding to the stream. See RFC 4574 for more detailed info. **Example values**: main-audio main-video main-video1 main-video2 main-video3 main-video4 main-video5 main-video6 main-video7 main-video8 main-video9 panoramic-video applicationsharing-video data	
First Is Server	Enumeration **Possible values:** • Client • Server	Indicates if the first endpoint is a server endpoint such as a conferencing server (AVMCU, ASMCU) or other media servers (Mediation Server), or is a client endpoint. **Example value:** Client	
Second Is Server	Enumeration **Possible values:** • Client • Server	Indicates if the second endpoint is a server endpoint, or is a client endpoint. **Example value:** Client	
First Is Caller	Boolean	True if the first endpoint was the caller who initiated the session.	
First Network Connection Detail	Enumeration **Possible values:** • Wired • WiFi • MobileBB • Tunnel • Other	Type of network used by the first endpoint. **Example value:** Wired	• Data was not reported by the endpoint
Second Network Connection Detail	Enumeration **Possible values:** • Wired • WiFi • MobileBB • Tunnel • Other	Type of network used by the second endpoint. **Example value:** Wired	• Data was not reported by the endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Stream Direction	Enumeration **Possible values:** • First-to-Second • Second-to-First	Indicates the direction of a stream. • **Example value:** First-to-Second	• No data was reported to indicate the direction of the stream
Payload Description	String	Name of last codec used in the stream. **Example value:** SILKWide	• No data is available
Audio and Video Call	Boolean	True if call had both audio and video streams, False otherwise	• No data was reported to indicate the media types of the stream.
Duration 5 seconds or less	Boolean	True if stream had duration of 5 seconds or less, False otherwise.	
Duration 60 seconds or more	Boolean	True if stream had duration of 60 seconds of more, False otherwise.	
Is Teams	Boolean	True indicates that the first or second user agent for the stream is a Microsoft Teams endpoint. False indicates that the user agents are Skype for Business endpoints.	
Duration (Minutes)	Range (minutes)	Duration of stream in minutes. Values grouped by range. **Example value:** 065: [3–4)	
Duration (Seconds)	Range (seconds)	Duration of stream in seconds. Values grouped by range. **Example value:** 062: [1 -2)	
Date			
End Time	String	Time of day the call ended.	• Call setup failed
Year	Integer	Year of the end of the stream. Values are reported in the UTC time zone. **Example value:** 2018	
Month	Integer	Month of the end of the stream. Values are reported in the UTC time zone. **Example value:** 2	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Day	Integer	Day of the end of the stream. Values are reported in the UTC time zone. **Example value:** 1	
Date	String	Date the stream ended. Values are reported in the UTC time zone. **Example value:** 2018-06-01	
Hour	Integer	Hour of the end of the stream. Values are reported in the UTC time zone. **Example value:** 1	
Minute	Integer	Minute of the end of the stream. Values are reported in the UTC time zone. **Example value:** 30	
Second	Integer	Second of the end of the stream. Values are reported in the UTC time zone. **Example value:** 12	
Day Of Year	Integer	Day of year of the end of the stream. Values are reported in the UTC time zone. **Example value:** 32	
Day Of Week	String	Day of week of the end of the stream. Values are reported in the UTC time zone. **Example value:** Wednesday	
Day Number Of Week	Integer	Day number of week of the end of the stream. Values are reported in the UTC time zone. **Example value:** 3	
Week	String	Starting date of the week in which the call took place. **Example value:** 2019-09-01	• Call setup failed
Month Year	String	Month and year of the end of the stream. Values are reported in the UTC time zone. **Example value:** 2017-02	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Full Month	Date time	Full Month of the end of the stream. Values are reported in the UTC time zone. **Example value:** 2017-02-01T00:00:00	
Start time	String	Time of day the call started.	• Call setup failed
UserAgent			
First Domain	String	Domain of the first endpoint's user. If the first endpoint is a conference server, it uses the domain of the organizer of the meeting. May also be the domain of service accounts used in scenario. **Example value:** contoso.com	
Second Domain	String	Domain of the second endpoint's user. If the second endpoint is a conference server, it uses the domain of the organizer of the meeting. May also be the domain of service accounts used in scenario. **Example value:** contoso.com	
First User Agent Category	String	Category of the user agent of the first endpoint. **Example value:** OC	• A user agent does not currently have a mapping
Second User Agent Category	String	Category of the user agent of the second endpoint. **Example value:** OC	• A user agent does not currently have a mapping
First User Agent	String	User agent string of the first endpoint. **Example value:** UCCAPI/16.0.7766.5281 OC/16.0.7766.2047 (Skype for Business)	• No user agent reported by first endpoint
Second User Agent	String	User agent string of the second endpoint. **Example value:** UCCAPI/16.0.7766.5281 OC/16.0.7766.2047 (Skype for Business)	• No user agent was reported by second endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Conference Type	Enumeration **Possible values:** • conf:applicationsharing • conf:audio-video • conf:focus	Type of conference URI. **Example value:** conf:audio-video	• Non-conference scenario.
Conference ID	String	Conference ID (or Call ID) associated with the streams. In cqd.teams.microsoft.com, all calls have a call ID regardless of whether they are a person-to-person (P2P) call or a conference call. This dimension may have too many rows to be used as dimension in a report. It can be used a filter instead. **Example value (cqd.teams.microsoft.com):** 5a962ccf-b9cb-436a-a433-f28bf5404ad8	
First Client App Version	String	Version of the application used for the first endpoint. Data is parsed from the user agent string. **Example value:** 16.0.7766.2047	• The version string could not be parsed • The value was not reported.
Second Client App Version	String	Version of the application used for the second endpoint. Data is parsed from the user agent string. **Example value:** 16.0.7766.2047	• The version string could not be parsed • The value was not reported.
Meeting Id	String	The identifier for the meeting, generated when the meeting was created. **Example value:** 19:meeting_MzB...zIw@thread.v2	
Network			
Transport	Enumeration **Possible values:** • UDP • TCP • Unrecognized	Network transport type used by stream. Unrecognized indicates that the system could not determine if the transport type was TCP or UDP.	• Transport type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Connectivity Ice	Enumeration **Possible values:** • DIRECT= Direct network path • RELAY = through relay • HTTP = through HTTP proxy • FAILED = connectivity failed	ICE connectivity type used by the first endpoint.	• Transport type was not reported • The media path was not established
Second Connectivity Ice	Enumeration **Possible values:** • DIRECT= Direct network path • RELAY = through relay • HTTP = through HTTP proxy • FAILED = connectivity failed	ICE connectivity type used by the second endpoint.	• Transport type was not reported • The media path was not established
First IP Address	String	IP address for first endpoint. Note this dimension may have too many rows to be used as dimension in a report. It can be used as a filter instead. **Example value:** 10.0.0.10	• Transport type was not reported • The media path was not established
Second IP Address	String	IP address for second endpoint. **Note:** This dimension may have too many rows to be used as dimension in a report. It can be used as a filter instead. **Example value:** 10.0.0.10	• Transport type was not reported • The media path was not established
First Link Speed	Integer	Link speed in bits per second reported by the network adapter used by the first endpoint. **Example value:** 10000000	• Transport type was not reported • The media path was not established
Second Link Speed	Integer	Link speed in bits per second reported by the network adapter used by the second endpoint. **Example value:** 10000000	• Transport type was not reported • The media path was not established
First Port	Port number	Network port number used by first endpoint for media. **Example value:** 50018	• Transport type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Port	Port number	Network port number used by second endpoint for media. **Example value:** 50018	• Transport type was not reported • The media path was not established
First Reflexive Local IP	String	IP address of first endpoint as seen by the media relay server. This is typically the public internet IP address associated to the first endpoint for the stream. **Example value:** 104.43.195.251	• Transport type was not reported • The media path was not established
Second Reflexive Local IP	String	IP address of second endpoint as seen by the media relay server. This is typically the public internet IP address associated to the second endpoint for the stream. **Example value:** 104.43.195.251	• Transport type was not reported • The media path was not established
First Relay IP	String	IP address of the media relay server allocated by the first endpoint. **Example value:** 104.43.195.251	• Transport type was not reported • The media path was not established
Second Relay IP	String	IP address of the media relay server allocated by the second endpoint. **Example value:** 104.43.195.251	• Transport type was not reported • The media path was not established
First Relay Port	Integer	Media port allocated on the media relay server by the first endpoint. **Example value:** 3478	• Transport type was not reported • The media path was not established
Second Relay Port	Integer	Media port allocated on the media relay server by the second endpoint. **Example value:** 3478	• Transport type was not reported • The media path was not established
First Subnet	String	Subnet used for media stream by first endpoint with dashes separating each octet. **Example value:** 104.43.195.0	•Data not reported by the endpoint • Media path was not established • IPv6 was used

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Subnet	String	Subnet used for media stream by second endpoint with dashes separating each octet. **Example value:** 104.43.195.0	•Data not reported by the endpoint • Media path was not established • IPv6 was used
First VPN	Boolean	True if the network adapter used by first endpoint indicated it was a VPN connection, False otherwise. Some VPN's do not correctly report this data correctly.	• Transport type was not reported • The media path was not established
Second VPN	Boolean	True if the network adapter used by second endpoint indicated it was a VPN connection, False otherwise. Some VPN's do not correctly report this data correctly.	• Transport type was not reported • The media path was not established
Applied Bandwidth Source	Enumeration **Possible values:** • Static Max • API Modality • API Modality_All • API SendSide BWLimit • Preference Value • TURN • ReceiveSide TURN • API SDP Modality • Remote Received • Side BWLimit • API ServiceQuality • API SDP • Receive SidePDP	Identifies the source of bandwidth applied to the stream.	• Transport type was not reported • The media path was not established
Bandwidth Est	Integer Range	Average estimated bandwidth available between first and second endpoint in bits per second. **Example value:** 026: [260000 - 270000)	• Transport type was not reported • The media path was not established
Mediation Server Bypass Flag	Boolean	True if the media stream bypassed the Mediation Server and went straight between client and PSTN Gateway/PBX, False otherwise.	• Transport type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First CDR Connectivity Type	Enumeration **Possible values:** • OS • PeerDerived • Stun • Turn	Identifies the ICE connectivity path selected by the first endpoint for use for this stream. **Example value:** OS	• Transport type was not reported • The media path was not established
Second CDR Connectivity Type	Enumeration **Possible values:** • OS • PeerDerived • Stun • Turn	Identifies the ICE connectivity path selected by the second endpoint for use for this stream. **Example value:** OS	• Transport type was not reported • The media path was not established
First BSSID	String	The Wireless LAN basic service set identifier of the First endpoint used to connect to the network.	
Second BSSID	String	The Wireless LAN basic service set identifier of the Second endpoint used to connect to the network.	
First Base Address	String	IP address of the interface that the first endpoint used for allocating media relay candidates. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 10.0.0.10	• Transport Diagnostic type was not reported • The media path was not established
Second Base Address	String	IP address of the interface that the second endpoint used for allocating media relay candidates. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 10.0.0.10	• Transport Diagnostic type was not reported • The media path was not established
First Local Address	String	IP address that the first endpoint used for media flow at the end of media connectivity checks. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 10.0.0.10	• Transport Diagnostic type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Local Address	String	IP address that the second endpoint used for media flow at the end of media connectivity checks. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 10.0.0.10	• Transport Diagnostic type was not reported • The media path was not established
First Local Address Type	Enumeration **Possible Values** •IceAddrType_Os •IceAddrType_Stun •IceAddrType_Turn •IceAddrType_UPnP •IceAddrType_ISA_Proxy •IceAddrType_PeerDerived •IceAddrType_Invalid	The candidate type of First Local Address. IceAddrType_Turn indicates a relayed call. The rest of the types indicate direct connections.	• Transport Diagnostic type was not reported • The media path was not established
Second Local Address Type	Enumeration **Possible Values** •IceAddrType_Os •IceAddrType_Stun •IceAddrType_Turn •IceAddrType_UPnP •IceAddrType_ISA_Proxy •IceAddrType_PeerDerived •IceAddrType_Invalid	The candidate type of Second Local Address. IceAddrType_Turn indicates a relayed call. The rest of the types indicate direct connections.	• Transport Diagnostic type was not reported • The media path was not established
First Remote Address	String	IP Address of the second endpoint to which the first endpoint will send media to at the end of media connectivity checks. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 10.0.0.10	• Transport Diagnostic type was not reported • The media path was not established
Second Remote Address	String	IP Address of the first endpoint to which the second endpoint will send media to at the end of media connectivity checks. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 10.0.0.10	• Transport Diagnostic type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Remote Address Type	Enumeration **Possible Values** •IceAddrType_Os •IceAddrType_Stun •IceAddrType_Turn •IceAddrType_UPnP •IceAddrType_ISA_Proxy •IceAddrType_PeerDerived •IceAddrType_Invalid	Candidate type of First Remote Address. IceAddrType_Turn indicates a relayed call. The rest of the values indicate direct connections.	• Transport Diagnostic type was not reported • The media path was not established
Second Remote Address Type	Enumeration **Possible Values** •IceAddrType_Os •IceAddrType_Stun •IceAddrType_Turn •IceAddrType_UPnP •IceAddrType_ISA_Proxy •IceAddrType_PeerDerived •IceAddrType_Invalid	Candidate type of Second Remote Address. IceAddrType_Turn indicates a relayed call. The rest of the values indicate direct connections.	• Transport Diagnostic type was not reported • The media path was not established
First Local Site	String	IP address of the first endpoint as seen by the media relay server. This is typically the public internet IP address associated with the first endpoint for the stream. If for some reason the relays are not reachable or allocations failed, this will be the IP of a local interface on the first endpoint. This is similar to First Reflexive Local IP, but this information is reported by the Transport Diagnostic event instead of QoE. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 104.43.195.251	• Transport Diagnostic type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Local Site	String	IP Address of the second endpoint as seen by the media relay server. This is typically the public internet IP address associated with the second endpoint for the stream. If for some reason the relays are not reachable or allocations failed, this will be the IP of a local interface on the first endpoint. This is similar to Second Reflexive Local IP, but this information is reported by the Transport Diagnostic event instead of QoE. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 104.43.195.251	• Transport Diagnostic type was not reported • The media path was not established
First Remote Site	String	The Local Site IP address reported by the second endpoint and exchanged with the first endpoint. Extra information in case Transport Diagnostic event on the second endpoint is not available for any reason. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 104.43.195.251	• Transport Diagnostic type was not reported • The media path was not established
Second Remote Site	String	The Local Site IP address reported by the first endpoint and exchanged with the second endpoint. Extra information in case the Transport Diagnostic event on the first endpoint is not available for any reason. Only available for the past 28 days of data and only visible to users with roles allowing EUII access. **Example value:** 104.43.195.251	• Transport Diagnostic type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Local Media Relay Address	String	Microsoft IP address of the media relay server allocated by the first endpoint. This is similar information to First Relay IP, but is reported by the Transport Diagnostic event instead of QoE. **Example value:** 52.114.5.237	• Transport Diagnostic type was not reported • The media path was not established
Second Local Media Relay Address	String	Microsoft IP address of the media relay server allocated by the second endpoint. This is similar information to Second Relay IP, but is reported by the Transport Diagnostic event instead of QoE. **Example value:** 52.114.5.237	• Transport Diagnostic type was not reported • The media path was not established
First Remote Media Relay Address	String	Microsoft IP address of the media relay server allocated by the second endpoint and exchanged with the first endpoint. Extra information in case the Transport Diagnostic event on the second endpoint is not available for any reason. **Example value:** 52.114.5.237	• Transport Diagnostic type was not reported • The media path was not established
Second Remote Media Relay Address	String	Microsoft IP address of the media relay server allocated by the first endpoint and exchanged with the second endpoint. Extra information in case the Transport Diagnostic event on the first endpoint is not available for any reason. **Example value:** 52.114.5.237	• Transport Diagnostic type was not reported • The media path was not established

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Transport Protocol	Enumeration string	The communications protocol used by the first endpoint for sending media. **Possible Values** •UDP - Multi-purpose UDP used for both TURN and host allocations •TurnTCP - TCP TURN allocation. Uses the proxy if proxy settings are specified •TCPHostPassive - TCP listen host socket for a passive connection type •TCPHostActive - TCP connection using an active connection type •CompoundTCP - A combination of upstream and downstream TCP connections. Typically over the HTTPS protocol.	• Transport Diagnostic type was not reported • The media path was not established
Second Transport Protocol	Enumeration string	The communications protocol used by the second endpoint for sending media. **Possible Values** •UDP - Multi-purpose UDP used for both TURN and host allocations •TurnTCP - TCP TURN allocation. Uses the proxy if proxy settings are specified •TCPHostPassive - TCP listen host socket for a passive connection type •TCPHostActive - TCP connection using an active connection type •CompoundTCP - A combination of upstream and downstream TCP connections. Typically over the HTTPS protocol.	• Transport Diagnostic type was not reported • The media path was not established
Device			

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Capture Dev	String	Name of the capture device used by the first endpoint. For: **Audio streams** = device used for the microphone **Video streams** = device used for the camera **Video-based-screen-sharing streams** = screen scraper **App sharing streams** = blank **Example value:** Headset Microphone (Microsoft LifeChat LX-6000)	• The data was not reported by the endpoint • The media path was not established • The stream was video-based screen sharing or application sharing.
Second Capture Dev	String	Name of the capture device used by the second endpoint. **Audio streams** = device used for the microphone **Video streams** = device used for the camera **Video-based-screen-sharing streams** = screen scraper **App sharing streams** = blank **Example value:** Headset Microphone (Microsoft LifeChat LX-6000)	• Data was not reported by the endpoint • Media path was not established • The stream was video-based screen sharing or application sharing
First Capture Dev Driver	String	Name of the capture device driver used by the first endpoint in the form of "manufacturer : version". For: **Audio streams** = driver used for the microphone **Video streams** = driver used for the camera **Video-based-screen-sharing and app sharing streams** = blank **Example value:** Microsoft: 10.0.14393.0	• Data was not reported by the endpoint • The media path was not established • The stream was video-based screen sharing or application sharing.

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Capture Dev Driver	String	Name of the capture device driver used by the second endpoint in the form of "manufacturer : version". For: **Audio streams** = driver used for the microphone **Video streams** = driver used for the camera **Video-based-screen-sharing and app sharing streams** = blank **Example value:** Microsoft: 10.0.14393.0	• Data was not reported by the endpoint • The media path was not established • The stream was video-based screen sharing or application sharing.
First Render Dev	String	Name of the render device used by the first endpoint. For: Audio streams - device used for the speaker Video and video-based-screen-sharing streams - device used for the display App sharing streams - blank **Example value:** Headset Earphone (Microsoft LifeChat LX-6000)	• This data not reported by the endpoint • The media path was not established • The stream was application sharing
Second Render Dev	String	Name of the render device used by the second endpoint. For: Audio streams - device used for the speaker Video and video-based-screen-sharing streams - device used for the display App sharing streams - blank **Example value:** Headset Earphone (Microsoft LifeChat LX-6000)	• This data was not reported by the endpoint, • Media path was not established • The stream was application sharing
First Render Dev Driver	String	Name of the render device driver used by the first endpoint. For: Audio streams - driver used for the speaker Video and video-based-screen-sharing streams - driver used for the display App sharing streams - blank **Example value:** Microsoft: 10.0.14393.0	• This data was not reported by the endpoint • Media path was not established • The stream was application sharing

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Render Dev Driver	String	Name of the render device driver used by the second endpoint. For: Audio streams - driver used for the speaker Video and video-based-screen-sharing streams - driver used for the display App sharing streams - blank **Example value:** Microsoft: 10.0.14393.0	• This data was not reported by the endpoint • Media path was not established • The stream was application sharing
WiFi			
First Wi-Fi Microsoft Driver	String	Name of Microsoft WiFi driver used reported by the first endpoint. Value may be localized based on the language used by endpoint. **Example value:** Microsoft Hosted Network Virtual Adapter	• WiFi wasn't used by the endpoint • The driver information was not reported
Second Wi-Fi Microsoft Driver	String	Name of Microsoft WiFi driver used reported by the second endpoint. Value may be localized based on the language used by endpoint. **Example value:** Microsoft Hosted Network Virtual Adapter	• WiFi wasn't used by the endpoint • The driver information was not reported
First Wi-Fi Vendor Driver	String	Vendor and name of WiFi driver reported by the first endpoint. **Example value:** Contoso Dual Band Wireless-AC Driver	• WiFi wasn't used by the endpoint • The driver information was not reported
Second Wi-Fi Vendor Driver	String	Vendor and name of WiFi driver reported by the second endpoint. **Example value:** Contoso Dual Band Wireless-AC Driver	• WiFi wasn't used by the endpoint • The driver information was not reported
First Wi-Fi Microsoft Driver Version	String	Version of Microsoft WiFi driver reported by the first endpoint. **Example value:** Microsoft:10.0.14393.0	• WiFi wasn't used by the endpoint • The driver information was not reported
Second Wi-Fi Microsoft Driver Version	String	Version of Microsoft WiFi driver reported by the second endpoint. **Example value:** Microsoft:10.0.14393.0	• WiFi wasn't used by the endpoint • The driver information was not reported

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Wi-Fi Vendor Driver Version	String	Vendor and version of WiFi driver reported by the first endpoint. **Example value:** Contoso:15.1.1.0	• WiFi wasn't used by the endpoint • The driver information was not reported
Second Wi-Fi Vendor Driver Version	String	Vendor and version of WiFi driver reported by the second endpoint. **Example value:** Contoso:15.1.1.0	• WiFi wasn't used by the endpoint • The driver information was not reported
First Wi-Fi Channel	String	WiFi channel used by the first endpoint. **Example value:** 10	• WiFi was not used • The channel was not reported
Second Wi-Fi Channel	String	WiFi channel used by the second endpoint. **Example value:** 10	• WiFi was not used • The channel was not reported
First Wi-Fi Radio Type	String	Type of WiFi radio used by the first endpoint. HRDSSS is equivalent to 802.11b. **Example value:** 802.11ac	• WiFi was not used • The WiFi type was not reported
Second Wi-Fi Radio Type	String	Type of WiFi radio used by the second endpoint. HRDSSS is equivalent to 802.11b. **Example value:** 802.11ac	• WiFi was not used • The WiFi type was not reported
First DNS Suffix	String	DNS suffix associated with the network adapter reported by the first endpoint. Note this value may be reported for any type of network adapter. **Example value:** corp.contoso.com	• This value was not reported by the endpoint
Second DNS Suffix	String	DNS suffix associated with the network adapter reported by the second endpoint. Note this value may be reported for any type of network adapter. **Example value:** corp.contoso.com	• This value was not reported by the endpoint
First Wi-Fi Band	String	WiFi band used as reported by the first endpoint. **Example value:** 5.0 Ghz	• The value was not computed by the endpoint • The value was not reported

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Wi-Fi Band	String	WiFi band used as reported by the second endpoint. **Example value:** 5.0 Ghz	• The value was not computed by the endpoint • The value was not reported
First Wi-Fi Signal Strength	String	WiFi signal strength in percentage [0-100] reported by the first endpoint. **Example value:** 081: [90 - 100)	• The value was not computed by the endpoint • The value was not reported
Second Wi-Fi Signal Strength	String	WiFi signal strength in percentage [0-100] reported by the second endpoint. **Example value:** 081: [90 - 100)	• The value was not computed by the endpoint • The value was not reported
First Wi-Fi Battery Charge	Range (percentage)	Estimated remaining battery charge in percentage [0-99] reported by the first endpoint. Values grouped by range. 0 indicates that the device was plugged in. **Example value:** 081: [90 - 100)	• WiFi was not used • The charge value was not reported
Second Wi-Fi Battery Charge	Range (percentage)	Estimated remaining battery charge in percentage [0-99] reported by the second endpoint. Values grouped by range. 0 indicates that the device was plugged in. **Example value:** 081: [90 - 100)	• WiFi was not used • The charge value was not reported
Metrics			
Audio Degradation Avg	Range (Mean opinion score 0-5)	Average Network Mean Opinion Score degradation for stream. Represents how much the network loss and jitter have impacted the quality of received audio. Values grouped by range. **Example value:** 015: [0.01 - 0.02)	• No network MOS degradation was reported by the endpoint receiving the stream • The stream is not an audio stream.
Jitter	Range (millisecond)	Average jitter for stream in milliseconds. Values grouped by range. **Example value:** 065: [2 - 3)	• No jitter data was reported by the endpoint receiving the stream

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Jitter Max	Range (millisecond)	Maximum jitter for stream in milliseconds. Values grouped by range. **Example value:** 065: [2 - 3)	• No jitter data was reported by the endpoint receiving the stream
Packet Loss Rate	Range (ratio)	Average packet loss rate for stream. Values grouped by range. 0.1 indicates 10% packet loss. **Example value:** 015: [0.01 - 0.02)	• No packet loss data was reported by the endpoint receiving the stream
Packet Loss Rate Max	Range (ratio)	Maximum packet loss rate for stream. Values grouped by range. 0.1 indicates 10% packet loss. **Example value:** 023: [0.09 - 0.1)	• No packet loss data was reported by the endpoint receiving the stream
Overall Avg Network MOS	Range (MOS)	Average Network MOS for stream. Values grouped by range. **Example value:** 076: [4.4 - 4.5)	• No network MOS degradation was reported by the endpoint receiving the stream • The stream is not an audio stream
Ratio Concealed Samples Avg	Range (ratio)	Ratio of the number of audio frames with samples generated by packet loss concealment to the total number of audio frames. Values grouped by range. 0.1 indicates 10% of frames contained concealed samples. **Example value:** 015: [0.01 - 0.02)	• This value was not reported by the receiver of the stream • The stream was not an audio stream
Conceal Ratio Max	Range (ratio)	The maximum seen number of audio frames with samples generated by packet loss concealment to the total number of audio frames. Values grouped by range. 0.1 indicates 10% of frames contained concealed samples. **Example value:** 015: [0.01 - 0.02)	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Ratio Stretched Samples Avg	Range (ratio)	Ratio of the number of audio frames with samples that have been stretched to compensate for jitter or loss to the total number of audio frames. Values grouped by range. 0.1 indicates 10% audio frames contained stretched samples. **Example value:** 017: [0.03 - 0.04)	• This value was not reported by the receiver of the stream • The stream was not an audio stream
Healer Packet Drop Ratio	Range (ratio)	Ratio of audio packets dropped by healer over total number of audio packets received by healer. See 2.2.1.12.1 Child Elements for more information.	
Healer FEC Packet Used Ratio	Range (ratio)	Ratio of used Forward Error Correction (FEC) packets over total number of received FEC packets. See 2.2.1.12.1 Child Elements for more information.	
Round Trip	Range (milliseconds)	Average network propagation round-trip time computed as specified in RFC3550 in milliseconds. Values grouped by range. **Example value:** 070: [15 - 20)	• The value was not computed by the endpoint • The value was not reported
Round Trip Max	Range (milliseconds)	Maximum network propagation round-trip time computed as specified in RFC3550 in milliseconds. Values grouped by range. **Example value:** 098: [350 - 375)	• The value was not computed by the endpoint • The value was not reported
Packet Utilization	Number (Packets)	Number of Real-Time Transport Protocol (RTP) packets sent in the session.	
Jitter Buffer Size Avg	Number (Range)	Average size of jitter buffer during session.	
Jitter Buffer Size Max	Number (Range)	Maximum size of jitter buffer during session.	
Jitter Buffer Size Min	Number (Range)	Minimum size of jitter buffer during session.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Relative OneWay Gap Duration	Duration of gaps in the relative one way delay of the peer.		
Audio Post FECPLR	Number	Reports packet loss rate after FEC has been applied for audio. Value between 0.00 and 1.00.	
Network Jitter Avg	Range (milliseconds)	Average of network jitter in milliseconds computed over 20 second windows during the session. Values grouped by range. **Example value:** 066: [3–4)	• The stream was not an audio stream • Data was not reported by the endpoint receiving the stream
Network Jitter Max	Number of events	Maximum of network jitter computed over 20 second windows during the session.	
Network Jitter Min	Number of events	Minimum of network jitter computed over 20 second window during the session.	
Video Post FECPLR	Range (ratio)	Packet loss rate after FEC has been applied for aggregated across all video streams and codecs. Values grouped by range. **Example value:** 014: [0 - 0.01)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream
Video Local Frame Loss Percentage Avg	Range (percentage)	Average percentage of video frames lost as displayed to the user. Values grouped by range. This includes frames recovered from network losses. **Example value:** 160: [80 - 85)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream
Received Frame Rate Average	Range (frames per second)	Average frames per second received for all video streams computed over the duration of the session. Values grouped by range. **Example value:** 101: [14.5 - 15)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream
Low Frame Rate Call Percent	Range (percentage)	Percentage of time of the call where frame rate is less than 7.5 frames per second. Values grouped by range. **Example value:** 099: [13.5 - 14)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Video Packet Loss Rate	Range (ratio)	Average fraction of packets lost, as specified in RFC3550, computed over the duration of the session. Values grouped by range. **Example value:** 037: [0.75 - 0.8)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream
Video Frame Rate Avg	Range (frames per second)	Average frames per second received for a video stream, computed over the duration of the session. Values grouped by range. **Example value:** 135: [31.5 - 32)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream
Dynamic Capability Percent	Range (percentage)	Percentage of time that the client is running < 70% expected video processing capability for this type of CPU grouped by range **Example value:** 122: [25 - 25.5)	• The stream was not a video or video-based-screen-sharing stream • Data was not reported by the endpoint receiving the stream
Spoiled Tile Percent Total	Range (percentage)	Percentage of tiles which are discarded instead of being sent to a remote peer (for example, from the MCU to a viewer). Values grouped by range. Discarded tiles may be caused by bandwidth restrictions between client and server. **Example value:** 140: [34 - 34.5)	• The stream was not an application sharing stream • The data was not reported by the endpoint sending the stream
AppSharing Relative OneWay Average	Range (seconds)	Average relative one-way delay between the endpoints in seconds for application sharing streams. Values grouped by range. **Example value:** 015: [0.01 - 0.02)	• The stream was not an application sharing stream • The data was not reported by the endpoint sending the stream
AppSharing RDP Tile Processing Latency Average	Range (milliseconds)	Average latency in milliseconds processing tiles on the RDP Stack at the conferencing server. Values grouped by range. **Example value:** 103: [15.5 - 16)	• The stream was not an application sharing stream in a conference • The data was not reported by the endpoint sending the stream

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Network Delay Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the network delay was significant enough to impact the ability to have real-time two-way communication. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Network Delay Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the network delay was significant enough to impact the ability to have real-time two-way communication. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Network Bandwidth Low Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the available bandwidth or bandwidth policy was low enough to cause poor quality of the audio sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Network Bandwidth Low Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the available bandwidth or bandwidth policy was low enough to cause poor quality of the audio sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Mic Glitch Rate	Number	Average glitches per 5 minutes for the microphone capture of the first endpoint. See 2.2.1.12.1 Child Elements for more information.	
Second Mic Glitch Rate	Number	Average glitches per 5 minutes for the microphone capture of the second endpoint. See 2.2.1.12.1 Child Elements for more information.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Speaker Glitch Rate	Number of events	Average glitches per 5 minutes for the first loudspeaker rendering.	
Second Speaker Glitch Rate	Number of events	Average glitches per 5 minutes for the second loudspeaker rendering.	
Audio			
Audio FEC Used	Boolean	True indicates that audio forward error correction (FEC) was used at some point during the call. False otherwise	• The stream was not an audio stream • The data was not reported by the endpoint sending the stream
Measure			
ClassifiedPoorCall	Boolean	True if the stream was classified as poor based on the metrics listed in Stream Classification in Call Quality Dashboard.	• The stream did not have sufficient metrics reported to be classified as good or poor
Video Poor Due To VideoPostFecplr	Boolean	True if the stream was classified as poor based on the Video Post FEC PLR metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-video streams.	• The endpoint did not report this data • The stream was not a video stream.
Video Poor Due To VideoLocalFrameLossPercentageAvg	Boolean	True if the video stream was classified as poor based on the Video Local Frame Loss Percentage Avg metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-video streams.	• The endpoint did not report this data • The stream was not a video stream.
Video Poor Due To VideoFrameRateAvg	Boolean	True if the video stream was classified as poor based on the Video Frame Rate Avg metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-video streams.	• The endpoint did not report this data • The stream was not a video stream

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
VBSS Poor Due To VideoPostFecplr	Boolean	True if the video based-screen-sharing stream was classified as poor based on the Video Post FEC PLR metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-video based-screen-sharing streams.	• The endpoint did not report this data • The stream was not a video-based screen sharing stream
VBSS Poor Due To VideoLocalFrameLossPercentageAvg	Boolean	True if the video based-screen-sharing stream was classified as poor based on the Video Local Frame Loss Percentage Avg metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-video based-screen-sharing streams.	• The endpoint did not report this data • The stream was not a video-based screen sharing stream
Video Poor Due To Freeze	Boolean	1 if the video stream was classified as poor based on the Video Freeze instance : Stream Classification in Call Quality Dashboard	• The endpoint did not report this data • The stream was not a video stream. This field is specific to Microsoft Teams only.
VBSS Poor Due To VideoFrameRateAvg	Boolean	True if the video based-screen-sharing stream was classified as poor based on the Video Frame Rate Avg metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-video based-screen-sharing streams.	• The endpoint did not report this data • The stream was not a video-based screen sharing stream
AppSharing Poor Due To SpoiledTilePercentTotal	Boolean	True if the application sharing stream was classified as poor based on the Spoiled Tile Percent Total metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-application sharing streams.	• The endpoint did not report this data • The stream was not an application sharing stream.

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
AppSharing Poor Due To RelativeOneWayAverage	Boolean	True if the application sharing stream was classified as poor based on the Relative One Way Average metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-application sharing streams.	• The endpoint did not report this data • The stream was not an application sharing stream
AppSharing Poor Due To RDPTileProcessingLatencyAverage	Boolean	True if the application sharing stream was classified as poor based on the RDP Tile Processing Latency Average metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-application sharing streams.	• The endpoint did not report this data • The stream was not an application sharing stream
Audio Poor Due To Jitter	Boolean	True if the audio stream was classified as poor based on the Jitter metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-audio streams.	• The endpoint did not report this data • The stream was not an audio sharing stream
Audio Poor Due To RoundTrip	Boolean	True if the audio stream was classified as poor based on the Round Trip metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-audio streams.	• The endpoint did not report this data • The stream was not an audio sharing stream
Audio Poor Due To Packet Loss	Boolean	True if the audio stream was classified as poor based on the Packet Loss metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-audio streams.	• The endpoint did not report this data • The stream was not an audio sharing stream
Audio Poor Due To Degradation	Boolean	True if the audio stream was classified as poor based on the Degradation metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-audio streams.	• The endpoint did not report this data • The stream was not an audio sharing stream

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Audio Poor Due To Concealed Ratio	Boolean	True if the audio stream was classified as poor based on the Concealed Ratio metric threshold listed here: Stream Classification in Call Quality Dashboard. Will always be False for non-audio streams.	• The endpoint did not report this data • The stream was not an audio sharing stream
Poor Reason	Flags **Possible values:** • Concealed Ratio • Degradation • Jitter • Packet Loss • Round Trip Video Frame Rate Avg Video Local Frame Loss Percentage Avg • Video Post FEC PLR • RDP Tile Processing Latency Average • Relative OneWay Average • Spoiled Tile Percent Total	List of flags that identify why the stream was marked as poor. There may be multiple flags set since there may be multiple reasons why the stream was marked as Poor. Refer to Stream Classification in Call Quality Dashboard for details.	• The stream was not classified as poor
Poor	Boolean	True if the stream has sufficient data to be classified as good or poor and stream is classified as poor. False otherwise.	
Good	Boolean	True if the stream has sufficient data to be classified as good or poor and stream is classified as good. False otherwise.	
Unclassified	Boolean	False if the stream has sufficient data to be classified as good or poor. True otherwise. **Example value:** 1	
OnePercent PacketLoss	Boolean	True if packet loss exceeded 1%, False otherwise.	
Rating			
First Feedback Rating	User rating (1-5)	Rating of the call associated with the stream by the first endpoint on 1-5 scale (5 = excellent). 0 indicates the user was shown the call rating survey but did not rate their experience. **Example value:** 5	• No survey was shown to the first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Feedback Rating	User rating (1-5)	Rating of the call associated with the stream by the second endpoint on 1-5 scale (5 = excellent). 0 indicates the user was shown the call rating survey but did not rate their experience. **Example value:** 5	• No survey was shown to the second endpoint
First Feedback Tokens	String	String containing list of feedback tokens with boolean flag that indicates if token was set by the user providing feedback from the first endpoint. **Example value:** {DistortedSpeech:1; ElectronicFeedback:1; BackgroundNoise:1; MuffledSpeech:1; Echo:1;}	• No feedback was provided by the user of the first endpoint
Second Feedback Tokens	String	String containing list of feedback tokens with boolean flag that indicates if token was set by the user providing feedback from the second endpoint. **Example value:** {DistortedSpeech:1; ElectronicFeedback:1; BackgroundNoise:1; MuffledSpeech:1; Echo:1;}	• No feedback was provided by the user of the second endpoint
First Feedback Has Audio Issue	Boolean	True if feedback tokens from first endpoint indicate stream had an audio issue, false otherwise.	
Second Feedback Has Audio Issue	Boolean	True if feedback tokens from second endpoint indicate stream had an audio issue, False otherwise.	
First Feedback Has Video Issue	Boolean	True if feedback tokens from first endpoint indicate stream had a video issue, False otherwise.	
Second Feedback Has Video Issue	Boolean	True if feedback tokens from second endpoint indicate stream had a video issue, False otherwise.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Feedback Has AppSharing Issue	Boolean	True if feedback tokens from first endpoint indicate stream had an app sharing issue. False otherwise.	
Second Feedback Has Appsharing Issue	Boolean	True if feedback tokens from second endpoint indicate stream had an app sharing issue. False otherwise.	
Audio Signal			
First Echo Event Causes	Flags	Flags that indicate the reasons the DeviceEchoEvent was raised on the first endpoint. There may be multiple flags for a single stream. Flags include: BAD_TIMESTAMP - audio sample timestamps from capture or render device used were poor quality POSTAEC_ECHO - high level of echo remained after echo cancellation MIC_CLIPPING - signal level from capture device had significant instances of maximum signal level EVENT_ANLP - audio samples from capture contain high noise. **Example value:** BAD_TIMESTAMP	• This was a non-audio stream • No event causes were reported by the first endpoint
Second Echo Event Causes	Flags	Flags that indicate the reasons the DeviceEchoEvent was raised on the second endpoint. There may be multiple flags for a single stream. Flags include: BAD_TIMESTAMP - audio sample timestamps from capture or render device used were poor quality POSTAEC_ECHO - high level of echo remained after echo cancellation MIC_CLIPPING - signal level from capture device had significant instances of maximum signal level EVENT_ANLP - audio samples from capture contain high noise. **Example value:** BAD_TIMESTAMP	• This was a non-audio stream • No event causes were reported by the first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Echo Percent Mic In	Range (percentage)	Percentage of time when echo is detected in the audio from the capture or microphone device prior to echo cancellation by the first endpoint. Values grouped by range. **Example value:** 068: [5 - 10)	• This was a non-audio stream • Data was not reported by first endpoint
Second Echo Percent Mic In	Range (percentage)	Percentage of time when echo is detected in the audio from the capture or microphone device prior to echo cancellation by the second endpoint. Values grouped by range. **Example value:** 068: [5 - 10)	• Indicates a non-audio stream • Data was not reported by second endpoint
First Echo Percent Send	Range (percentage)	Percentage of time echo is detected in the audio after echo cancellation by the first endpoint. Values grouped by range. **Example value:** 068: [5 - 10)	• This was a non-audio stream • Data was not reported by first endpoint
Second Echo Percent Send	Range (percentage)	Percentage of time echo is detected in the audio after echo cancellation by the second endpoint. Values grouped by range. **Example value:** 068: [5 - 10)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Send Signal Level	Range (dB decibels)	Average energy level of sent audio for audio classified as mono speech, or left channel of stereo speech by the first endpoint. Values grouped by range. **Example value:** 055: [-15 - -10)	• This was a non-audio stream • Data was not reported by first endpoint
Second Send Signal Level	Range (dB decibels)	Average energy level of sent audio for audio classified as mono speech, or left channel of stereo speech by the second endpoint. Values grouped by range. **Example value:** 055: [-15 - -10)	• Indicates a non-audio stream • Data was not reported by the second endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Received Signal Level	Range (dB decibels)	Average energy level of received audio for audio classified as mono speech, or left channel of stereo speech by the first endpoint. Values grouped by range. **Example value:** 056: [-10 - -5)	• This was a non-audio stream • Data was not reported by first endpoint
Second Received Signal Level	Range (dB decibels)	Average energy level of received audio for audio classified as mono speech, or left channel of stereo speech by the second endpoint. Values grouped by range. **Example value:** 056: [-10 - -5)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Send Noise Level	Range (dB decibels)	Average energy level of audio classified as mono noise or stereo left channel noise sent by the first endpoint. Values grouped by range. **Example value:** 048: [-50 - -45)	• This was a non-audio stream • Data was not reported by first endpoint
Second Send Noise Level	Range (dB decibels)	Average energy level of audio classified as mono noise or stereo left channel noise by the second endpoint. Values grouped by range. **Example value:** 048: [-50 - -45)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Received Noise Level	Range (dB decibels)	Average energy level of mono noise or stereo left channel noise received by the first endpoint. Values grouped by range. **Example value:** 048: [-50 - -45)	• This was a non-audio stream • Data was not reported by first endpoint
Second Received Noise Level	Range (dB decibels)	Average energy level of mono noise or stereo left channel noise received by the second endpoint. Values grouped by range. **Example value:** 048: [-50 - -45)	• Indicates a non-audio stream • Data was not reported by the second endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Initial Signal Level RMS	Range (dB decibels)	The root-mean-square (RMS) of the received signal for the first 30 seconds of the call for the first endpoint. See 2.2.1.28.1 Child Elements	
Second Initial Signal Level RMS	Range (dB decibels)	The root-mean-square (RMS) of the received signal for the first 30 seconds of the call for the second endpoint. See 2.2.1.28.1 Child Elements for more information.	
First RxAGC Signal Level	Range (dB decibels)	Signal level received at the automatic gain control (AGC) for the first inbound audio stream.	
Second RxAGC Signal Level	Range (dB decibels)	Signal level received at the automatic gain control (AGC) for the second inbound audio stream.	
First RxAGC Noise Level	Range (dB decibels)	Noise level received at the automatic gain control (AGC) for the first inbound audio stream.	
Second RxAGC Noise Level	Range (dB decibels)	Noise level received at the automatic gain control (AGC) for the second inbound audio stream.	
First Render Loopback Signal Level	Range (dB decibels)	Loopback signal level for the first inbound audio stream.	
Second Render Loopback Signal Level	Range (dB decibels)	Loopback signal level for the Second inbound audio stream.	
Client Event			
First Network Send Quality Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the network was causing poor quality of the audio sent. Values grouped by range. **Example value:** 015: [0.01 - 0.02)	• Indicates a non-audio stream • Data was not reported by the first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Network Send Quality Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the network was causing poor quality of the audio sent. Values grouped by range. **Example value:** 015: [0.01 - 0.02)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Network Receive Quality Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the network was causing poor quality of the audio received. Values grouped by range. **Example value:** 015: [0.01 - 0.02)	• This was a non-audio stream • Data was not reported by first endpoint
Second Network Receive Quality Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the network was causing poor quality of the audio received. Values grouped by range. **Example value:** 015: [0.01 - 0.02)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First CPU Insufficient Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the CPU resources available were insufficient and caused poor quality of the audio sent and received. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the first endpoint
Second CPU Insufficient Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the CPU resources available were insufficient and caused poor quality of the audio sent and received. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Half Duplex AEC Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected issues and operated the acoustic echo canceler in half-duplex mode, which impacted the ability to have real-time two-way communication. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Device Half Duplex AEC Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected issues and operated the acoustic echo canceler in half-duplex mode, which impacted the ability to have real-time two-way communication. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Render Not Functioning Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the render device was not working properly. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Render Not Functioning Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the render device was not working properly. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Capture Not Functioning Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected the capture device was not working properly. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Capture Not Functioning Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected the capture device was not working properly. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Glitches Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected as glitches or gaps that caused poor quality of the audio being sent or received. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Device Glitches Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected as glitches or gaps in the audio that caused poor quality of the audio being sent or received. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Low SNR Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected low speech to noise level that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the first endpoint
Second Device Low SNR Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected low speech to noise level that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Low Speech Level Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected low speech level that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Low Speech Level Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected low speech level that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Clipping Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected clipping in the captured audio that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Device Clipping Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected clipping in the captured audio that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Echo Event Ratio	Range (ratio)	Fraction of the call that the first endpoint detected echo that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Echo Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected echo that caused poor quality of the audio being sent. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Near End To Echo Ratio Event Ratio	Range (ratio)	Fraction of the call where the first endpoint detected a ratio of near end signal to echo that caused poor quality audio. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Near End To Echo Ratio Event Ratio	Range (ratio)	Fraction of the call that the second endpoint detected a ratio of near end signal to echo level that caused poor quality audio. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Render Zero Volume Event Ratio	Range (ratio)	Fraction of the call that first endpoint detected device render volume is set to 0. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Device Render Zero Volume Event Ratio	Range (ratio)	Fraction of the call that second endpoint detected device render volume is set to 0. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Render Mute Event Ratio	Range (ratio)	Fraction of the call that first endpoint detected device render is muted. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Render Mute Event Ratio	Range (ratio)	Fraction of the call that second endpoint detected device render is muted. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Multiple Endpoints Event Count	Range (ratio)	Number of times during the call that the first endpoint detected multiple endpoints in the same room or acoustic environment. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint
Second Device Multiple Endpoints Event Count	Range (ratio)	Number of times during the call that the second endpoint detected multiple endpoints in the same room or acoustic environment. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
First Device Howling Event Count	Range (ratio)	Number of times during the call that the first endpoint detected two or more endpoints in the same room that caused poor quality audio in the form of howling or screeching audio. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• This was a non-audio stream • Data was not reported by first endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Device Howling Event Count	Range (ratio)	Number of times during the call that the second endpoint detected two or more endpoints in the same room or acoustic environment that caused poor quality audio in the form of howling or screeching audio. Values grouped by range. **Example value:** 016: [0.02 - 0.03)	• Indicates a non-audio stream • Data was not reported by the second endpoint
Call Diagnostic			
Error Report Sender	String	Indicates which endpoint sent the call error report for the stream. This report contains additional telemetry and may indicate call setup or call drop issue with the call. **Example value:** First	• Indicates no call error report was sent.
Is Media Error	String	Indicates if the call error report for the stream was a media level error or not. This report contains additional telemetry and may indicate call setup or call drop issue with the call.	• Indicates no call error report was sent.
Media Failure Type	Enumeration **Possible values:** • Midcall • CallSetup • NotMediaFailure.	The type of media failure associated with the stream.	• Indicates no call error report was sent.
Call Classification	Enumeration	Reliability Classification assigned to the call. **Possible values**: Success, Failure, ClassificationUnavailable	
Classification Reason	String	Reason the classification was assigned to the stream.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Test Call Type	Enumeration	Indicates whether this call is a regular call or a test call. If it's a test call, this indicates the type of test call. **Possible Values:** NonTest, Silent, UserInitiated, Synthetic **Meanings:** NonTest – Regular Call Silent – Silent Test Call UserInitiated – User initiated test call Synthetic – ST endpoint-initiated call	
Session			
RTP RTCP Mux	Boolean	True indicates that RTP and RTCP were multiplexed on the same ports. False otherwise.	• Data was not reported by the endpoint
Stun Version	Integer	Version of STUN protocol used for establishing the call.	• Data was not reported by the endpoint **Example value:** 2
Media Relay	String	IP address for Media relay(s) used for the session. May report a pair of relay separated by a '+' if the stream. **Example value:** "13.107.8.2 + 13.107.8.2"	• This data was not reported by the endpoints
Is Anonymous Join Session	Boolean	True if user joining conference was anonymous, False otherwise.	• No data to determine if user was joined anonymously or not
Has Media Diagnostic Blob	Boolean	True if session had media diagnostics data, False otherwise.	• Some signaling data was not collected for this stream

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Call Setup Failure Reason	Enumeration	Classification of why media connection could not be established for a call. **Possible values:** **Missing FW Deep Packet Inspection Exemption Rule** - indicates that network equipment along the path likely prevented the media path from being established due to deep packet inspection rules. This may be due to proxy or firewall rules not being correctly configured. **Missing FW IP Block Exemption Rule** - indicates that network equipment along the path likely prevented the media path from being established to the Office 365 network. This may be due to proxy or firewall rules not being correctly configured to allow access to IP addresses and ports used for Skype for Business traffic. **Other** - indicates the media path for the call could not be established but the root cause could not be classified. Not Media Failure - indicates no issue was detected with the establishment of the media path.	• Call set up failed due to an unknown media issue
DNS			
Used DNS Resolve Cache	Boolean	True if endpoint used DNS cache to resolve media relay address, False otherwise.	• This data was not reported by the endpoint
UserData			
First User ObjectId	String	The Active Directory object ID of the first endpoint's user. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second User ObjectId	String	The Active Directory object ID of the second endpoint's user. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
First MAC Address	String	The media access control (MAC) address of the first endpoint's network device. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
Second MAC Address	String	The media access control (MAC) address of the second endpoint's network device. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
First Sip Uri	String	The Session Initiation Protocol (SIP) URI of the first endpoint's user. Populated only for Skype for Business endpoints. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
Second Sip Uri	String	The SIP URI of the first endpoint's user. Populated only for Skype for Business endpoints. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
First Phone Number	String	The phone number of the first endpoint's user. Populated only for PSTN endpoints. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Second Phone Number	String	The phone number of the second endpoint's user. Populated only for PSTN endpoints. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
First UPN	String	The user principal name (UPN) of the first endpoint's user. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
Second UPN	String	The user principal name (UPN) of the second endpoint's user. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
First Feedback Text	String	Verbatim feedback text, if any, provided by first endpoint's user at the end of a call. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
Second Feedback Text	String	Verbatim feedback text, if any, provided by second endpoint's user at the end of a call. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
First Client Endpoint Name	String	The machine name of the first endpoint. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	
Second Client Endpoint Name	String	The machine name of the second endpoint. Only available for the past 28 days of data and only visible to users with roles allowing EUII access.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
First Endpoint Product Name	String	The product name of the first endpoint (either Skype for Business or Microsoft Teams).	
Second Endpoint Product Name	String	The product name of the second endpoint (either Skype for Business or Microsoft Teams).	
First UserType	Enumeration string	The type of user on the first endpoint. **Possible values:** User, Server, Anonymous, Application, PSTN, Voicemail, Unknown **Unknown** - the default value if UserType can't be determined based on the info received. **PSTN** - a PSTN User. **Anonymous** - a Teams user or Skype for Business visitor. **Application** - a bot. **User** - an AAD User, can be either Skype for Business User or Teams User. **Server** - for conferences, at least one side is a server. **Voicemail** - the endpoint was answered by the voicemail service.	
Second UserType	Enumeration string	The type of user on the second endpoint. **Possible values:** User, Server, Anonymous, Application, PSTN, Voicemail, Unknown **Unknown** - the default value if UserType can't be determined based on the info received. **PSTN** - a PSTN User. **Anonymous** - a Teams user or Skype for Business visitor. **Application** - a bot. **User** - an AAD User, can be either Skype for Business User or Teams User. **Server** - for conferences, at least one side is server. **Voicemail** - the endpoint was answered by voicemail service.	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Datapair			
Network Connection Detail Pair	Enumerated pair **Possible values:** wifi : wifi wifi : wired Wired : wifi Wired : Wired MobileBB : MobileBB MobileBB : Other MobileBB : Tunnel MobileBB : wifi MobileBB : Wired Other : Other Other : wifi Other : Wired Tunnel : Tunnel Tunnel : wifi Tunnel : Wired : MobileBB : Other : Tunnel : wifi : Wired :	Pair of network connection detail for the first and second endpoint.	• Endpoint network connectivity type was unknown. This may happen if the call could not be established.
User Agent Category Pair	Enumerated pair	Pair of User Agent Category for first and second endpoint. **Example value:** AV-MCU : OC	• Endpoint user agent was not a known type
Is Server Pair	Enumerated pair **Possible values:** Client : Client Client : Server Server : Server	Pair of identification of first and second endpoints as either Client or Server.	no Blank values
Connectivity Ice Pair	Enumerated pair **Possible values:** DIRECT : DIRECT DIRECT : FAILED DIRECT : HTTP FAILED : FAILED FAILED : RELAY HTTP : RELAY : : DIRECT : FAILED : HTTP : RELAY	Pair of type of ICE connectivity used by each endpoint.	• ICE connectivity used by endpoint was not known or reported
OS Pair	Enumerated pair	Pair of the OS name and version for first and second endpoint. **Example value:** Windows 10 : Windows 10	• OS name could not be parsed or was not reported by endpoint

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
Tenant Id Pair	Enumerated pair	Pair of the tenant ids for first and second endpoint. **Example value:** 00000000 — 0000 - 0000 - 0000 — 000000000000 : 00000000 — 0000 - 0000 - 0000 — 000000000000	• The tenant identifier could not be determined. This may happen if endpoint is signed in to an on-premise Skype for Business Server deployment.
Building Name Pair	Enumerated pair	Pair of the building name for the first and second endpoint.	• The building name for an endpoint could not be determined. This could be because the endpoint is located outside the corporate network, or is accessing the network from a site without a subnet mapping. **Example value:** Main Building : Branch Site Building
Inside Corp Pair	Enumerated pair **Possible values:** Inside : Inside Inside : Outside Outside : Outside	Pair showing if the endpoints were located inside or outside the corporate network based on the subnet mapping.	
Scenario Pair	Enumerated pair	Pair showing if the endpoints were located inside or outside the corporate network based on the subnet mapping and the network connection detail. **Note:** The pairs are separated by '--'. **Example value:** Client-Inside--Client-Inside-wifi	• The network connectivity type was unknown for either or both endpoints.
PSTN			
PSTN Call End Reason (SIP response code)	Int	A three-digit integer response code shows the final status of the call. For more information about SIP explanation, please see the List of SIP response codes. **Example:** 404	
PSTN Trunk FQDN	String	FQDN is the fully qualified domain name (FQDN) of the Session Border Controller (SBC). **Example:** sbcgw.contoso.com	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
PSTN Carrier Name	String	The company that is authorized by regulatory agencies to operate a telecommunications system. **Example:** Colt	Direct Routing does not have a carrier. Only a calling plan has a carrier.
PSTN Call Type	String	This string combines the service type and call type. Service type: user -> calling plan byot -> direct routing conf -> audio conferencing ucap -> voice app emergency -> emergency number Call type: In -> inbound call Out -> outbound call Out_transfer -> outbound call gets transferred to third person Out_forward -> outbound call gets forwarded to third person Out_conf -> outbound call with ad-hoc PSTN participant **Example:** ByotIn	
PSTN Connectivity Type	String	PSTN connectivity type includes Direct Routing, Calling Plan, or Audio Conferencing. At this time, only Direct Routing is available in the Call Quality Dashboard (CQD). **Example:** Direct Routing	
PSTN Final SIP Code Phrase	String	The reason phrase corresponding to the SIP response code and Microsoft response code. **Example:** BYE	
PSTN Call End Sub Reason	Int	A response code sent out from the Microsoft component that indicates specific actions that occurred. **Example:** 540000	
PSTN Event Type	String	An event type that provides telemetry. **Example:** End	

NAME	DATA TYPE	DESCRIPTION	POSSIBLE REASONS FOR BLANK VALUES
PSTN Event Info Time	Date	The time in UTC format when an outbound call starts from the Microsoft network or an inbound call reaches the Microsoft network. **Example:** 2020-02-06 20:57:53.1750000	
PSTN MP Location	String	The Media Processor location will show the media path when in non-bypass mode. **Example:** USWE	
First PSTN Country Region	String	If FirstIsCaller is true, First PSTN Country Region is the caller's country. If it is false, then Second PSTN Country region is the caller's country. **Example:** US	
Jitter	Milliseconds	The variation in arrival time of RTP packets. Please see Stream Classification in Call Quality Dashboard for more information. **Example:** 5.982	
Packet Loss Rate	Percentage	The percentage of streams between Mediation Server and SBC or Gateway, if available. Please see Stream Classification in Call Quality Dashboard for more information. **Example:** 1.2%	
Latency (Round-trip Time)	Milliseconds	The average network propagation round-trip time per stream computed. Please see Stream Classification in Call Quality Dashboard for more information. **Example:** 3.49	

Notes on dimension data type/units

Boolean

Boolean values are always either True or False. In some cases, True can also be represented as 1 and False can be represented as 0.

Range

Dimensions that are provided as range or group of values are shown using the following format:

<sort order string> [<lower bound inclusive> - <upper bound exclusive>

For example, the Duration (Minutes) dimension represents the call duration in seconds with the value reported as a range of values.

DURATION (MINUTES)	HOW TO INTERPRET
062: [0 - 0)	Stream duration = 0 minutes
064: [1 - 2)	1 minute < = stream duration < 2 minutes
065: [2 - 3)	2 minutes < = stream duration < 3 minutes
066: [3–4)	3 minutes < = stream duration < 4 minutes

The <sort order string> is used to control the sort order when presenting the data and can be used for filtering. For example, a filter on Duration (Minutes) < "065", would show streams with duration less than 2 minutes (The leading '0' is needed for the filter to work as expected).

> **NOTE**
> The actual value of the sort order string isn't significant.

Enumeration strings

Strings used by CQD are often derived from data files, and these can be nearly any combination of character within the allowed length. Some dimensions look like strings, but since they can only be one of a short list of predefined values, they are enumerations and not true strings. Some enumerations strings are also used in pairs.

Enumeration pair

Dimensions that are provided as an enumeration pair are shown using the following format:

<enumeration value from one end point> : <enumeration value from the other endpoint>

The ordering of the enumeration values is consistent but doesn't reflect ordering of the first or second endpoints.

For example, the Network Connection Detail Pair shows the Network Connection Detail values for the two endpoints:

NETWORK CONNECTION DETAIL PAIR	HOW TO INTERPRET
Wired : Wired	First and second endpoints both used wired ethernet connections.
Wired : wifi	First endpoint used wired ethernet connection and second endpoint used Wi-Fi connection, or the second endpoint used wired ethernet connection and first endpoint used Wi-Fi connection.
: wifi	First endpoint used a WiFi connection and the network connection used by the second endpoint is unknown, or the second endpoint used a WiFi connection and the network connection used by the first endpoint is unknown.

Blank values

The table above lists possible reasons why a dimension may be blank. Many dimensions and measurements will

be blank if the QoE Record Available dimension is false. This typically occurs when the call wasn't successfully established.

Measurements

Many Measurement values can also be used as filters. The following table lists the measurements currently available in CQD, shown in the order listed in the Query Editor

MEASURE NAME	UNITS	DESCRIPTION	
Total Stream Count	Number of streams	Number media streams regardless of type of media, including reliability/diagnostics streams that may not have a media type.	
Total CDR Available Stream Count	Number of streams	Number of media streams with reliability/diagnostics information available. See Call detail recording (CDR) in Skype for Business Server	
Total Media Failed Stream Count	Number of streams	Number of streams where either media path could not be established or did not terminate normally.	
Total Call Setup Failed Stream Count	Number of streams	Number of streams where media path could not be established between the endpoints at the start of the call.	
Total Call Dropped Stream Count	Number of streams	Number of streams where media path did not terminate normally.	
Total Media Succeeded Stream Count	Number of streams	Number of streams where media path was established and terminated normally.	
Total Call Setup Succeeded Stream Count	number of streams	Number of streams where media path could be established between the endpoints at the start of the call.	
Total Call Setup Failure Percentage	Percentage	Percentage of all streams where media path could not be established between the endpoints at the start of the call.	
Total Call Dropped Failure Percentage	Percentage	Percentage of successfully established streams where media path did not terminate normally.	

MEASURE NAME	UNITS	DESCRIPTION	
Total Answer Seizure Ratio	Ratio	Ratio of calls with duration less than 5 seconds over the total number of calls.	
Total Short Call Percentage	Percentage	Percentage of total calls less than 1 minute long.	
Total Media Failure Percentage	Percentage	Percentage of all streams where either media path could not be established or did not terminate normally.	
Total Audio Stream Duration (Minutes)	Minutes	Total audio stream duration in minutes in the selected time range.	
Media Failed Due To Firewall DPI Stream Count	Number of streams	Number of streams that failed to be established due to network equipment blocking access due to deep packet inspection not allowing Skype for Business traffic. These failures typically indicate a proxy, firewall or other network security device is not correctly configured to access the IP address and ports used by Skype for Business in Microsoft 365 or Office 365.	
Firewall DPI Media Failure Percentage	Percentage	Percentage of streams that failed to be established due to network equipment blocking access due to deep packet inspection not allowing Skype for Business traffic. These failures typically indicate a proxy, firewall or other network security device is not correctly configured to access the IP address and ports used by Skype for Business in Microsoft 365 or Office 365.	

MEASURE NAME	UNITS	DESCRIPTION	
Media Failed Due To Firewall IP Blocked Stream Count	Number of streams	Number of streams that failed to be established due to network equipment blocking access to Skype for Business servers. These failures typically indicate a proxy, firewall or other network security device is not correctly configured to access the IP address and ports used by Skype for Business in Microsoft 365 or Office 365.	
Firewall IP Blocked Media Failure Percentage	Percentage	Percentage of streams that failed to be established because network equipment blocked access to Skype for Business servers. These failures typically indicate a proxy, firewall, or other network security device is not correctly configured to access the IP address and ports used by Skype for Business in Microsoft 365 or Office 365.	
Media Failed Due To Other Stream Count	Number of streams	Number of streams where media path could not be established between the endpoints due to an undetermined/unclassified reason.	
Other Media Failure Percentage	Percentage	Percentage of streams where media path could not be established between the endpoints due to an undetermined/unclassified reason.	
Total CDR Available Call Count	Number of streams	Total number of media streams with reliability/diagnostics information available. There is an up to 0.2% error for this measure. See note below for details.	
Total Media Failed Call Count	Number of streams	Number of streams where media path could not be established between the endpoints. There is an up to 0.2% error for this measure. See note below for details.	
Audio Stream Count	Number of streams	Number of audio streams.	

MEASURE NAME	UNITS	DESCRIPTION	
Audio Poor Stream Count	Number of streams	Number of audio streams classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Audio Good Stream Count	Number of streams	Number of audio streams classified as good based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Audio Unclassified Stream Count	Number of streams	Number of audio streams that did not have sufficient data to be classified as good or poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Audio Poor Percentage	Percentage	Percentage of all audio streams that were classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Audio OnePercent PacketLoss Count	Number of streams	Number of audio streams with packet loss greater than 1%.	
Audio OnePercent PacketLoss Percentage	Percentage	Percentage of all audio streams with packet loss greater than 1%.	
Audio Poor Due To Jitter Count	Number of streams	Number of audio streams where the jitter metric exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
Audio Poor Due To PacketLoss Count	Number of streams	Number of audio streams where the packet loss metric exceeds thresholds listed here: Stream Classification in Call Quality Dashboard	
Audio Poor Due To Degradation Count	Number of streams	Number of audio streams where the degradation metric exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	

MEASURE NAME	UNITS	DESCRIPTION	
Audio Poor Due To RoundTrip Count	Number of streams	Number of audio streams where the round trip exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
Audio Poor Due To ConcealedRatio Count	Number of streams	Number of audio streams where the concealed ratio exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
Audio SLA Good Call Count	Number of calls	Number of audio calls within scope of the Skype for Business Voice Quality SLA (Volume Licensing for Microsoft Products and Online Services) classified as meeting the network performance targets.	
Audio SLA Poor Call Count	Number of calls	Number of audio calls within scope of the Skype for Business Voice Quality SLA (Volume Licensing for Microsoft Products and Online Services) classified as not meeting the network performance targets.	
Audio SLA Call Count	Number of calls	Number of audio calls within scope of the Skype for Business Voice Quality SLA (Volume Licensing for Microsoft Products and Online Services).	
Audio SLA Good Call Percentage	Percentage	Percentage of audio calls within scope of the Skype for Business Voice Quality SLA (Volume Licensing for Microsoft Products and Online Services) that were classified as meeting the network performance targets.	
Audio Good Call Stream Count	Number of streams	Number of audio streams where both audio streams in the call (call-leg) are not classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	

MEASURE NAME	UNITS	DESCRIPTION	
Audio Poor Call Stream Count	Number of streams	Number of audio streams where at least one audio stream in the call (call-leg) was classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Audio Unclassified Call Stream Count	Number of streams	Number of audio streams where both audio streams in the call (call-leg) could not be classified due to missing network metrics.	
Audio Poor Call Level Percentage	Percentage	Percentage of all audio streams where at least one audio stream in the call (call-leg) was classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Audio Call Count	Number	Number of calls involving audio. There is an up to 0.2% error for this measure. See note below for details.	
Audio Poor Call Count	Number	Number of calls involving audio classified as poor. There is an up to 0.2% error for this measure. See note below for details.	
Audio Good Call Count	Number of calls	Number of calls involving audio classified as good. There is an up to 0.2% error for this measure. See notes below for details.	
Audio Unclassified Call Count	Number of calls	Number of calls involving audio that could not be classified Good or Poor. There is an up to 0.2% error for this measure. See note below for details.	
Audio Poor Call Percentage	Percentage of calls	Percentage of calls involving audio classified as poor. There is an up to 0.2% error for this measure. See note below for details.	
AppSharing Stream Count	Number of streams	Number of RDP-based application sharing streams.	

MEASURE NAME	UNITS	DESCRIPTION	
AppSharing Poor Due To SpoiledTilePercentTotal Count	Number of streams	Number of application sharing streams where the spoiled tile percent total metric exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
AppSharing Poor Due To RelativeOneWayAverage Count	Number of streams	Number of application sharing streams where the spoiled tile percent total metric exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
AppSharing Poor Due To RDPTileProcessingLatencyAverage Count	Number of streams	Number of application sharing streams where the RDP tile processing latency average exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
AppSharing Poor Stream Count	Number of streams	Number of application sharing streams classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
AppSharing Good Stream Count	Number of streams	Number of application sharing streams classified as good based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
AppSharing Unclassified Stream Count	Number of streams	Number of application sharing streams that did not have sufficient data to be classified as good or poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
AppSharing Poor Percentage	Percentage	Percentage of total application sharing streams that were classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Video Stream Count	Number of streams	Number of video streams.	

MEASURE NAME	UNITS	DESCRIPTION	
Video Poor Due To VideoPostFecplr Count	Number of streams	Number of video streams where the Video Post Fec plr exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
Video Poor Due To VideoLocalFrameLossPercentageAvg Count	Number of streams	Number of video streams where the Video Local Frame Loss Percentage Avg exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
Video Poor Due To VideoFrameRateAvg Count	Number of streams	Number of Video streams where the Video Frame Rate Avg exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
Video Poor Due to Freeze Count	Number of streams	Number of main video streams where the Video Freeze metric exceeds thresholds listed here. Stream Classification in Call Quality Dashboard. This field is specific to Microsoft Teams only	
Video Poor Stream Count	Number of streams	Number of video streams classified as poor based on network metrics listed here Stream Classification in Call Quality Dashboard.	
Video Good Stream Count	Number of streams	Number of video streams classified as good based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Video Unclassified Stream Count	Number of streams	Number of video streams that did not have sufficient data to be classified as good or poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Video Poor Percentage	Percentage	Percentage of total video streams that were classified as poor based on network metrics listed here Stream Classification in Call Quality Dashboard.	

MEASURE NAME	UNITS	DESCRIPTION	
Video Poor Percentage Due to Freeze	Percentage	Percentage of main video streams that were classified as poor based on the Video Poor metric Due to Freeze listed here Stream Classification in Call Quality Dashboard. This field is specific to Microsoft Teams only	
VBSS Stream Count	Number of streams	Number of video-based-screen sharing streams.	
VBSS Poor Due To VideoPostFecplr Count	Number of streams	Number of video-based-screen-sharing streams where the Video Post Fec plr exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
VBSS Poor Due To VideoLocalFrameLossPercentageAvg Count	Number of streams	Number of video-based-screen-sharing streams where the Video Local Frame Loss Percentage Avg exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
VBSS Poor Due To VideoFrameRateAvg Count	Number of streams	Number of video-based-screen-sharing streams where the Video Frame Rate Avg exceeds thresholds listed here: Stream Classification in Call Quality Dashboard.	
VBSS Poor Stream Count	Number of streams	Number of video-based-screen-sharing streams classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
VBSS Good Stream Count	Number of streams	Number of video-based-screen-sharing streams classified as good based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
VBSS Unclassified Stream Count	Number of streams	Number of video-based-screen-sharing streams that did not have sufficient data to be classified as good or poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	

MEASURE NAME	UNITS	DESCRIPTION	
VBSS Poor Percentage	Percentage	Percentage of total video-based-screen-sharing streams that classified as poor based on network metrics listed here: Stream Classification in Call Quality Dashboard.	
Avg Call Duration	Seconds	Average duration of streams in seconds.	
First Feedback Rating Avg	User rating (1-5)	Average rating of streams reported by the user using the first endpoint. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
Second Feedback Rating Avg	User rating (1-5)	Average rating of streams reported by the user using the second endpoint. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
First Feedback Rating Count	Number of rated streams	Number of streams rated by the user using the first endpoint. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
Second Feedback Rating Count	Number of rated streams	Number of streams rated by the user using the second endpoint. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
First Feedback Rating Poor Count	Number of rated streams	Number of streams rated by the user using the first endpoint as either 1 or 2. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
Second Feedback Rating Poor Count	Number of rated streams	Number of streams rated by the user using the second endpoint as either 1 or 2. Calls are rated from 1-5 and the rating is applied to all streams of the call.	

MEASURE NAME	UNITS	DESCRIPTION	
First Feedback Rating Poor Percentage	Number of rated streams	Percentage of all rated streams that were rated by the user using the first endpoint as either 1 or 2. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
Second Feedback Rating Poor Percentage	Number of rated streams	Percentage of all rated streams that were rated by the user using the second endpoint as either 1 or 2. Calls are rated from 1-5 and the rating is applied to all streams of the call.	
First Feedback Token Audio Issue Count	Number rated streams	Number of streams where user using the first endpoint indicated an issue with audio.	
Second Feedback Token Audio Issue Count	Number rated streams	Number of streams where user using the second endpoint indicated an issue with audio.	
First Feedback Token Video Issue Count	Number of rated streams	Number of streams where user using the first endpoint indicated an issue with video.	
Second Feedback Token Video Issue Count	Number of rated streams	Number of streams where user using the second endpoint indicated an issue with video.	
Avg First Echo Percent Mic In	Percentage	Average percentage of time during the stream that the first endpoints detected echo in the audio from the capture or microphone device prior to echo cancellation.	
Avg Second Echo Percent Mic In	Percentage	Average percentage of time during the stream that the second endpoints detected echo in the audio from the capture or microphone device prior to echo cancellation.	

MEASURE NAME	UNITS	DESCRIPTION	
Avg First Echo Percent Send	Percentage	Average percentage of time during the stream that the first endpoints detected echo in the audio from the capture or microphone device after echo cancellation.	
Avg Second Echo Percent Send	Percentage	Average percentage of time during the stream that the second endpoints detected echo in the audio from the capture or microphone device after echo cancellation.	
Avg First Initial Signal Level RMS	Range (Decibels)	Average of the root-mean-square (RMS) of the received signal for the first 30 seconds of the call for the first endpoint. See 2.2.1.28.1 Child Elements for more information	
Avg Second Initial Signal Level RMS	Range (Decibels)	Average of the root-mean-square (RMS) of the received signal for the first 30 seconds of the call for the second endpoint.	
Avg First RxAGC Signal Level	Range (Decibels)	Average signal level received at the automatic gain control for the first inbound audio stream.	
Avg Second RxAGC Signal Level	Range (Decibels)	Average signal level received at the automatic gain control for the second inbound audio stream.	
Avg First RxAGC Noise Level	Range (Decibels)	Average noise level received at the automatic gain control for the first inbound audio stream.	
Avg Second RxAGC Noise Level	Range (Decibels)	Average noise level received at the automatic gain control for the second inbound audio stream.	
Avg First Render Loopback Signal Level	Range (Decibels)	Average level of first speaker loopback signal (after any device offload effects have been applied).	

MEASURE NAME	UNITS	DESCRIPTION	
Avg Second Render Loopback Signal Level	Range (Decibels)	Average level of second speaker loopback signal (after any device offload effects have been applied).	
Avg First Audio Send Signal Level	Decibels	Average energy level of sent audio for audio classified as mono speech, or left channel of stereo speech sent by first endpoints.	
Avg Second Audio Send Signal Level	Decibels	Average energy level of sent audio for audio classified as mono speech, or left channel of stereo speech sent by second endpoints.	
Avg First Audio Received Signal Level	Decibels	Average energy level of received audio for audio classified as mono speech, or left channel of stereo speech by the first endpoints.	
Avg Second Audio Received Signal Level	Decibels	Average energy level of received audio for audio classified as mono speech, or left channel of stereo speech by the second endpoints.	
Avg First Audio Send Noise Level	Decibels	Average energy level of sent audio for audio classified as mono noise or left channel of stereo noise by the first endpoints.	
Avg Second Audio Send Noise Level	Decibels	Average energy level of sent audio for audio classified as mono noise or left channel of stereo noise by the second endpoints.	
Avg First Audio Received Noise Level	Decibels	Average energy level of received audio for audio classified as mono noise or left channel of stereo noise by the first endpoints.	
Avg Second Audio Received Noise Level	Decibels	Average energy level of received audio for audio classified as mono noise or left channel of stereo noise by the second endpoints.	

MEASURE NAME	UNITS	DESCRIPTION	
First Audio Echo BAD_TIMESTAMP Count	Number of streams	Number of streams where the echo was caused by bad device timestamps from the first endpoints that limited echo cancellation in audio sent.	
First Audio Echo POSTAEC_ECHO Count	Number of streams	Number of streams where the high echo was detected after echo cancellation for audio sent by the first endpoints.	
First Audio Echo EVENT_ANLP Count	Number of streams	Number of streams where the first endpoints detected noise in the captured audio that limited echo cancellation in audio sent.	
First Audio Echo EVENT_DNLP Count	Number of streams	Number of streams where the first endpoints detected noise in the captured audio that limited echo cancellation in audio sent.	
First Audio Echo MIC_CLIPPING Count	Number of streams	Number of streams where the first endpoints detected clipping in the captured audio that limited echo cancellation in audio sent.	
First Audio Echo BAD_STATE Count	Number of streams	Number of streams where the first endpoints detected issues with the internal state that limited echo cancellation in audio sent.	
Second Audio Echo BAD_TIMESTAMP Count	Number of streams	Number of streams where the echo was caused by bad device timestamps from the second endpoints that limited echo cancellation in audio sent.	
Second Audio Echo POSTAEC_ECHO Count	Number of streams	Number of streams where the high echo was detected after echo cancellation for audio sent by the second endpoints.	
Second Audio Echo EVENT_ANLP Count	Number of streams	Number of streams where the second endpoints detected noise in the captured audio that limited echo cancellation in audio sent.	

MEASURE NAME	UNITS	DESCRIPTION	
Second Audio Echo EVENT_DNLP Count	Number of streams	Number of streams where the second endpoints detected noise in the captured audio that limited echo cancellation in audio sent.	
Second Audio Echo MIC_CLIPPING Count	Number of streams	Number of streams where the second endpoints detected clipping in the captured audio that limited echo cancellation in audio sent.	
Second Audio Echo BAD_STATE Count	Number of streams	Number of streams where the second endpoints detected issues with the internal state that limited echo cancellation in audio sent.	
Avg Audio Degradation	Mean Opinion Score (0-5)	Average Network Mean Opinion Score degradation for streams. Represents how much the network loss and jitter have impacted the quality of received audio.	
Avg Jitter	Milliseconds	Average network jitter for streams in milliseconds.	
Avg Jitter Max	Milliseconds	Maximum network jitter for streams in milliseconds.	
Avg Packet Loss Rate	Ratio	Average of average percentage of packets lost computed using 5 second interval for streams. 0.1 indicates 10% packet loss.	
Avg Packet Loss Rate Max	Ratio	Average of maximum percentage of packets lost during any 5 second interval for streams. 0.1 indicates 10% packet loss.	
Avg Send Listen MOS	Number	Average of the prediction of the Wideband Listening Quality Mean Opinion Score (MOS-LQ) of the audio stream that is being sent from the user. See "Avg. sending MOS" at Lync Monitoring Reports Decoder	

MEASURE NAME	UNITS	DESCRIPTION	
Avg Overall Avg Network MOS	Mean Opinion Score (0-5)	Average or average network Mean Opinion Score for streams. Represents the average predicted quality of received audio factoring in network loss, jitter, and codec.	
Avg Ratio Concealed Samples	Ratio	Average of average ratio of the number of audio frames with samples generated by packet loss concealment to the total number of audio frames for streams. 0.1 indicates 10% of frames contained concealed samples.	
Avg Conceal Ratio Max	Ratio	Average of the maximum ratios of the number of audio frames with samples generated by packet loss concealment to the total number of audio frames for streams. 0.1 indicates 10% of frames contained concealed samples.	
Avg Ratio Stretched Samples	Ratio	Average of average ratio of the number of audio frames with samples that have been stretched to compensate for jitter or loss to the total number of audio frames for streams. 0.1 indicates 10% audio frames contained stretched samples.	
Avg Healer Packet Drop Ratio	Range (Ratio)	Average ratio of audio packets dropped by healer over total number of audio packets received by healer.	
Avg Healer FEC Packet Used Ratio	Range (Ratio)	Average ratio of used FEC packets over total number of received FEC packets.	
Avg Round Trip	Milliseconds	Average of average network propagation round-trip time computed as specified in RFC3550 in milliseconds for streams.	

MEASURE NAME	UNITS	DESCRIPTION	
Avg Round Trip Max	Milliseconds	Average of maximum network propagation round-trip time computed as specified in RFC3550 in milliseconds for streams.	
Avg Packet Utilization	Number of packets	Average number of Real-Time Transport Protocol (RTP) packets sent per second in the session.	
Avg Network Jitter	Milliseconds	Average of network jitter computed over 20 second windows during the session.	
Avg Network Jitter Max	Milliseconds	Average of maximum network jitter in milliseconds computed over 20 second windows during the session.	
Avg Network Jitter Min	Milliseconds	Average of minimum network jitter values in milliseconds computed over 20 second windows during the session for streams.	
Avg Jitter Buffer Size Max	Milliseconds	Maximum size of jitter buffer during session.	
Avg Jitter Buffer Size Min	Milliseconds	Minimum size of jitter buffer during session.	
Avg Relative OneWay	Milliseconds	Average computed relative one way delay of the peer.	
Avg Relative OneWay Gap Occurrences	Milliseconds	Average number of instances of gaps in the relative one way delay of the peer.	
Avg Relative OneWay Gap Density	Milliseconds	Average density of gaps in the relative one way delay of the peer.	
Avg Relative OneWay Gap Duration	Number (Milliseconds)	Average duration of gaps in the relative one way delay of the peer.	
Avg Audio Post FECPLR	Ratio	Average of packet loss rate after FEC has been applied for aggregated across all audio streams and codecs for streams.	

MEASURE NAME	UNITS	DESCRIPTION	
Avg Video Post FECPLR	Ratio	Average of packet loss rate after FEC has been applied for aggregated across all video streams and codecs for streams.	
Avg Video Local Frame Loss Percentage	Percentage	Average percentage of video frames lost as displayed to the user for streams. This includes frames recovered from network losses.	
Avg Video Received Frame Rate Average	Frames per second	Average of average frames per second received for all video streams computed over the duration of the session for streams.	
Avg Video Low Frame Rate Call Percent	Percentage	Average of percentage of time of the call where frame rate is less than 7.5 frames per second for streams.	
Avg Video Packet Loss Rate	Ratio	Average of average fraction of packets lost, as specified in RFC3550, computed over the duration of the session for streams.	
Avg Video Frame Rate	Frames per second	Average frames per second received for a video stream, computed over the duration of the session. Values grouped by range.	
Avg Video Dynamic Capability Percent	Milliseconds	Average of percentage of time that the client is running < 70% expected video processing capability for this type of CPU for streams.	
Avg AppSharing Spoiled Tile Percent Total	Milliseconds	Average of percentage of tiles which are discarded instead of being sent to a remote peer (for example, from the MCU to a viewer) for streams. Discarded tiles may be caused by bandwidth restrictions between client and server.	
Avg AppSharing Relative OneWay	Seconds	Average of average relative one-way delay between the endpoints in seconds for application sharing streams.	

MEASURE NAME	UNITS	DESCRIPTION	
Avg AppSharing RDP Tile Processing Latency	Milliseconds	Average of average latency in milliseconds processing tiles on the RDP Stack at the conferencing server for streams.	
Avg First Device Capture Not Functioning Event Ratio	Ratio	Average of the fraction of the call that the first endpoint detected the capture device was not working properly.	
Avg Second Device Capture Not Functioning Event Ratio	Ratio	Average of the fraction of the call that the second endpoint detected the capture device was not working properly.	
Avg First Device Render Not Functioning Event Ratio	Ratio	Average of the fraction of the call that the first endpoint detected the render device was not working properly.	
Avg Second Device Render Not Functioning Event Ratio	Ratio	Average of the fraction of the call that the second endpoint detected the render device was not working properly.	
Avg First Mic Glitch Rate	Number of glitches	Average First Mic Glitch Rate (glitches per 5 minutes for the endpoint microphone) for the stream.	
Avg Second Mic Glitch Rate	Number of glitches	Average Second Mic Glitch Rate (glitches per 5 minutes for the endpoint microphone) for the stream.	
Avg First Speaker Glitch Rate	Number of glitches	Average First Speaker Glitch Rate (glitches per 5 minutes for the endpoint loudspeaker) for the stream.	
Avg Second Speaker Glitch Rate	Number of glitches	Average Second Speaker Glitch Rate (glitches per 5 minutes for the endpoint loudspeaker) for the stream.	
First User Count	Number	Number of unique or distinct first endpoint users. Only available for the past 28 days of data. There is an up to 0.2% error for this measure. See note below for details.	

MEASURE NAME	UNITS	DESCRIPTION	
Second User Count	Number	Number of unique or distinct second endpoint users. Only available for the past 28 days of data. There is an up to 0.2% error for this measure. See note below for details.	
Avg First Device Glitches Event Ratio	Percentage	Average fraction of the calls that the first endpoint detected glitches or gaps in the media played or captured that caused poor quality of the media being sent or received.	
Avg Second Device Glitches Event Ratio	Percentage	Average fraction of the call that the second endpoint detected glitches or gaps in the media played or captured that caused poor quality of the media being sent or received.	
First Device Glitches Event Count	Number	Number of streams where the first endpoint detected significant glitches or gaps in the media played or captured that caused poor quality of the media being sent or received.	
Second Device Glitches Event Count	Number	Number of stream where the second endpoint detected significant glitches or gaps in the media played or captured that caused poor quality of the media being sent or received.	
PSTN Total Attempts Count	Number of calls	Total attempted calls, including successful calls and failed calls in the selected time range. There is an up to 0.2% error for this measure. See note below for details.	
PSTN Total Connected Count	Number of calls	Total successfully connected calls in the selected time range. There is an up to 0.2% error for this measure. See note below for details.	

MEASURE NAME	UNITS	DESCRIPTION	
PSTN Inbound Attempts Count	Number of calls	Total inbound attempted calls, including successful calls and failed calls in the select time range. There is an up to 0.2% error for this measure. See note below for details.	
PSTN Inbound Connected Count	Number of calls	Total inbound successfully connected calls in the selected time range. There is an up to 0.2% error for this measure. See note below for details.	
PSTN Outbound Attempts Count	Number of calls	Total outbound attempted calls, including successful calls and failed calls in the selected time range. There is an up to 0.2% error for this measure. See note below for details.	
PSTN Outbound Connected Count	Number of Calls	Total outbound successfully connected calls in the selected time range. There is an up to 0.2% error for this measure. See note below for details.	
PSTN Total Minutes	Minutes	Total minute usage in the selected time range.	
PSTN Inbound Total Minutes	Minutes	Total inbound minute usage in the selected time range.	
PSTN Outbound Total Minutes	Minutes	Total outbound minute usage in the selected time range.	
PSTN Active User Count	Number of users	The number of users who made at least one connected call during that day.	
PSTN Average Call Duration	Minutes	The average duration of all connected calls in the selected time range. Normally, a 1:1 PSTN call is four to five minutes. However, this average can differ for each company.	
PSTN Total Inbound Concurrent Call Count	Number of calls	Maximum number of simultaneous active inbound calls in a minute.	

MEASURE NAME	UNITS	DESCRIPTION	
PSTN Total Outbound Concurrent Call Count	Number of calls	Maximum number of simultaneous active outbound calls in a minute.	
P50 Latency	Milliseconds	50% of the requests should be faster than given latency.	
P50 Jitter	Milliseconds	50% of the requests should be faster than given Jitter.	
P50 Packet Loss Rate	Percentage	50% of the requests should have lower than the given Packet Loss Rate.	
PSTN Outgoing Post Dial Delay	Milliseconds	The delay that occurs on outgoing calls measured from the time a number has been dialed until the caller or called party hears ringing.	
PSTN Incoming Post Dial Delay	Milliseconds	The time or delay that occurs on incoming calls measured from the time a number has been dialed until the caller or called party hears ringing.	
PSTN NER Good Percentage	Percentage	The NER measures the ability of a network to deliver calls by measuring the number of calls sent versus the number of calls delivered to a recipient. NER = (Answered calls + User Busy + Ring no Answer + Terminal Reject Seizures)/ Total Attempt Calls x 100.There is an up to 0.2% error for this measure. See note below for details.	

Notes on measurements

Accuracy limitations

Certain user and call count measurements rely on performing a distinct countif operation on the data set to compute the count. There is currently an up to 0.2% error inherent with the distinct countif operation depending on the number of rows the operation is performed on. For the most accurate volume, you should use stream count measures since they do not rely on this distinct countif operation. Filtering to reduce the data volume may reduce the error but may not eliminate this source of error in distinct call and user counts. More information about this limitation can be found here dcount aggregate function.

Filters

Many Dimension and Measurement values can also be used as filters. You can use filters in your query to

eliminate information in the same way you'd select a Dimension or Measurement to add or include information in the query.

Related topics

Improve and monitor call quality for Teams

What is CQD?

Set up Call Quality Dashboard (CQD)

Upload tenant and building data

CQD data and reports

Use CQD to manage call and meeting quality

Stream Classification in CQD

Use Power BI to analyze CQD data

Stream Classification in Call Quality Dashboard (CQD)

11/2/2020 • 6 minutes to read • Edit Online

The Call Quality Dashboard (CQD) for Microsoft Teams and Skype for Business Online allows you to gain insights into the quality of calls made using Microsoft Teams and Skype for Business services. This topic provides detailed information about the quality classification of media streams. To learn more about CQD and how to set it up, see Set up Call Quality Dashboard.

Classifier Definitions

Streams in CQD are classified as *Good*, *Poor*, or *Unclassified* based on the values of the available key quality metrics. The metrics and conditions used to classify stream are shown in the tables that follow. CQD's "Poor Due To" dimensions can be used to understand which metric is responsible for a *Poor* classification. For more information on these dimensions, see Dimensions and measures available in Call Quality Dashboard.

Audio Classifier

If one or more of the following conditions are met, an audio stream is marked as *Poor*:

METRIC	CONDITION	EXPLANATION
Audio Degradation Avg	> 1.0	Average Network Mean Opinion Score degradation for stream. How much network loss and jitter have impacted the quality of received audio.
Round Trip	> 500	Average round-trip network propagation time, computed in milliseconds. Details available in RFC3550.
Packet Loss Rate	> 0.1	Average packet loss rate for stream.
Jitter	> 30	Average jitter for stream in milliseconds.
Ratio Concealed Samples Avg	> 0.07	Average ratio of the number of audio frames with concealed samples generated by packet loss healing to the total number of audio frames.

Video Classifier due to Freeze

The video stream is marked *Good* or *Poor* based on the value of a classifier score generated to estimate that the end user experienced Frozen Video. This classifier is available for Microsoft Teams product only.

STEP #	METRIC	SCENARIO	CONDITION	CLASSIFICATION IF CONDITION IS TRUE	CLASSIFICATION IF CONDITION IS FALSE	CLASSIFICATION IF METRIC IS UNAVAILABLE	EXPLANATION
1	Video Poor Due to Freeze Classifier	Is Server Pair is Client : Server	>0.246	*Poor*	*Good*	*Unclassified*	A Score between 0 and 1 that is generated based on a combination of user experience, freeze duration statistics and overall call experience
2	Video Poor Due to Freeze Classifier	Is Server Pair is Client : Client	>0.524	*Poor*	*Good*	*Unclassified*	A Score between 0 and 1 that is generated based on a combination of user experience, freeze duration statistics and overall call experience

Video Classifier

A video stream is marked as *Good* or *Poor* based on the value of the first available metric in the following order:

STEP #	METRIC	CONDITION	CLASSIFICATION IF CONDITION IS TRUE	CLASSIFICATION IF CONDITION IS FALSE	CLASSIFICATION IF METRIC IS UNAVAILABLE	EXPLANATION

STEP #	METRIC	CONDITION	CLASSIFICATION IF CONDITION IS TRUE	CLASSIFICATION IF CONDITION IS FALSE	CLASSIFICATION IF METRIC IS UNAVAILABLE	EXPLANATION
1	Video Local Frame Loss Percentage Avg	> 50%	*Poor*	*Good*	Proceed to step 2	Average percentage of video frames lost as displayed to the user. The average includes frames recovered from network losses.
2	Video Frame Rate Avg	< 7	*Poor*	*Good*	Proceed to step 3	Average frames per second received for a video stream, computed over the duration of the session.
3	Video Post FECPLR	> 0.15	*Poor*	*Good*	*Unclassified*	Packet loss rate after FEC has been applied aggregated across all video streams and codecs.

VBSS Classifier

A VBSS stream is marked as *Good* or *Poor* based on the value of the first available metric in the following order:

STEP #	METRIC	CONDITION	CLASSIFICATION IF CONDITION IS TRUE	CLASSIFICATION IF CONDITION IS FALSE	CLASSIFICATION IF METRIC IS UNAVAILABLE	EXPLANATION

STEP #	METRIC	CONDITION	CLASSIFICATION IF CONDITION IS TRUE	CLASSIFICATION IF CONDITION IS FALSE	CLASSIFICATION IF METRIC IS UNAVAILABLE	EXPLANATION
1	Video Local Frame Loss Percentage Avg	> 50%	*Poor*	*Good*	Proceed to step 2	Average percentage of video frames lost as displayed to the user. The average includes frames recovered from network losses.
2	Video Frame Rate Avg	< 2	*Poor*	*Good*	Proceed to step 3	Average frames per second received for a video stream, computed over the duration of the session.
3	Video Post FECPLR	> 0.15	*Poor*	*Good*	*Unclassified*	Packet loss rate after FEC has been applied aggregated across all video streams and codecs.

Application Sharing Classifier

An application sharing stream is marked as *Poor* if one or more of the following conditions are met:

METRIC	CONDITION	EXPLANATION
Spoiled Tile Percent Total	> 36	Percentage of tiles that are discarded instead of sent to a remote peer (for example, from the MCU to a viewer). Discarded (or spoiled) tiles might be caused by bandwidth restrictions between client and server.

METRIC	CONDITION	EXPLANATION
AppSharing RDP Tile Processing Latency Average	> 400	Average latency in milliseconds processing tiles on the RDP Stack at the conferencing server.
AppSharing Relative OneWay Average	> 1.75	Average relative one-way delay between the endpoints in seconds for application sharing streams.

Unclassified Streams

In CQD, a stream is marked *Unclassified* when Interactive Connectivity Establishment (ICE) connectivity fails or when all the metrics required to compute the stream classification are not reported.

To check for ICE connectivity failures, examine the dimensions "First Connectivity Ice" and "Second Connectivity Ice" for a "FAILED" value. If either value indicates a failure, the stream is marked as *Unclassified*.

If ICE connectivity succeeded for an *Unclassified* stream, the stream is likely considered *Unclassified* because key stream metrics were not reported. There are a few reasons these metrics may not be reported:

- **QoE reports were not received** — The metrics used for classification are reported in a QoE report sent at the end of a call. If this report is not produced (for example, because some third-party endpoints may not send QoE) or could not be sent (for example, because of a network outage), CQD is unable to classify the stream.

> **TIP**
> The "QoE Record Available" dimension can be used to determine whether a QoE report was received for a stream. Note that this dimension will have a value of "True" if a QoE report was received from either endpoint. A QoE report from both endpoints is required for the most accurate reporting of metrics.

- **Short calls** — Short calls may not have enough media activity to compute key stream metrics. Without these metrics, CQD is unable to classify the stream.

> **TIP**
> The dimensions "Duration (Seconds)", "Duration (Minutes)", "Duration 5 seconds or less", and "Duration 60 seconds or more" can be used to determine the duration of a stream. The measurement "Avg Call Duration" can also be used to compute the average duration for a set of streams.

- **Low packet utilization** — Like the "short call" scenario, sufficient packet utilization is required for computation of key stream metrics. Without these metrics, CQD is unable to classify the stream.
  - A common low packet utilization scenario occurs when an attendee joins a meeting to listen to the presenter, but never speaks (the microphone is muted for most of the call). Here, the audio stream inbound to the client has high packet utilization while the audio stream outbound from the client has little to no packet utilization. The duration of the

stream may be an hour or longer but the packet utilization on the stream from the client to the server is low since the microphone was muted, and an *Unclassified* stream results.

> **TIP**
> The "Packet Utilization" dimension and "Avg Packet Utilization" measurement can be used to determine the packet activity of a stream.

Related Topics

Improve and monitor call quality for Teams

What is CQD?

Set up Call Quality Dashboard (CQD)

Upload tenant and building data

CQD data and reports

Use CQD to manage call and meeting quality

Dimensions and measures available in CQD

Use Power BI to analyze CQD data

Create a building map for Call Quality Dashboard (CQD)

8/6/2020 • 2 minutes to read • Edit Online

In a Microsoft Teams or Skype for Business Online deployment, all clients are external. As a result, by default, all clients are reported as outside in Call Quality Dashboard (CQD), regardless of whether the client is connected on an internal corporate network.

When you work with CQD, you need to know the location of an endpoint and whether it was connected to a network you can manage or a network you can't manage, the assumption being that you can only improve networks you can manage. By uploading subnet and building information to CQD, you enable CQD to determine whether the endpoint was connected to an internal (managed) network or to an external (unmanaged) network. That's why it's important to create a building map for your organization and upload it to CQD.

Building mapping tools

There are many ways to map your organization's subnets. If you need help, you can use the CQDTools PowerShell Module described in this blog post. These tools are based on PowerShell and use Active Directory (AD) Sites and Services and Microsoft DHCP services to help pre-populate your building file. These tools will help with the following tasks:

1. Query AD Sites and Services, and create a building file based on the information contained within.
2. Query a Microsoft DHCP server or servers to pull subnet information and automatically create a building file.
3. Validate an existing building file, checking for duplicates and overlaps.
4. Find unmapped subnets in CQD.

Related topics

Upload tenant and building data in CQD

Use Power BI to analyze CQD data for Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

New in January 2020: Download Power BI query templates for CQD. Customizable Power BI templates you can use to analyze and report your CQD data.

For Call Quality Dashboard (CQD) reports in Teams, if you'd rather use Power BI to query and report your data, download our CQD Power BI templates. When you open the templates in Power BI, you'll be prompted to sign in with your CQD admin credentials. You can customize these query templates and distribute them to anyone in your organization who has a Power BI license and CQD admin permissions.

Before you can use these PBIT files, you'll need to Install the Power BI Connector for Microsoft CQD using the *MicrosoftCallQuality.pqx* file included in the download.

Make sure you have the right CQD access role to access the Power BI reports.

(New!) CQD Teams Auto Attendant & Call Queue Historical Report.pbit	This template provides the following three reports: • Auto Attendant – showing analytics for calls coming into your Auto Attendants. • Call Queue – showing analytics for calls coming into your Call Queues. • Agent Timeline – showing a timeline view of agents being active in Call Queue calls. To learn more, read Use CQD Power BI report to view Auto Attendant & Call Queue Historical Report.
CQD Helpdesk Report.pbit	Integrating building and EUII data, this report is designed to let you drill up from a single user to find the upstream root cause of poor call quality for that user (for example, the user is in a building that's experiencing network problems).
CQD Location Enhanced Report.pbit	Re-imagining CQD SPD location reports. Includes 9 reports, providing Call Quality, Building WiFi, Reliability, and Rate My Call (RMC) information with additional drill-thrus by Building or by User. Make sure you upload the building data to maximize your reporting experience.
CQD Mobile Device Report.pbit	Provides insights specifically tuned towards mobile device users, including Call Quality, Reliability, and Rate My Call. View mobile network, WiFi network, and mobile operating system reports (Android, iOS).
CQD PSTN Direct Routing Report.pbit	Provides insights specific for PSTN calls that go through Direct Routing. To learn more, read Using the CQD PSTN Direct Routing Report.

CQD Summary Report.pbit	Better visualizations, improved presentation, increased information density, and rolling dates. These reports make it easier to identifier outliers. Drill into call quality by location with an easy-to-use interactive map. 9 new reports: - Quality Overall - Reliability Overall - RMC (Rate My Call) Overall - Conference Quality - P2P Quality - Conference Reliability - P2P Reliability - Conference RMC - P2P RMC
(New!) CQD Teams Utilization Report.pbit	Shows how users in your organization are using Teams and how much. Make sure you upload the building data to maximize your reporting experience. To learn more, read Use CQD Power BI report to view Microsoft Teams utilization.
CQD User Feedback (Rate My Call) Report.pbit	Shows Rate My Call data in a way that you can easily use to help support calling for your organization. Cross reference with verbatims to identify end user education opportunities.

TIP

Once you've set up your Power BI reports for CQD data, add them as a tab to a channel. After you select + in a channel, select **Power BI** and then find your report. To learn more, read Embed report with the Power BI tab for Teams. Remember, only people with a Power BI license and CQD admin credentials can access these reports.

Related topics

Dimensions and measures available in Call Quality Dashboard

Stream Classification in Call Quality Dashboard

Set up Skype for Business Call Analytics

Use Call Analytics to troubleshoot poor call quality

Call Analytics and Call Quality Dashboard

Install Power BI Connector to use CQD query templates

8/6/2020 • 10 minutes to read • Edit Online

Before you can use the Power BI query templates (PBIX files) for Microsoft Teams Call Quality Dashboard (CQD), you'll need to install the Power BI Connector for Microsoft CQD, using the *MicrosoftCallQuality.pqx* file included in the download.

Read Use Power BI to analyze CQD data for Teams to learn about these templates.

Make sure you have the right CQD access role to access the Power BI reports.

Installation

The process for installing a custom connector and adjusting security to enable use of the connector is described in detail in the Power BI documentation. For the sake of simplicity, here's a quick explanation:

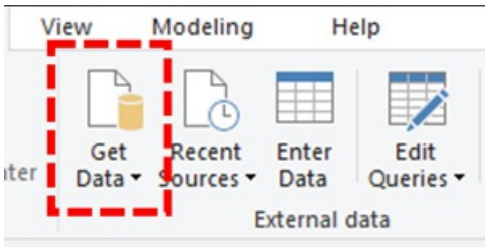
1. Check to see if your computer already has a *[Documents]\Power BI Desktop\Custom Connectors* folder. If not, create this folder.[1]
2. Download the connector file (either a **.mez* or **.pqx* file) and place it in the *Custom Connectors* directory.
3. **If the connector file is a **.mez* file,** you will also need to adjust your security settings as described in the custom connector setup documentation.

If a new version of this Power BI Connector for Microsoft Teams is released, simply replace the old connector file in the *Custom Connectors* directory with the new file.

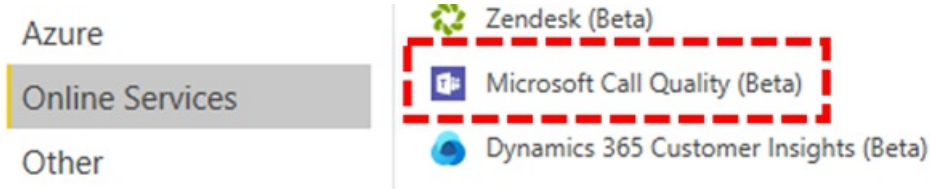
Setup

In order to build a report and run queries, you will first need to connect to the CQD data source. Follow the steps below in order to connect:

1. In the Home tab of Power BI Desktop, click on *Get Data*.



2. The *Get Data* window should appear at this point. Navigate to *Online Services*, then select *Microsoft Call Quality (Beta)* and hit *Connect*.



3. You will be prompted to login next. Use the same credentials that you use for CQD.[2]

4. The next prompt will give you the option between two *Data Connectivity modes*. Select *DirectQuery* and hit *OK*.

5. Finally, you will be given a final prompt showing you the entire data model for CQD. No data will be visible at this point, only the data model for CQD. Select *Load* to complete the setup process.

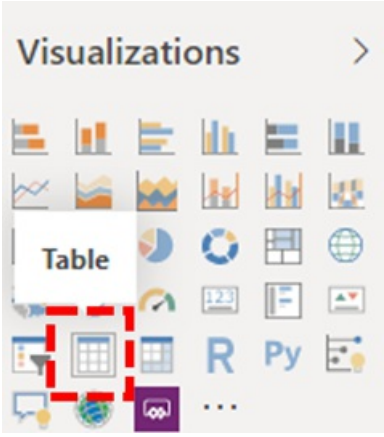
6. At this point, Power BI will load the data model onto the right side of the window. The page will remain otherwise blank, and no queries will be loaded by default. Proceed to **Building Queries** below in order to build a query and return data.

If any of the steps during this setup process were not completely clear, a more detailed explanation of the process can be found here.

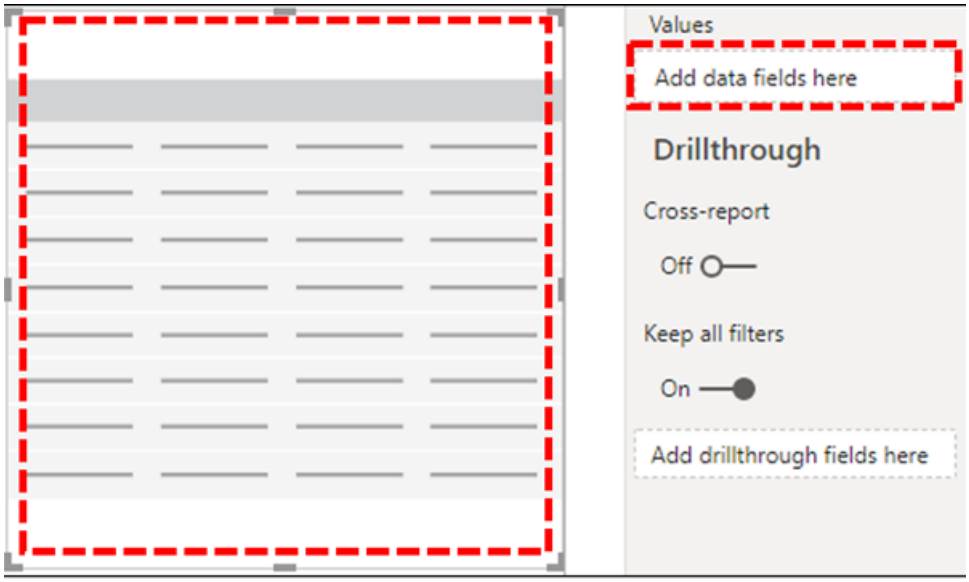
Building Queries

Once setup is complete, you should see the names of several hundred dimensions and measures load in the *Fields* pane. Constructing actual queries from here is simple, just select the dimensions and measures you want for your query, then drag and drop them onto the page. Here's a more detailed explanation, with a simple example:

1. Select the visualization you want to use from the *Visualizations* pane. A blank version of that visualization should appear on the page. For the purposes of this example, we will be using the *Table* visualization.

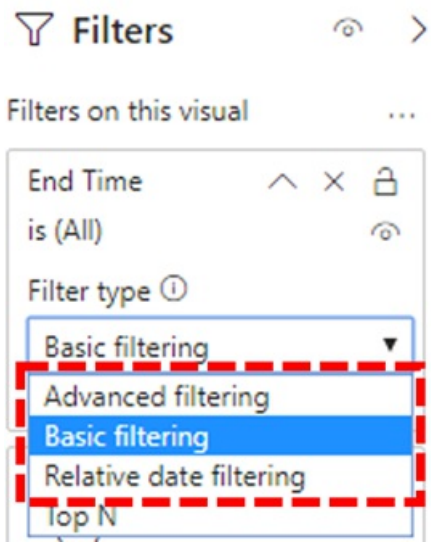


2. Determine which dimensions and measures (denoted by an aggregation symbol by their name) you wish to use for your query, then manually select them and drag them onto the black visualization. Alternately, drag them onto the *Values* field beneath the visualization options.



> **IMPORTANT**
>
> Call Quality Dashboard requires a measure for any query to run. Failure to add a measure to a query will cause that query to fail.

3. Next, select any dimensions you want to filter on and drag them to the *Filters on this visual* field in the *Filters* pane. The CQD Power BI Connector currently supports *Basic filtering* (select values from a list of possible dimension values), *Advanced filtering* (manually specify values and operands to filter on, similar to Advanced CQD), and *Relative date filtering* (only available for the *End Time* and *Start Time* dimensions). Filtering according to *Top N* is not supported by CQD.



4. Finally, select the *Format* tab within the *Visualizations* pane to style and format your query.

> **NOTE**
>
> CQD queries require at least one measure in order to run. If your query does not load, double check that you have included a measure in the query.

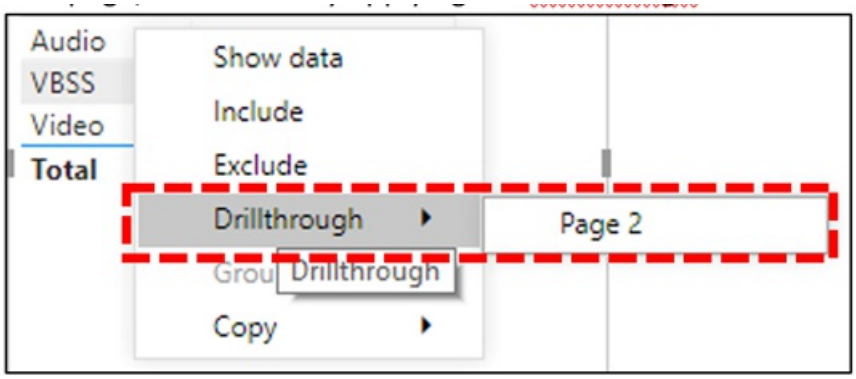
Creating a Drillthrough Report

Drillthrough in Power BI allows you to create focused reports that you can quickly filter using the values of other reports as context. Once you know how to create your first query with the CQD Connector, creating a drillthrough is even simpler.

1. Create another page for the focused report, and then add your queries to that page.
2. Select the dimension you want to use as a drillthrough filter and drag them onto the *Drillthrough* field under on the *Visualizations* pane.



3. **That's it!** Any other query on another page that uses that dimension can now drillthrough to that page, automatically applying the drillthrough dimension's value as a filter.



Unlike Advanced CQD, Power BI supports non-sequential drillthrough. So long as a query includes the necessary dimension, it can drillthrough to any other page.

Best practice

Call Quality connector queries should be designed with drillthrough functionality in mind. Instead of trying to load all the data at once, and then slicing down with filters, start with broader, low-cardinality queries and drill down to high-cardinality queries. For instance, when attempting to diagnose which subnets contribute most to quality issues, it's helpful to first identify those regions and countries which contribute to the problem, then drill down to the subnets in that region or country. The Call Quality connector templates have been designed in this manner in order to act as an example.

Limitations

Despite making use of Power BI, not all Power BI functionality is support by the CQD Connector, either as a result of limitations on CQD data model or on DirectQuery connectors in general. The list below notes some of the Connector's more noteworthy limitations, but this list should not be considered exhaustive:

1. **Calculated Columns** – DirectQuery connectors in general have limited support for calculated columns in Power BI. While some calculated columns may work with the Connector, these should be considered exceptions. As a general rule, calculated columns will not function.

2. **Aggregations** – The CQD data model is built on a cube model, meaning that aggregations are already supported in the form of measures. Attempting to manually add aggregations to different dimensions or changing the aggregation type of a measure will not work with the Connector, and it will generally result in an error.

3. **Custom Visuals** – While the CQD Connector does work with a range of custom visuals, we are unable to guarantee compatibility with all custom visuals. Many custom visuals rely on the use of calculated columns or imported data, neither or which are supported by DirectQuery connectors.

4. **Referencing Cached Data** – Power BI currently does not support referencing cached data from a DirectQuery connector in any way. Any attempt to reference the results of a query will result in a new query.
5. **Relative Data Filtering** – Is supported in the CQD Connector, but only with the *Start Time* and *End Time* dimensions. Although the *Date* dimension may be the obvious choice for relative date filtering, *Date* is not stored as a date time object and thus does not support relative date filtering in Power BI.
6. **Government Community Cloud (GCC) Support** – For customers in the GCC environment, the CQD Power BI Connector will work when using Power BI Desktop. The CQD Power BI connector is not currently compatible with the Power BI service for GCC customers.

Most of these issues are either restrictions to DirectQuery connector design in Power BI or fundamental to the design of the CQD data model.

Troubleshooting

I'm trying to use the Date column as a Date slicer. As soon as I convert the data type of this column to Date, I get this error

> **Couldn't load the data for this visual**: OLE DB or ODBC error: [Expression.Error] We couldn't fold the expression to the data source. Please try a simpler expression.

Date slicers aren't supported with the Power BI Connector. To specify a date range, apply two filters to the report, specifying a less than and greater than date.

Alternatively, if the dates you want to view are recent, apply a relative date filter to show only data for the last N days/weeks/months.

Error Codes

Because the CQD Power BI Connector is less restricted than the browser app in terms of kinds of queries you can construct, you may occasionally encounter a number of errors while building your queries. In the event that you receive an error message of the type "CQDError. RunQuery – Query Execution Error", reference the list below with the ErrorType number provided in order to troubleshoot the possible issue with the query. The following are the most common Error Type codes you may encounter with the CQD Power BI Connector:

- **ErrorType 1 - Query Structure Error:** A query structure error is typically caused by the Connector failing to build a properly formatted query. This happens most often when using unsupported functionality, as specified in the Limitations above. Double check that you are not using any calculated columns or custom visuals for that query.
    - **ErrorType 2 - Query Building Error:** A query building error is caused by the CQD Connector being unable to properly parse the query you are attempting to build. This happens most often when using unsupported functionality, as specified in the Limitations above. Double check that you are not using any calculated columns or custom visuals for that query.
    - **ErrorType 5 - Execution Timeout:** The query has reached the maximum possible runtime before timing out. Try adding more filters to the query in order to limit its scope. Narrowing the data range is often the most effective way to achieve this.
    - **ErrorType 7 - No Measurements Error:** CQD queries require a measure in order to function. Double check that your query includes measure. Measures in the CQD Connector are denoted by the aggregation (sum) symbol before their name.

If you encounter any additional errors outside of this scope, please notify the CQD team so that we can help troubleshoot the issue and update the documentation as appropriate.

Footnotes

[1] Certain processes and apps (e.g., OneDrive) may cause your Documents root folder to change; make sure that the *Power BI Desktop\Custom Connectors* directory is placed inside of the current root folder Documents folder.

[2] The login credentials you use for CQD *do not* need to be the same credentials you use for logging into the Power BI Desktop app itself.

Frequently asked questions

When will the Power BI Connector be updated from "Beta" status

Despite the Beta tag, the Call Quality Connector for Power BI is the release version of the connector and has been officially security signed by the Power BI team to reflect this. The certification process to remove that Beta tag is an extensive one and requires a commitment from the Power BI team to provide direct support to the connector as well. Due to time constraints, the Power BI team is currently unable to provide that support and broader certification, but is still prepared to attest to the security, authenticity, and general functionality of the Microsoft Call Quality connector.

Why does the connector seem slower compared to Advanced CQD in the browser? What can I do to improve performance

Query performance for the various templates is actually the same in both the browser and in the connector. Just like any other standalone app, Power BI adds its authentication and rendering time to our performance. In addition, the difference comes in the number of concurrent queries being run. Because the in-browser version of CQD had less well-developed and information-dense visualization options, most of our reports were limited to loading 2-3 queries at a time. On the other hand, the connector templates often display 20+ concurrent queries. If you wish to build reports that are just as responsive as the older ones you were used to, try creating reports with no more than 2-3 queries per tab.

For more information, see the following articles:

- Optimization guide for Power BI
- DirectQuery model guidance

I find that I routinely run into the 10,000-row limit when running queries. How can I get the connector to return more than 10,000 rows

The 10,000-row limit is actually specified on the API end, and it is designed to help significantly improve performance and reduce the risk of query execution errors resulting from low memory conditions.

Instead of attempting to increase the result row count, it is best to restructure your reports according to connector best practices. The templates we have included are designed to demonstrate these best practices. Where possible, start by looking at your KPIs using broader, lower-cardinality dimensions, such as Month, Year, Date, Region, Country, etc. From there, you can drill down into increasingly higher-cardinality dimensions. The Helpdesk and Location-Enhanced Reports both provide good examples of this drill down workflow.

Related topics

Use Power BI to analyze CQD data for Teams

View Microsoft Teams utilization in Power BI using CQD data

8/6/2020 • 6 minutes to read • Edit Online

New in March 2020, we've added a Teams Utilization report to our downloadable Power BI query templates for CQD.

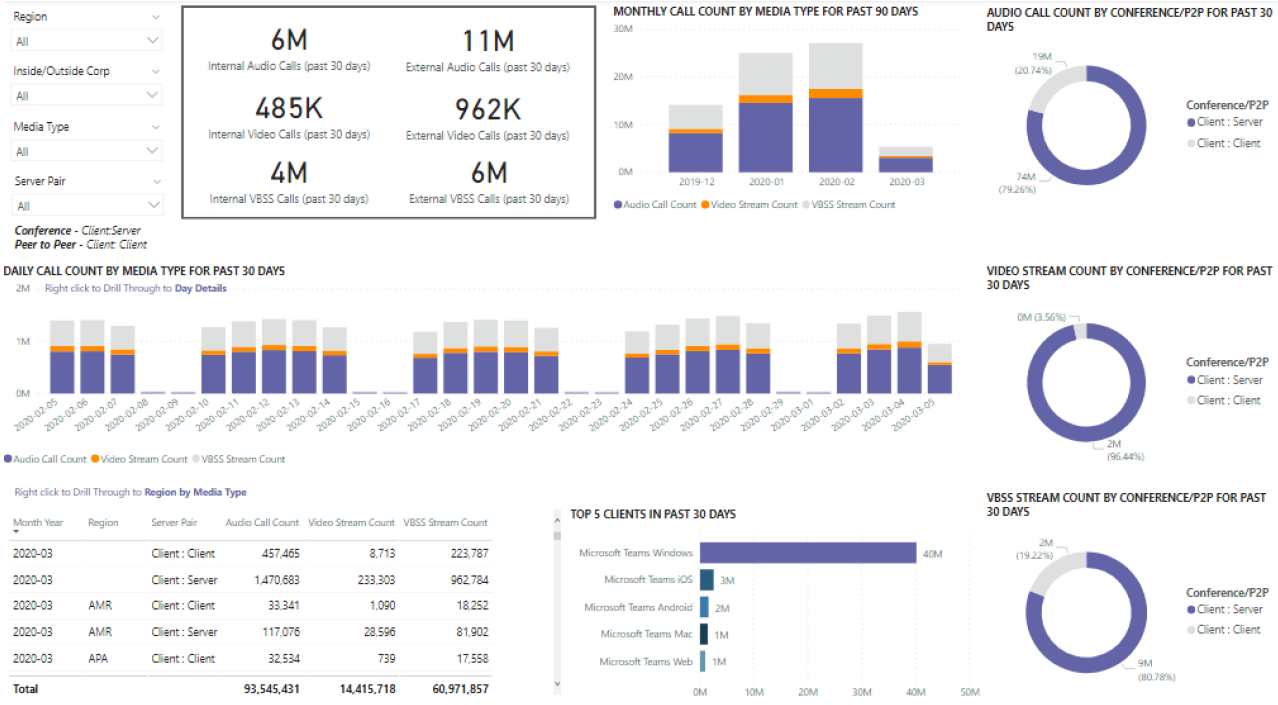
This new Teams Utilization reports lets you see how (and how much) your users are using Microsoft Teams by accessing Teams Call Quality Dashboard (CQD) data. These reports are intended to be a centralized location that both administrators and business leaders can quickly go to for this data.

The Teams Utilization Power BI report consists of two primary reports: **Call Count Summary** and **Audio Minutes Summary**. The Daily Usage, Regional Audio Details, Conference Details and User List reports come into play when a user takes advantage of the drill-down reports, noted in the descriptions below.

> **NOTE**
>
> Building and subnet data must be populated to provide regional and network filtering capabilities.

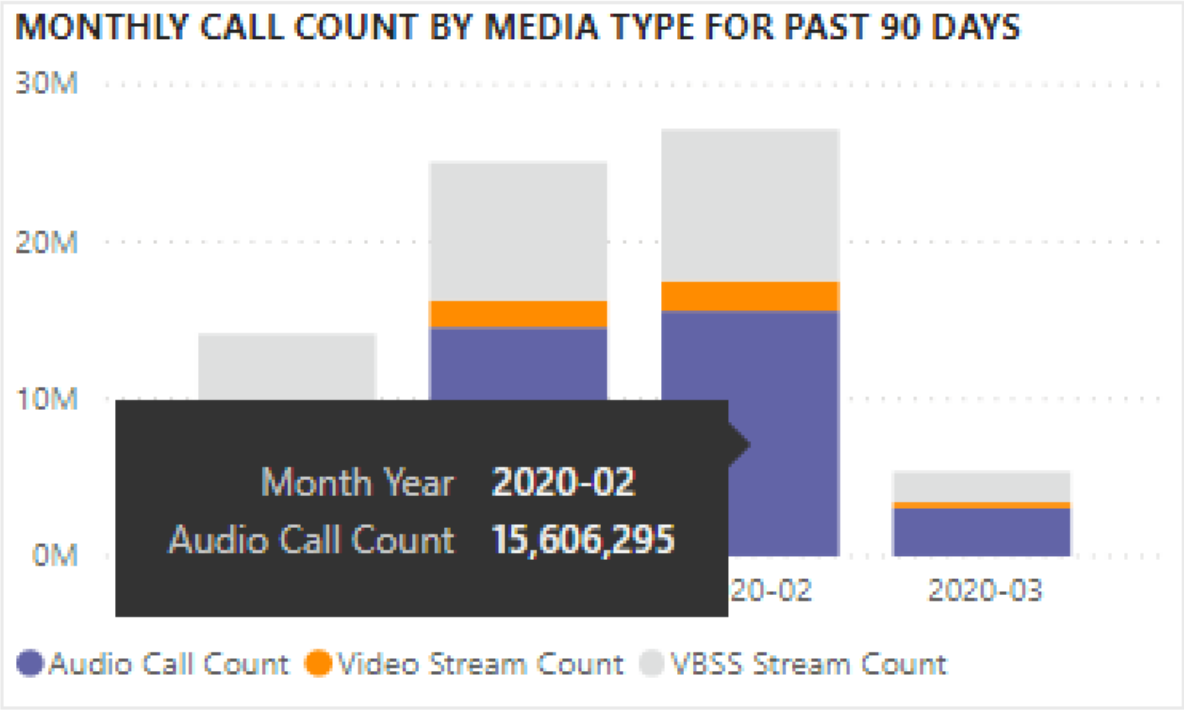
Call Count Summary Report

The main page (Call Count Summary) immediately provides the number of audio, video and screen sharing sessions over the last 30 and 90 days as noted in the section title. The data initially displayed is for the organization as a whole and can be filtered using the slicer dropdown options on the left side of the page.

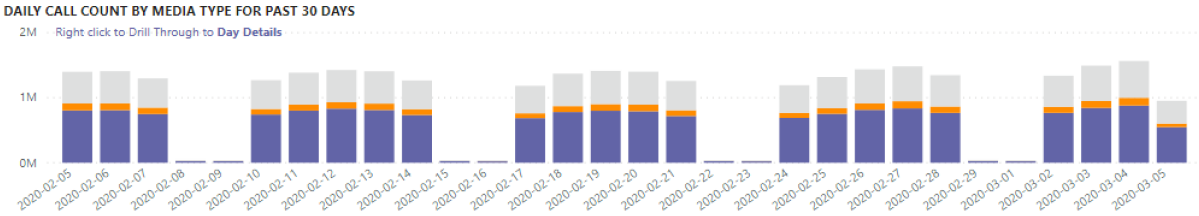


Month Year	Region	Server Pair	Audio Call Count	Video Stream Count	VBSS Stream Count
2020-03		Client : Client	457,465	8,713	223,787
2020-03		Client : Server	1,470,683	233,303	962,784
2020-03	AMR	Client : Client	33,341	1,090	18,252
2020-03	AMR	Client : Server	117,076	28,596	81,902
2020-03	APA	Client : Client	32,534	739	17,558
Total			93,545,431	14,415,718	60,971,857

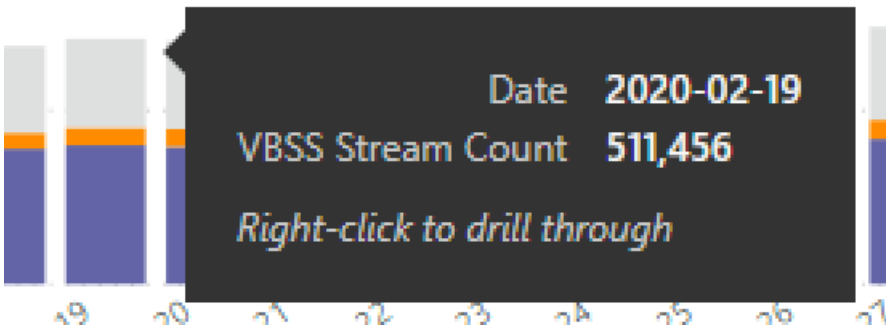
1. To the right of the slicer dropdowns, the number of calls by media type is broken down to an internal/external view over the past thirty days. We can see through the above screenshot that there are more calls happening from outside organizational locations, which makes sense considering the current global environment.



2. To the right of the media type count box, we have the Monthly Call Count by Media Type for the last 90 days. Each column and media type can be hovered over to display the count for a previous month or the current month to date, providing usage trend information.



3. The middle graph functions as the 90-day graph does, however it provides a daily usage view for the past 30 days and allows a user to right click and drill down into details for a specific day.



On the bottom left section of the page, you'll find a table providing total values for each media type over the past year.

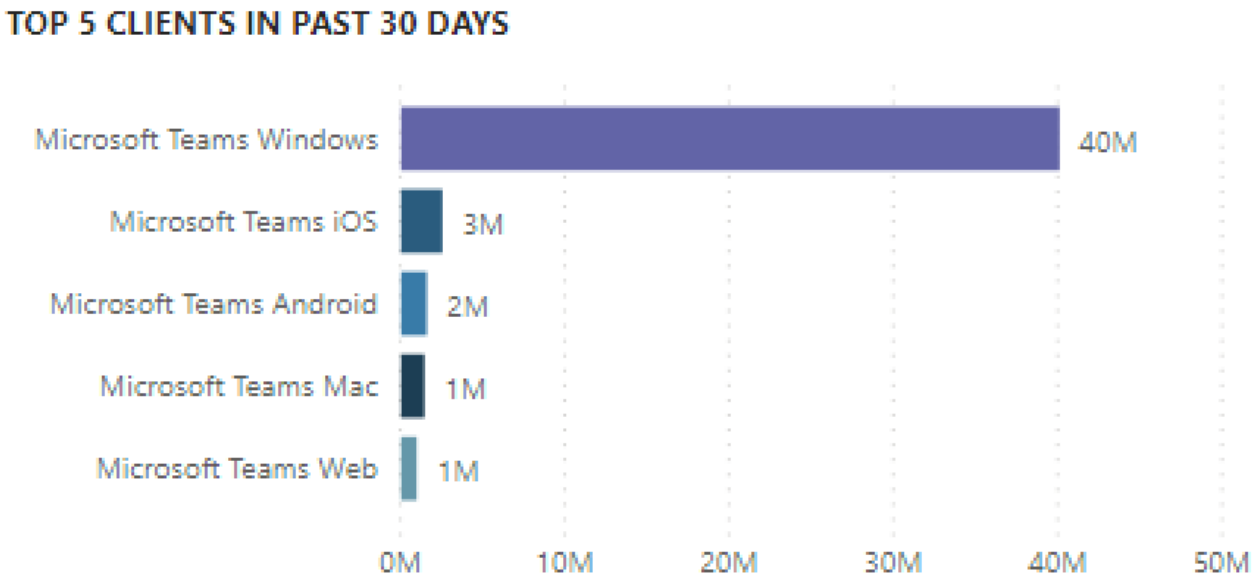
Month Year	Region	Server Pair	Audio Call Count	Video Stream Count	VBSS Stream Count
2020-03		Client : Client	457,465	8,713	223,787
2020-		: Server	1,470,683	233,303	962,784
2020-		: Client	33,341	1,090	18,252
2020-				8,596	81,902
2020-		: Client	32,534	739	17,558
Total			**93,545,431**	**14,415,718**	**60,971,857**

Show as a table
Include
Exclude
Drill through
Group
Copy
Region details on Audio

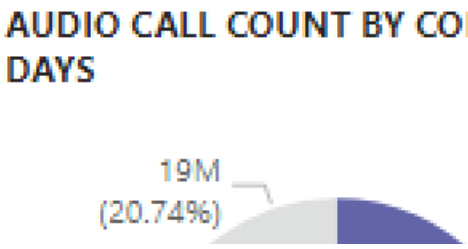
Right click to Drill Through to **Region by Media Type**

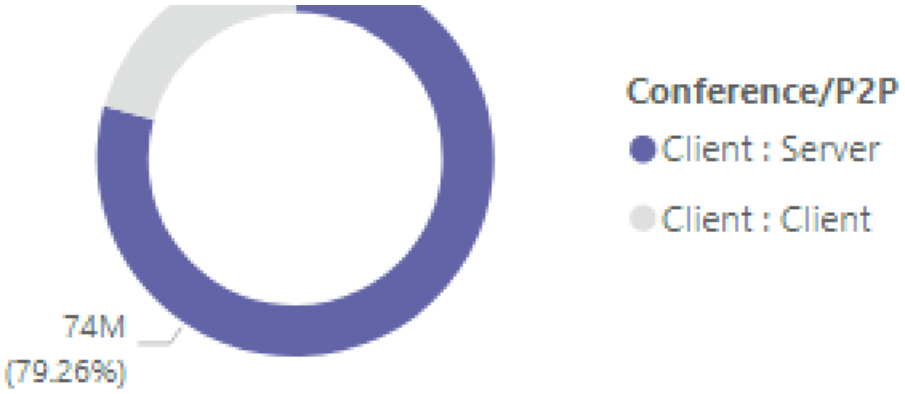
Month Year	Region	Server Pair	Audio Call Count	Video Stream Count	VBSS Stream Count
2020-03		Client : Client	457,465	8,713	223,787
2020-03		Client : Server	1,470,683	233,303	962,784
2020-03	AMR	Client : Client	33,341	1,090	18,252
2020-03	AMR	Client : Server	117,076	28,596	81,902
2020-03	APA	Client : Client	32,534	739	17,558
Total			**93,545,431**	**14,415,718**	**60,971,857**

To the right of the table, a bar chart shows clients with the most use (calls/streams) for the past 30 days.

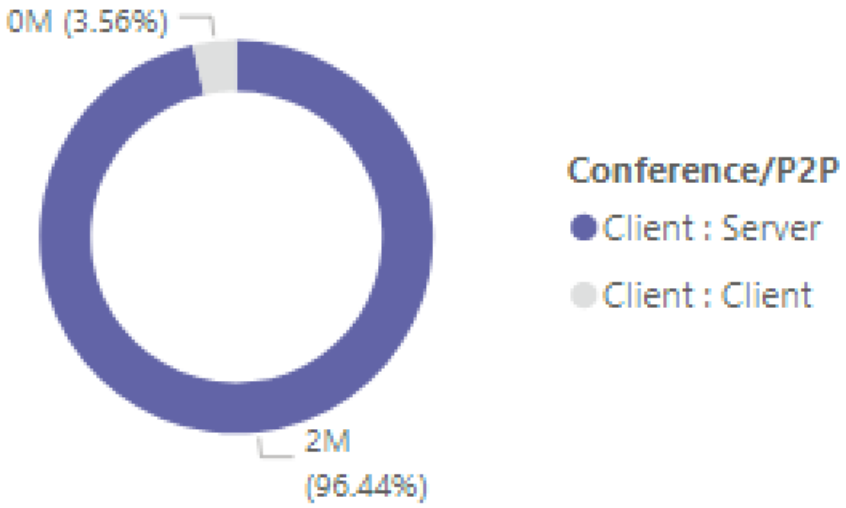


The last set of charts for this page show each media type individually, with a breakdown showing conference and P2P usage. The charts below show that there is a significantly higher number of conference usage as compared to

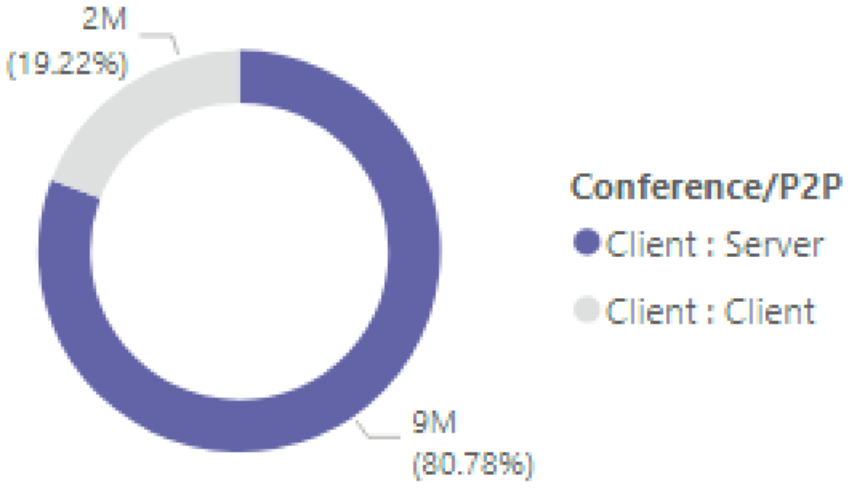




VIDEO STREAM COUNT BY CONFERENCE/P2P FOR PAST 30 DAYS



VBSS STREAM COUNT BY CONFERENCE/P2P FOR PAST 30 DAYS

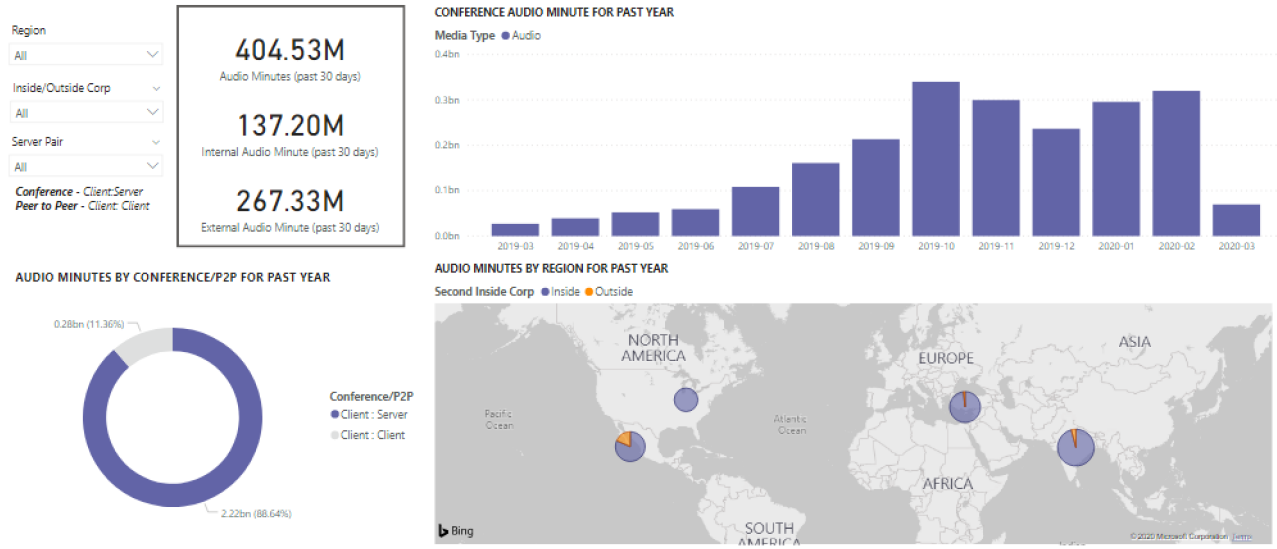


P2P.

Audio Minutes Summary Report

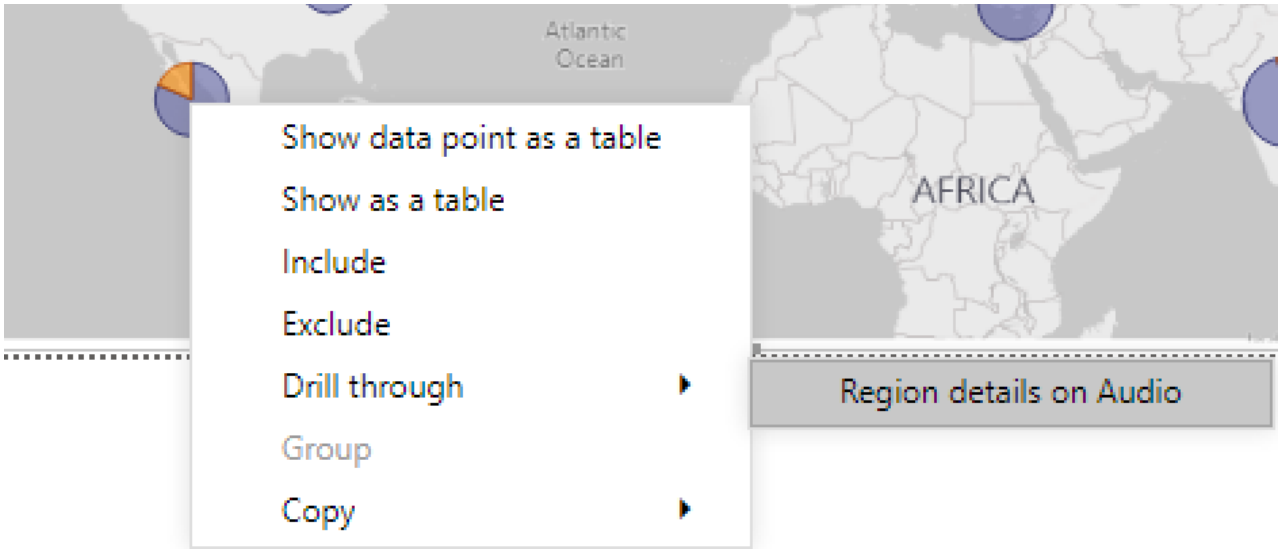
On the Audio Minutes usage report, the total minute usage is provided through a few different views.

We have the thirty-day usage summary shown next to the slicers as easy to consume text boxes. The top number shows the thirty-day total, with internal and external breakdowns below that.

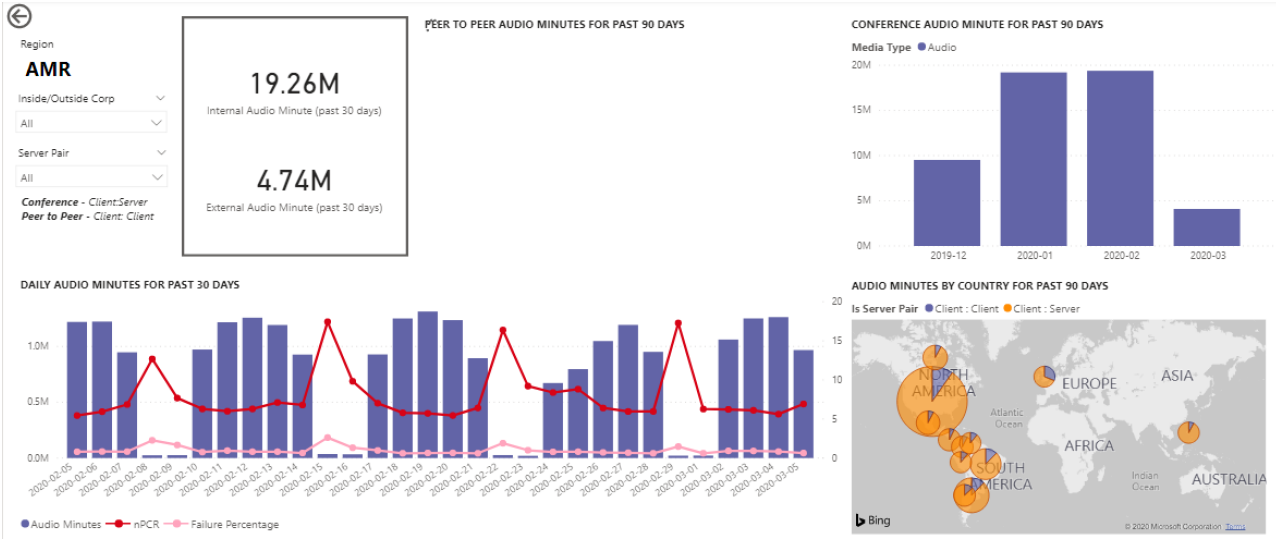


The top right bar graph provides a yearlong view of conference audio usage. Hover over the month to show the conference audio minutes.

To show the difference in P2P and conference audio, the bottom left chart takes all audio for the past year and breaks it up between the two types.



The last chart for the Audio minutes page shows audio minute usage on a global map overlay. This chart will only work if building and subnet data is uploaded to the tenant. The pie chart overlay on the map can be drilled into, subsequently providing regional audio usage.

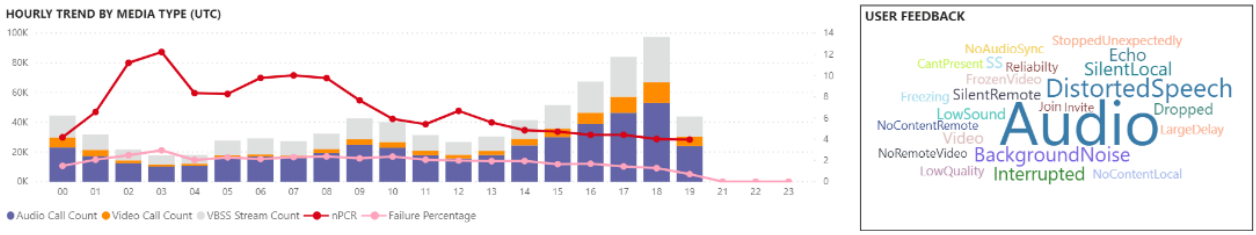


Drill-through capabilities

As previously noted, users can drill into the daily and regional usage reports.

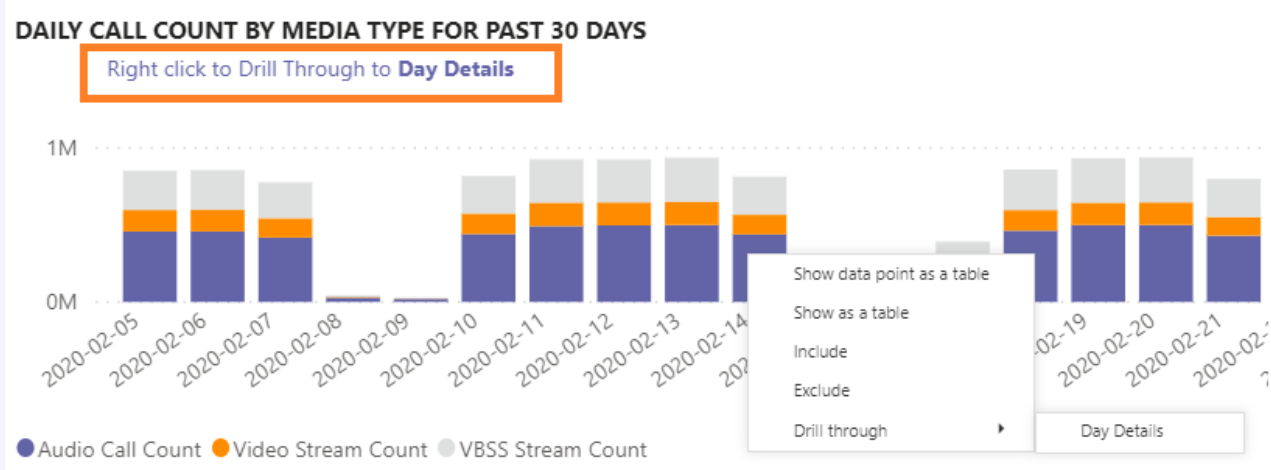
Daily Usage

The Daily Usage report allows an administrator to identify peak consumption periods through the course of a day. In addition to usage, we are also able to capture overall user sentiment and feedback for that day.



Hour	Region	Media Type	Server Pair	Audio Call Count	Video Call Count	VBSS Stream Count	nPCR	Setup Failure Rate	Dropped Failure Rate	User Rating Count	Avg Rating	Rating Poor Percent
00		Audio	Client : Client	2,373	0	0	4.75	0.31	0.71	64	4.50	9.38
00		Audio	Client : Server	11,548	0	0	3.39	0.16	1.67	348	4.76	4.60
00		VBSS	Client : Client	0	0	903	1.15	0.00	4.54	12	4.92	0.00
00		VBSS	Client : Server	0	0	7,669	2.04	0.03	2.10	120	4.84	2.50
00		Video	Client : Client	0	186	0	3.68	0.00	2.85	4	5.00	0.00
00		Video	Client : Server	0	3,638	0	4.30	0.07	2.88	120	4.72	5.00

The Daily usage report displays the number of Audio, Video and Screen shares for the selected day with the added ability to differentiate between internal and external connectivity. A Conference and Peer to Peer breakdown is to the immediate right of the modality total box. The top right of the report provides a list of conferences with their associated ID and participants for the day. The conference list provides an additional drill down to the Conference Details report as well. REPLACE GRAPHIC



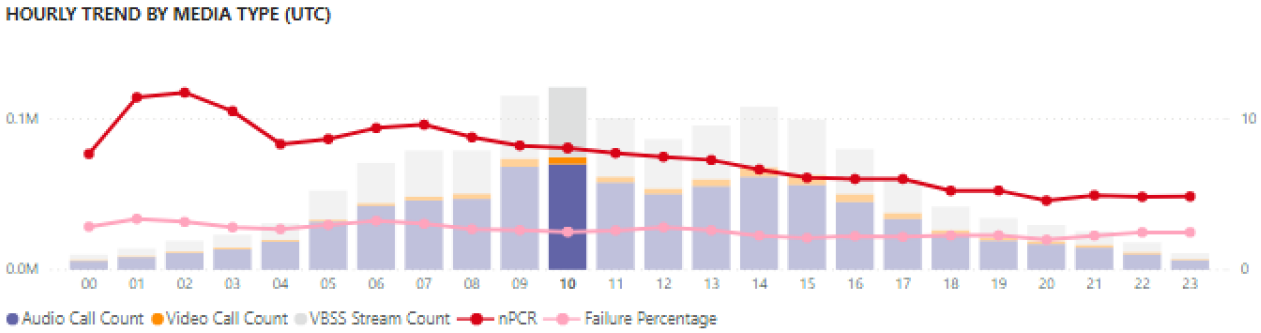
The bar graph in the center area allows the user to identify peak consumption periods through the course of a day. Users may drill down into the hour represented on the graph which will present the User List report for the hour.

To the right of the bar graph, User Feedback is presented in a visual format. While user sentiment can be subjective, it does provide insight that can be used to identify potential issues.

The bottom table provides a range of metrics for the day. Poor percentages along with failure rates can provide an administrator with potential areas of improvement. Each hour can also be selected individually as shown below.

This data can be used to identify regions having problems during peak consumption times.

Click on the column for that day to display metrics for that hour.



1. The table below the chart will display the metrics for that hour. This can be sorted by any column header; however, we would be interested in finding problematic areas.

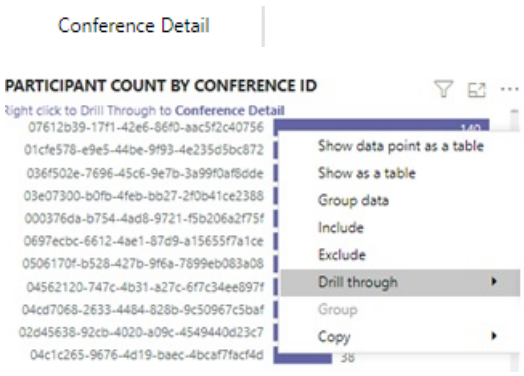
Hour	Region	Media Type	Server Pair	Audio Call Count	Video Call Count	VBSS Stream Count	nPCR	Setup Failure Rate	Dropped Failure Rate	User Rating Count	Avg Rating	Rating Poor Percent
10		Video	Client : Server	0	2,614	0	11.39	0.11	2.57	45	4.58	8.89
10		Audio	Client : Server	28,016	0	0	5.84	0.32	1.30	500	4.54	8.40
10		Audio	Client : Client	10,339	0	0	10.99	0.79	1.66	320	4.74	6.88
10		VBSS	Client : Server	0	0	19,011	4.37	0.03	1.59	188	4.61	6.38
10		VBSS	Client : Client	0	0	5,103	4.07	21.44	8.18	78	4.81	3.85
10	AMR	Video	Client : Client	0	4	0		40.00	0.00	0	NaN	NaN
10	APA	Video	Client : Client	0	13	0	7.69	14.29	0.00	0	NaN	NaN
10	IND	Video	Client : Server	0	746	0	12.98	0.00	0.51	15	3.93	26.67
10	IND	Audio	Client : Server	13,308	0	0	2.69	0.03	0.14	362	4.76	3.87
10	IND	VBSS	Client : Server	0	0	10,100	3.80	0.00	0.30	140	4.84	2.14
10	IND	Audio	Client : Client	6,136	0	0	8.07	0.28	0.69	224	4.79	1.79

2. We see that the IND region is experiencing poor video performance in conferences during this time frame. Subsequently, the CQD QER Microsoft reports can be used to narrow down the problematic location as the region and time frame has been identified.

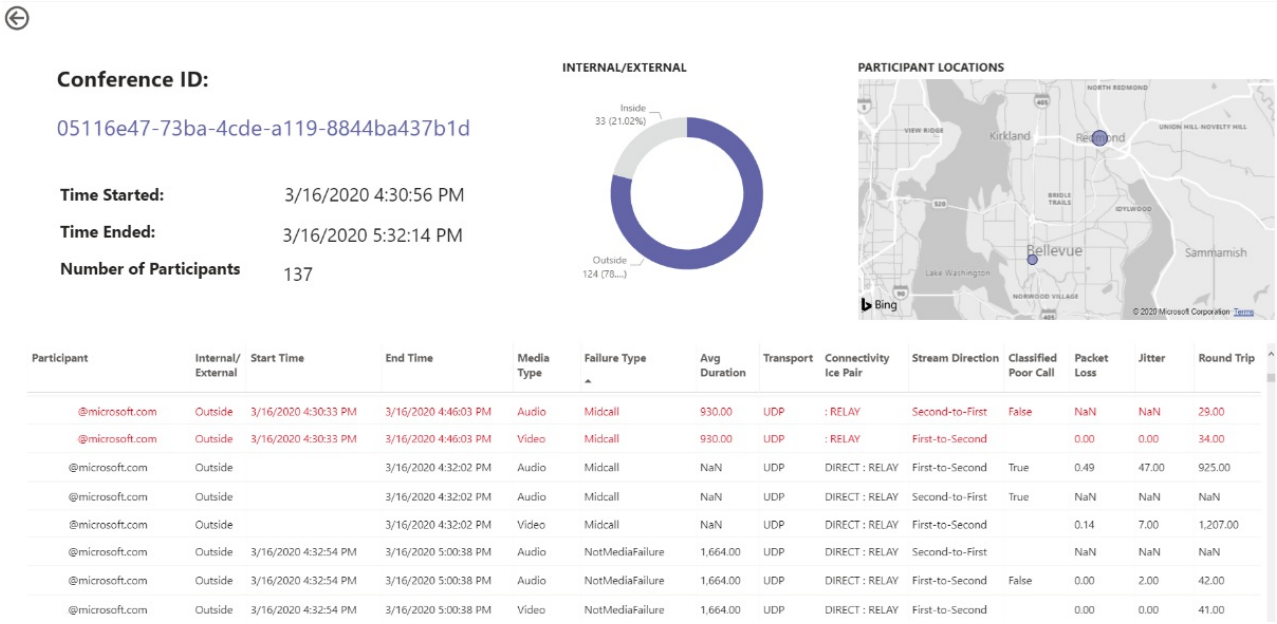
Conference Details

The Conference Details report provides additional insight for meetings, from an attendee list, to the media types used during the session.

Right click a conference the participant bar in the conference ID chart on the Daily usage page to drill down into the conference details.



We can see the participants in the conference as well as all the pertinent information down to packet loss and jitter to assist with potential troubleshooting efforts in the bottom table.

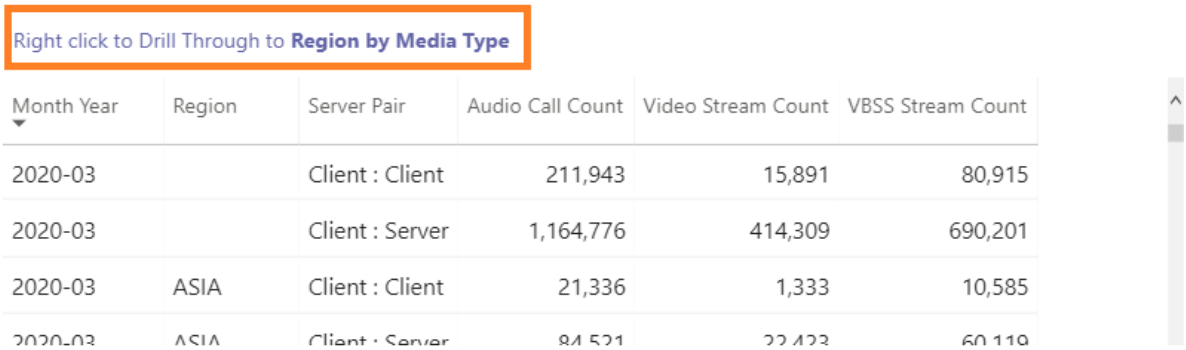


Participant	Internal/ External	Start Time	End Time	Media Type	Failure Type	Avg Duration	Transport	Connectivity Ice Pair	Stream Direction	Classified Poor Call	Packet Loss	Jitter	Round Trip
@microsoft.com	Outside	3/16/2020 4:30:33 PM	3/16/2020 4:46:03 PM	Audio	Midcall	930.00	UDP	: RELAY	Second-to-First	False	NaN	NaN	29.00
@microsoft.com	Outside	3/16/2020 4:30:33 PM	3/16/2020 4:46:03 PM	Video	Midcall	930.00	UDP	: RELAY	First-to-Second		0.00	0.00	34.00
@microsoft.com	Outside		3/16/2020 4:32:02 PM	Audio	Midcall	NaN	UDP	DIRECT : RELAY	First-to-Second	True	0.49	47.00	925.00
@microsoft.com	Outside		3/16/2020 4:32:02 PM	Audio	Midcall	NaN	UDP	DIRECT : RELAY	Second-to-First	True	NaN	NaN	NaN
@microsoft.com	Outside		3/16/2020 4:32:02 PM	Video	Midcall	NaN	UDP	DIRECT : RELAY	First-to-Second		0.14	7.00	1,207.00
@microsoft.com	Outside	3/16/2020 4:32:54 PM	3/16/2020 5:00:38 PM	Audio	NotMediaFailure	1,664.00	UDP	DIRECT : RELAY	Second-to-First		NaN	NaN	NaN
@microsoft.com	Outside	3/16/2020 4:32:54 PM	3/16/2020 5:00:38 PM	Audio	NotMediaFailure	1,664.00	UDP	DIRECT : RELAY	First-to-Second	False	0.00	2.00	42.00
@microsoft.com	Outside	3/16/2020 4:32:54 PM	3/16/2020 5:00:38 PM	Video	NotMediaFailure	1,664.00	UDP	DIRECT : RELAY	First-to-Second		0.00	0.00	41.00

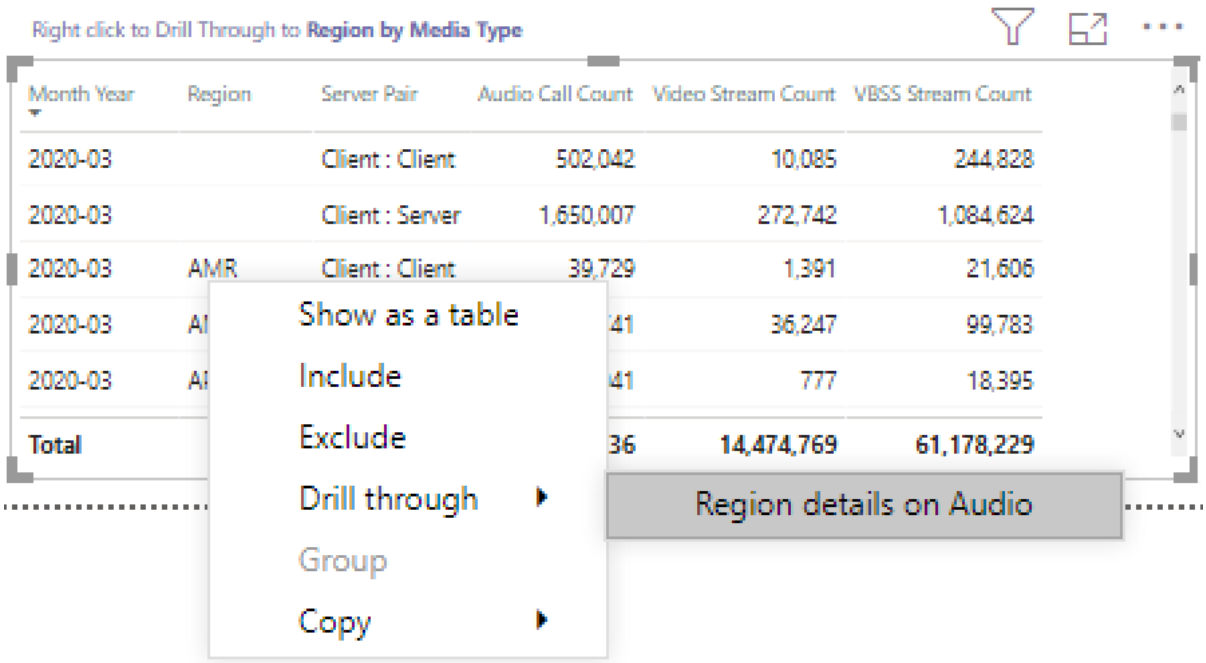
Regional Audio Details

The Regional Audio Details drill down specifically shows the audio minute usage for the selected region. Users with access to CQD can see usage trends for both P2P and conference audio within the selected region.

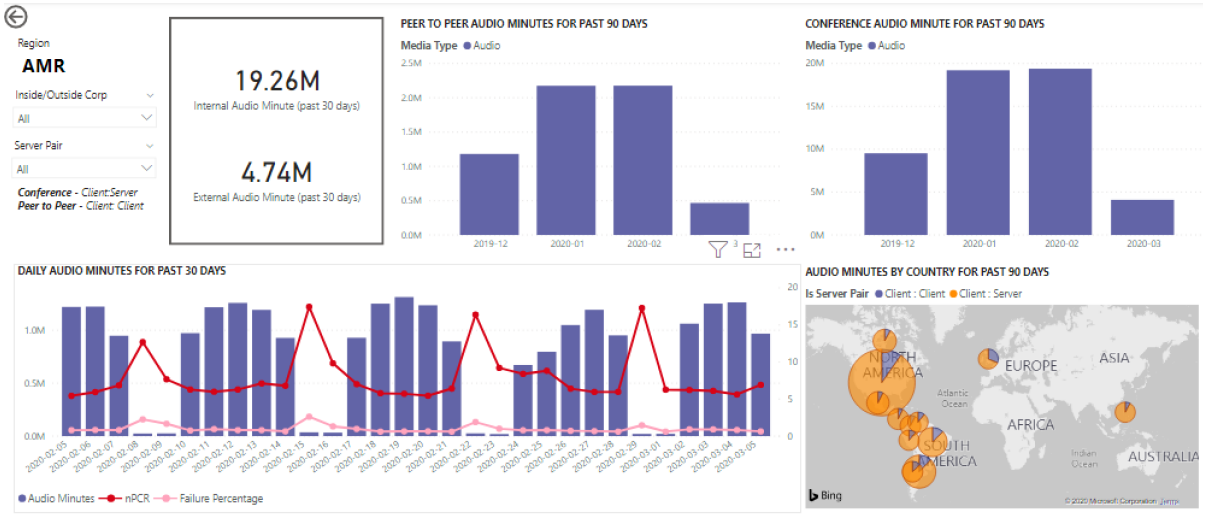
1. On the Call Count Summary page, drill-through to as specific region through the table.



2. Select the row with the region additional information is needed for.



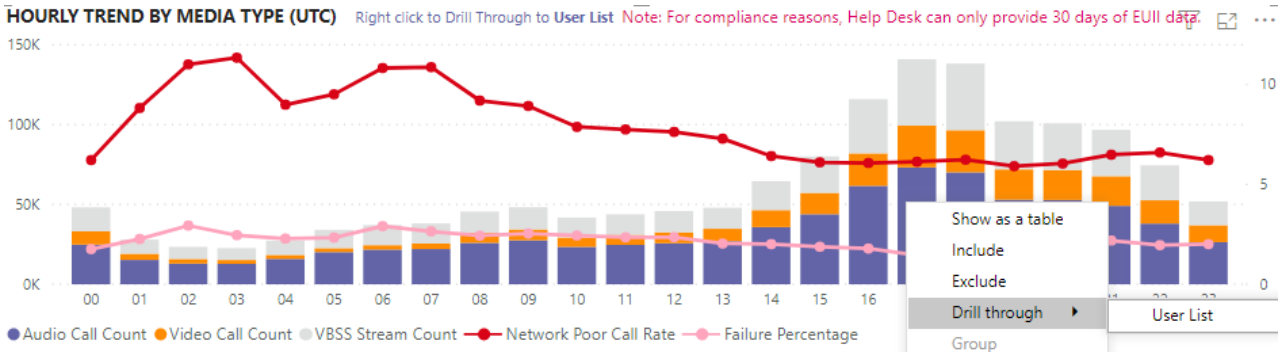
3. The data trends show a significant number of minutes being used on the internal network, with conferencing far surpassing P2P use.



The regional audio trend can be used to show how users are impacted by external influences in the world. Specifically, right now, we would expect to see the external usage for the EMEA and APAC regions to increase with people being asked to work remotely.

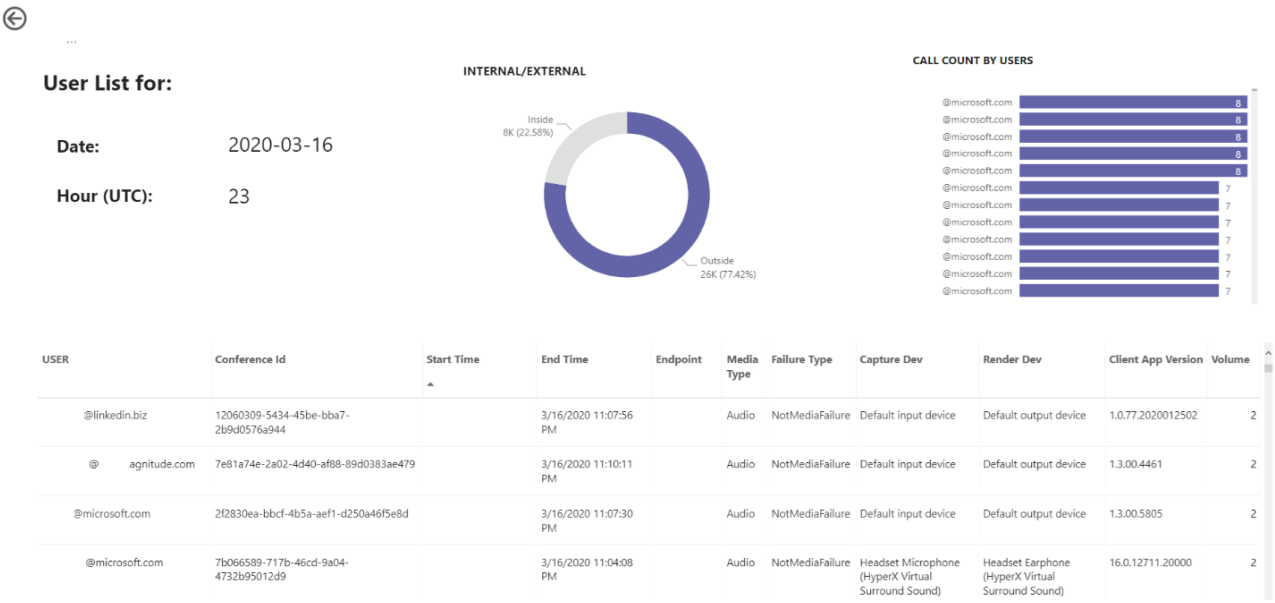
User List

The User List drill down provides, as one might expect, user specific information for a specific hour selected by the person viewing the report. The User List report is accessible through a drill down in the Hourly Trends graph on the Daily Usage report. Right click on the hour additional information is needed for and select Drill through and User List, as shown below.



The User List report shows internal/external connectivity through the doughnut chart in the top center of the page. We can see that there is a large amount of participation from Outside the corporate network in the below image.

The top right of the graph shows the number of calls made by each user within that hour.



USER	Conference Id	Start Time	End Time	Endpoint	Media Type	Failure Type	Capture Dev	Render Dev	Client App Version	Volume
@linkedin.biz	12060309-5434-45be-bba7-2b9d0576a944		3/16/2020 11:07:56 PM		Audio	NotMediaFailure	Default input device	Default output device	1.0.77.2020012502	2
@ agnitude.com	7e81a74e-2a02-4d40-af88-89d0383ae479		3/16/2020 11:10:11 PM		Audio	NotMediaFailure	Default input device	Default output device	1.3.00.4461	2
@microsoft.com	2f2830ea-bbcf-4b5a-aef1-d250a46f5e8d		3/16/2020 11:07:30 PM		Audio	NotMediaFailure	Default input device	Default output device	1.3.00.5805	2
@microsoft.com	7b066589-717b-46cd-9a04-4732b95012d9		3/16/2020 11:04:08 PM		Audio	NotMediaFailure	Headset Microphone (HyperX Virtual Surround Sound)	Headset Earphone (HyperX Virtual Surround Sound)	16.0.12711.20000	2

The bottom table provides detailed information for the sessions each user participated in during that hour. The Failure Type column is useful in determining what caused a call to drop. The Capture and Render Device columns are useful in identifying why a call was reported having poor quality.

Related topics

Dimensions and measures available in Call Quality Dashboard

Stream Classification in Call Quality Dashboard

Set up Skype for Business Call Analytics

Use Call Analytics to troubleshoot poor call quality

Call Analytics and Call Quality Dashboard

Teams Troubleshooting

Using the CQD PSTN Direct Routing report

8/6/2020 • 5 minutes to read • Edit Online

New in March 2020, we've added a Microsoft Teams Call Quality Dashboard (CQD) PSTN Direct Routing report to our downloadable Power BI query templates for CQD.

The CQD PSTN Direct Routing report (CQD PSTN Direct Routing Report.pbit) helps you understand the usage patterns and quality of your PSTN services. Use this report to monitor service usage, information about your Session Border Controller (SBC), the telephony service, network parameters, and Network Effectiveness Ratio details. This information can help you identify issues, including the reason for dropped calls. For example, you'll be able to see when volume drops, or how many calls get affected and for what reason.

The CQD PSTN Direct Routing Report has four sections:

- PSTN Overview
- Service Details
- Network Effectiveness Ratio
- Network Parameters

Highlights

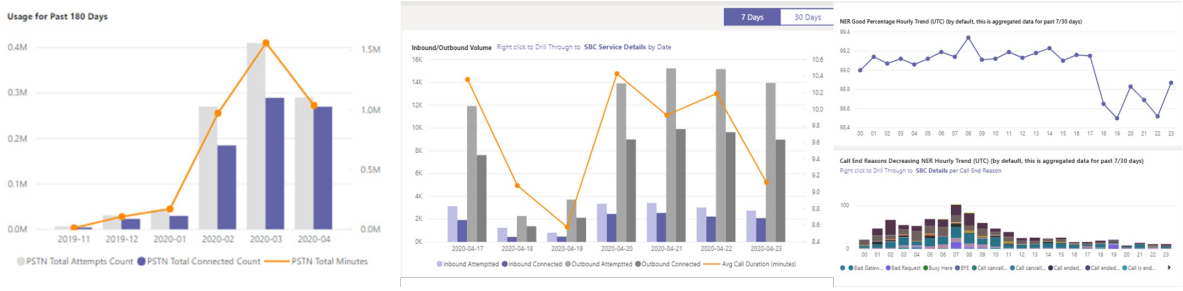
1. Analyze by call type, SBC, caller and callee country

   The CQD PSTN Direct Routing report aggregates reliability and usage metrics for all SBCs on your tenant for the last 7, 30, or 180 days (6 months). You can analyze data by call type, SBC, caller and callee country. If you're interested in a particular SBC or country, you'll be able to identify changes in trends over the selected time range.



2. Track trends

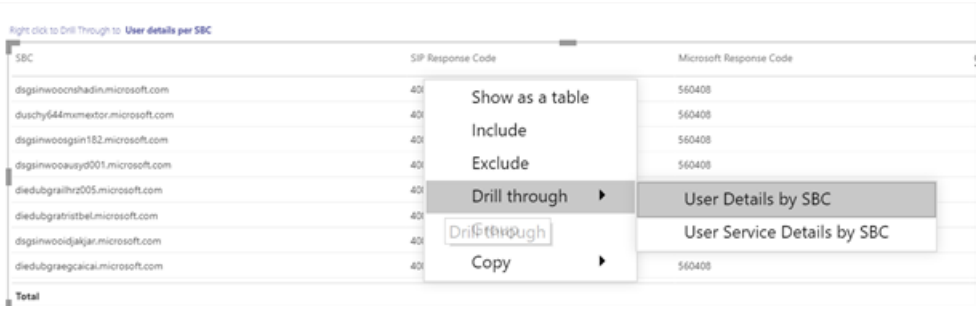
   Trends analysis is essential when trying to understand service usage and reliability. Hourly trends provide a close look at daily performance, which helps identify real-time incidents. Daily trends let you see your service health from a long-term perspective. It's important to be able to shift between those two modes with appropriate data granularity. The CQD PSTN Direct Routing report provides 6-month trends overview, 7- and 30-day daily trends, and hourly trends so you can analyze performance at each level.



3. Drill through to SBC or user level

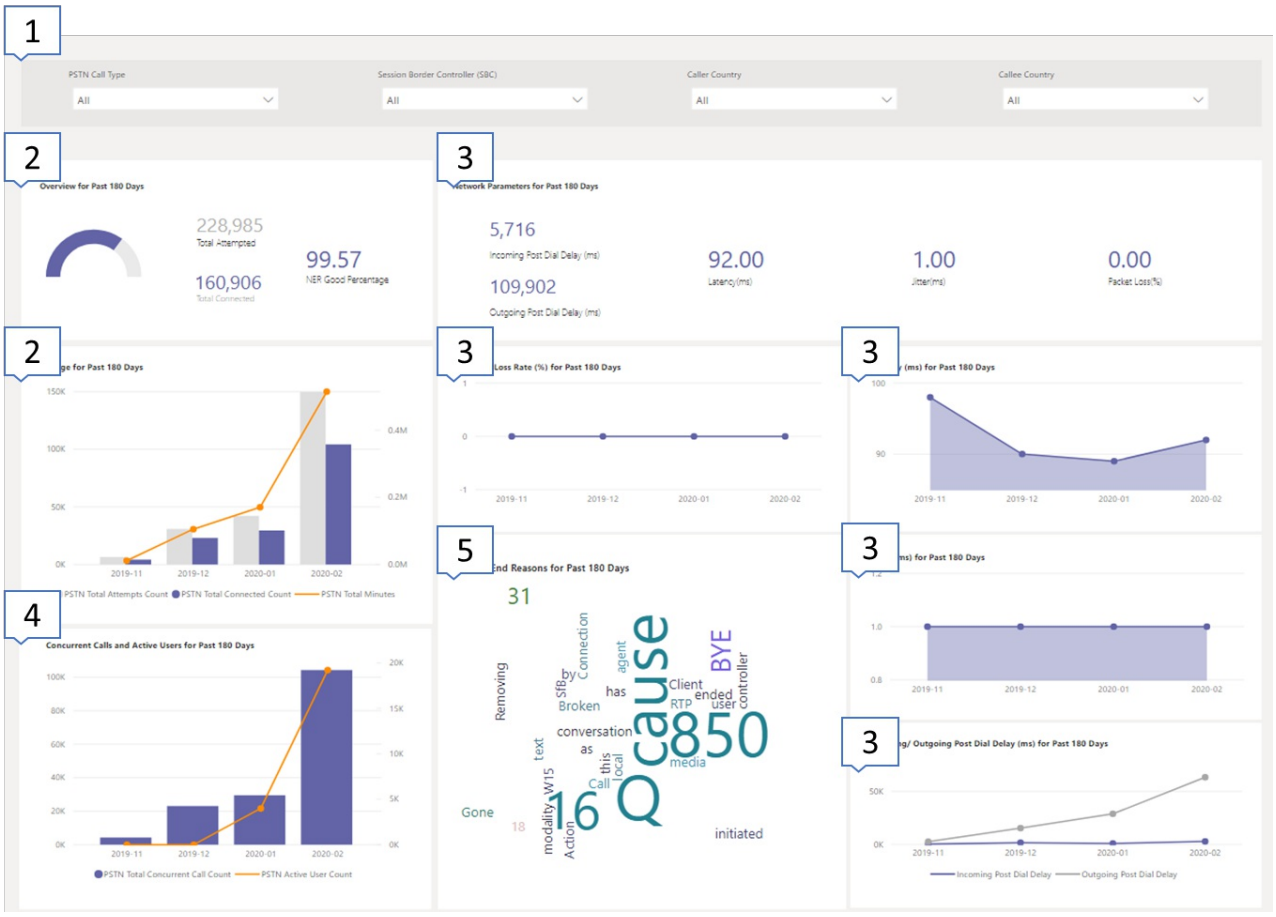
   We've been building in drill-through capability on many data categories in CQD, which lets you quickly understand usage or reliability distribution at the SBC or user level. By using drill through, you can quickly poinpoint issues and understand real user impact. The CQD PSTN Direct Routing report features drill

through on the Service Detail and Network Effectiveness Ratio metrics. Click the data point you're interested in to drill through to SBC- or user-level details.



PSTN Overview

The CQD PSTN Direct Routing Report provides the following information related to overall health of the service for the past 180 days.



For example, if you are interested in the overall usage and health about all inbound calls going through SBC abc.bca.adatum.biz with US as the internal country:

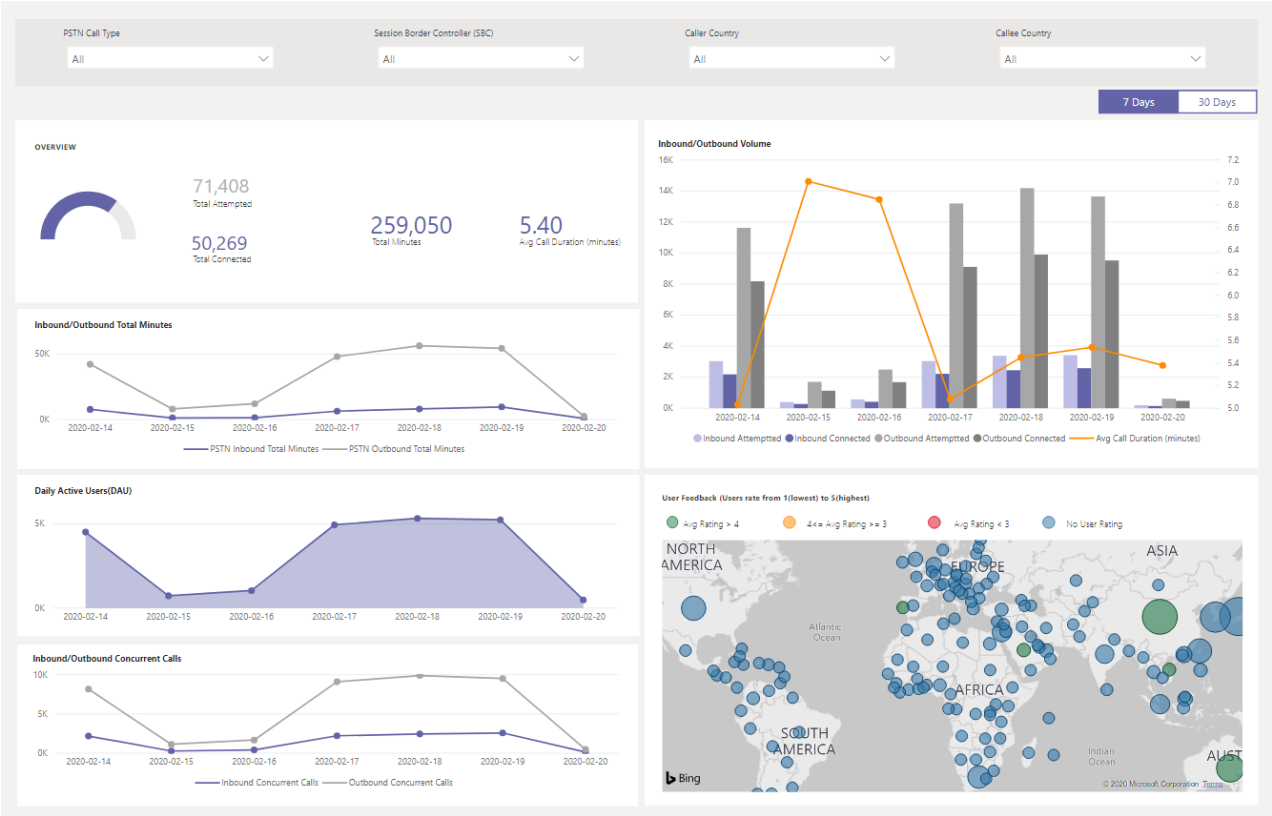
CALL OUT	DESCRIPTION
1	You can use the filters at the top to drill down and select ByotIn as call type, abc.bca.contoso.com as Session Boarder Controller, and US as internal country.
2	Usage trend for the past 180 days. You can find usage detail report on Service Detail page.

CALL OUT	DESCRIPTION
3	Post Dial Delay, Latency, Jitter, and Packet Loss trend for the past 180 days. You can find detail report on Network Parameters page.
4	Concurrent Call and Daily Active User trend for the past 180 days. This chart can help you understand the max volume of the service.
5	Top Call End Reason affected service quality for the past 180 days. You can find service health detail on Network Effective Ratio(NER) page.

Service Details

This page provides service usage trends per day and user feedback breakdown by geographic.

- **Total Attempt Calls** – Total attempt calls in that time range, including both success and failed calls
- **Total Connected Calls** - Total connected calls in that time range
- **Total Minutes** – Total minute usage in that time range
- **Daily Active Users(DAU)** – Count of daily active user who made at least one connected call in that day
- **Concurrent Calls** – Max of simultaneous active calls in a minute
- **User Feedback** – "Rate My Call" score comes from the user. 3-5 is considered as a good call. 1-2 is considered as a bad call.



For example:

1. If you see average call duration drops to 0 at 02/14/2020, you can first check if the call volume looks normal and see if there is a big discrepancy between total connect calls and total attempt calls. Then go to Network

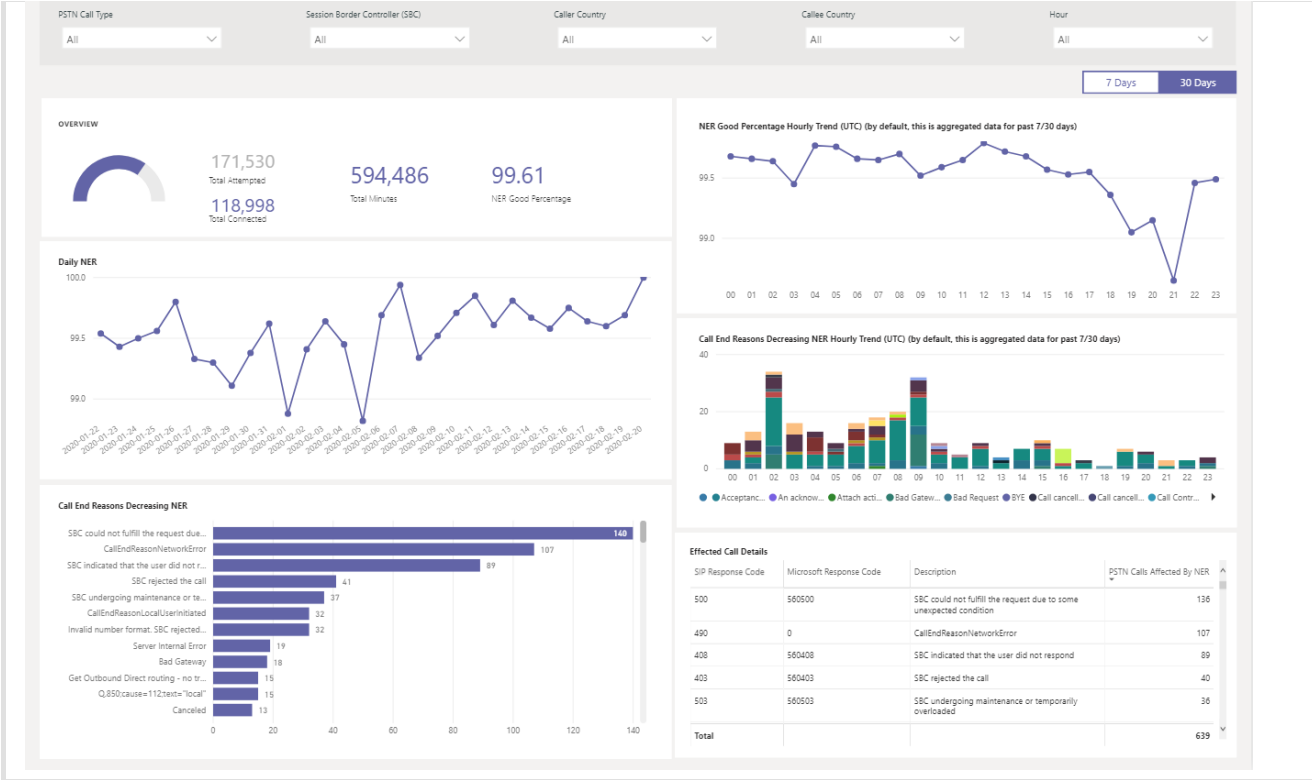
Effectiveness Ratio page to invest on call failure reasons.

2. If you see increasing red spots on the user feedback map, you could go to Network Effectiveness Ratio page and Network Parameter to see if there are any anomalies and you could raise a ticket using MS Service Desk.

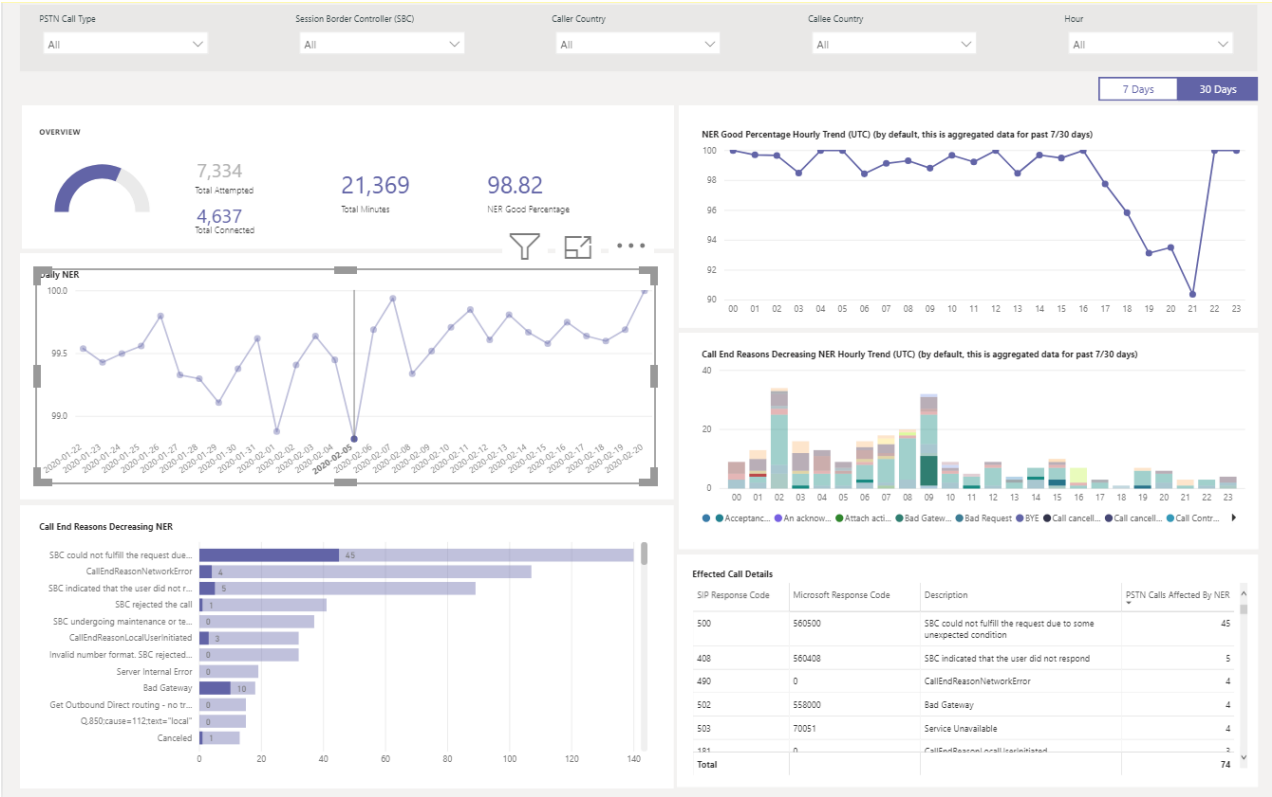
Network Effectiveness Ratio

This is the same metric that appears on the Overall Health dashboard. You can check hourly NER number with affected calls detail for both call directions (inbound/outbound) on the Hourly network effectiveness ratio and call ending reason chart below.

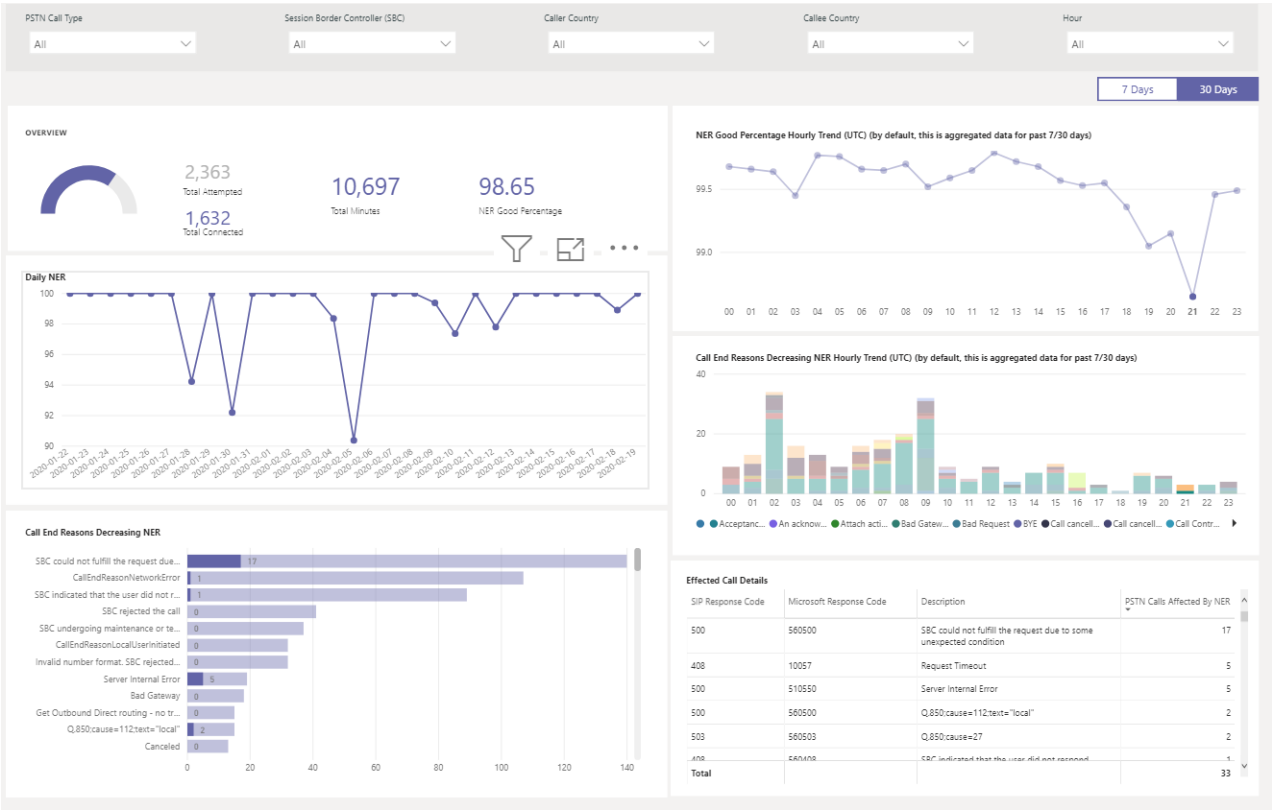
- **NER** - The ability (%) of a network to deliver calls by measuring the number of calls sent versus the number of calls delivered to a recipient.
- **SIP response code**- A three-digit integer response code shows the call status.
- **Microsoft response code**-A response code sent out from Microsoft component.
- **Description** – The reason phase that corresponding to the SIP response code and Microsoft response code.
- **Number of calls affected** – The total number of calls got affected during the selected time range.



For example:



If Daily NER has a dip on 02/05/2020, you can click on the date and other charts will zoom to that specific date.



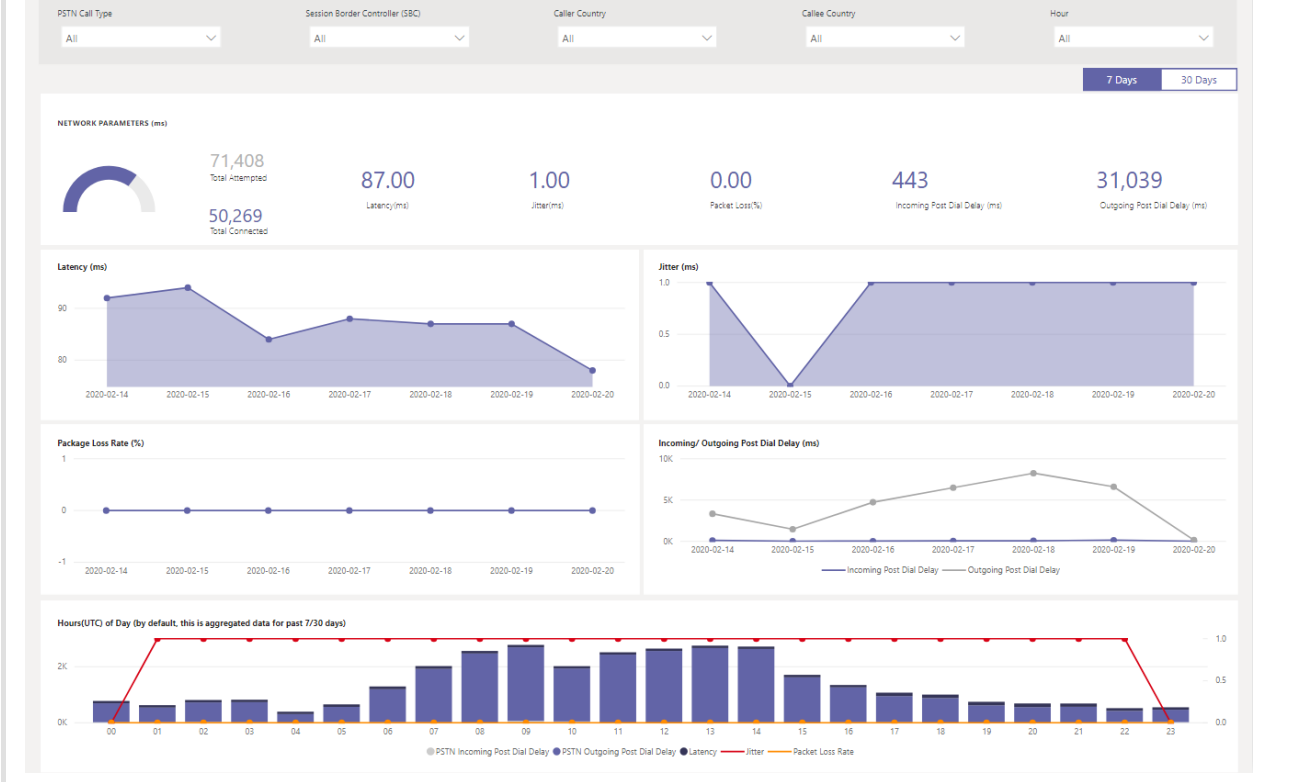
From the NER Good Percentage Hourly Trend, you can find the dip happens around 21:00. Then click again to zoom to hour 21 and check Effected Call Details to see how many calls failed in that hour and what are the call end reasons. You can start with self-trouble shooting on any SBC problems or report to Service Desk if the problem is not related to SBC.

Network Parameters

All network parameters are measured from the Direct Routing interface to the Session Border Controller. For information about the recommended values, see Prepare your organization's network for Microsoft Teams, and

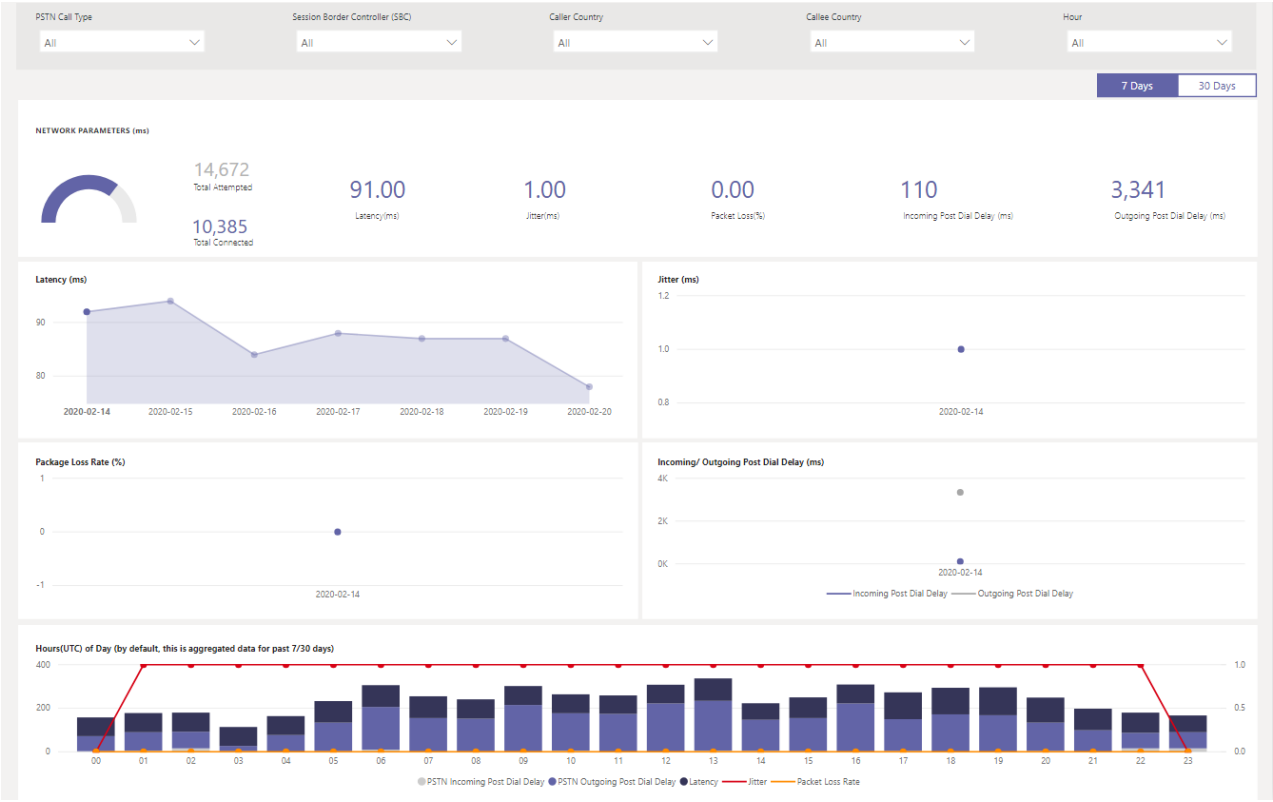
look at the Customer Edge to Microsoft Edge recommended values.

- **Jitter** – Is the millisecond measure of variation in network propagation delay time computed between two endpoints using RTCP (The RTP Control Protocol).
- **Packet Loss** – Is a measure of packet that failed to arrive; it is computed between two endpoints.
- **Latency** - (Also known as round trip time) is the length of time it takes for a signal to be sent plus the length of time it takes for the acknowledgment of that signal to be received. This time delay consists of the propagation times between the two points of a signal.



For example:

If you see a spike on any of the four charts (Latency, Jitter, Package Loss Rate, Post Dial Delay) for a specific date, for example, Latency on 02/14/2020, click on the date point. And the hourly trend chart at the bottom will refresh to show the hourly number. You can check the SBCs or raise a ticket with MS Service Desk.



Related topics

Use Power BI to analyze CQD data for Microsoft Teams

Teams Troubleshooting

Set up call analytics for Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

As a Microsoft Teams admin, you can use per-user call analytics to troubleshoot Teams call quality and connection problems for **individual users**. To take full advantage of call analytics, set up the following:

- Assign specialized support roles to people, such as helpdesk agents, to let them view call analytics for users. These support roles can't access the rest of the Teams admin center.
- Add building, site, and tenant information to per-user call analytics by uploading a .tsv or .csv data file.

When you're ready to start using per-user call analytics, read Use per-user call analytics to troubleshoot poor call quality.

Give permission to support and helpdesk staff

As the Teams admin, you have full access to call analytics information for all users. We've created some specialized Azure Active Directory roles that you can assign to support staff and helpdesk agents so they can also access per-user call analytics (without having access to the rest of the Teams admin center). Assign the **Teams communications support specialist** role to users who should have a limited view of per-user call analytics (Tier 1 support). Assign the **Teams communications support engineer** role to users who need full access to per-user call analytics (Tier 2 support). Neither role has access to the rest of the Teams admin center.

To learn what each of these roles does, read What does each Teams Support role do?

For more information about Teams admin roles, see Use Teams admin roles to manage Teams. To learn how to assign admin roles in Azure Active Directory, see View and assign roles in Azure Active Directory.

To learn how to assign administrative roles in Azure Active Directory, see View and assign roles in Azure Active Directory.

Upload a .tsv or .csv file to add building, site, and tenant information

You can add building, site, and tenant information to per-user call analytics by uploading a .csv or .tsv file. With all this information, call analytics can map IP addresses to physical locations. Admins and helpdesk agents can use this information to help spot trends in call problems. For example, why are users in the same building having similar call quality problems?

If you're a Teams or Skype for Business admin, you can use an existing tenant and building data file from the Teams or Skype for Business Call Quality Dashboard (CQD). First, you download the file from CQD, then upload it to call analytics.

- To download an existing data file, go to **Microsoft Teams admin center** > **Call Quality Dashboard** > **Upload now**. In the **My uploads** list, click **Download** next to the file you want.
- To upload the new file, go to **Microsoft Teams admin center** > **Locations**, and then select **Upload location data** or **Replace location data**.

If you're creating the .tsv or .csv file from scratch, see Upload tenant and building data.

Related topics

Use per-user call analytics to troubleshoot poor call quality

Use call analytics to troubleshoot poor call quality

8/6/2020 • 4 minutes to read • Edit Online

This article explains how to use call analytics to troubleshoot poor Microsoft Teams call or meeting quality for individual users if you're a Teams admin or a Teams communications support specialist or engineer.

Call Analytics permissions

This article assumes that you've already set up call analytics. If you haven't, read Set up call analytics for Teams.

Introduction to call analytics

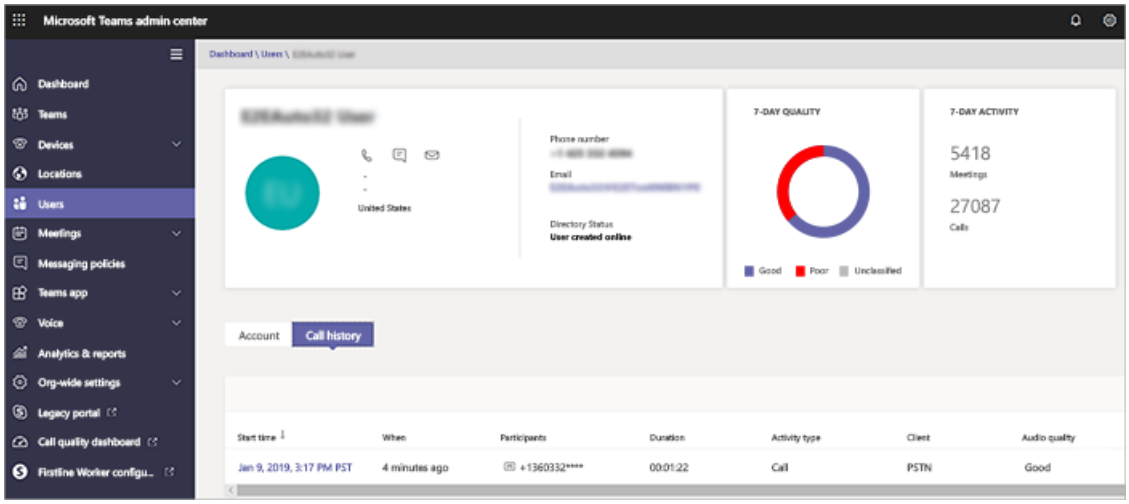
Call analytics shows detailed information about Teams calls and meetings for each user in your Office 365 account. It includes information about devices, networks, connectivity, and call quality (any of these can be a factor in poor call or meeting quality). If you upload building, site, and tenant information, this information will also be shown for each call and meeting. Use call analytics to help you figure out why a user had a poor call or meeting experience.

Call analytics shows you each leg of a call or meeting - for example, from one participant to a second participant. By analyzing these details, a Teams admin can isolate problem areas and identify the root cause for poor quality.

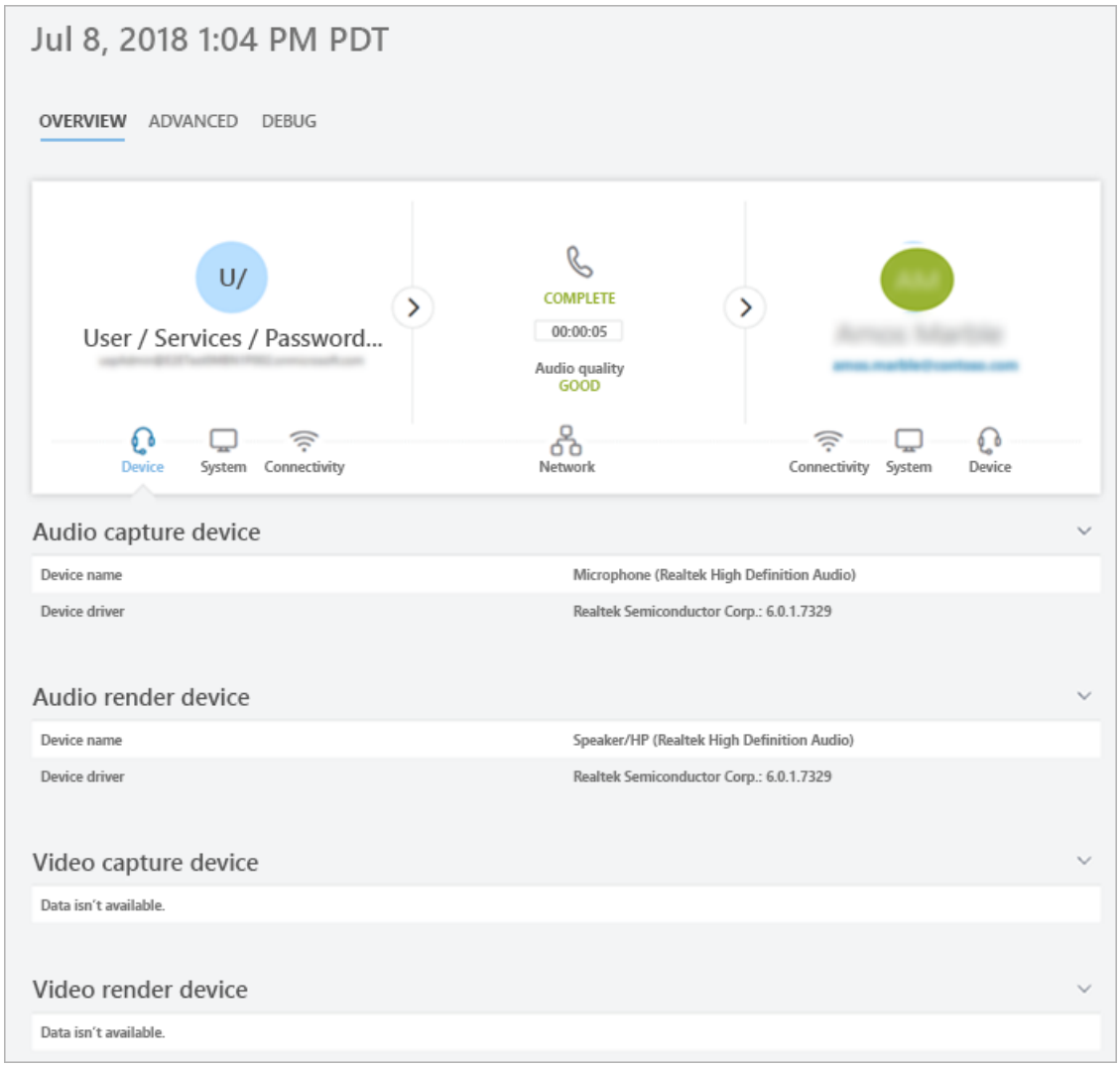
As the Teams admin, you get full access to all call analytics data for each user. In addition, you can assign Azure Active Directory roles to support staff. To learn more about these roles, read Give permission to support and helpdesk staff. Don't miss What does each Teams Support role do? below.

Where to find per-user call analytics

To see all call information and data for a user, go to the Teams admin center. Under **Users**, select a user and then open the **Call History** tab on the user's profile page. Here you'll find all calls and meetings for that user for the last 30 days.



To get additional information about a given session, including detailed media and networking statistics, click a session to see the details.



What does each Teams Support role do?

The **Teams communications support specialist** (Tier 1 support) handles basic call-quality problems. They don't investigate issues with meetings. Instead, they collect related information and then escalate to a communications support engineer.

The **Teams communications support engineer** (Tier 2 support) sees information in detailed call logs that are hidden from the Teams communications support specialist. The table below lists the information available to each Teams communication support role.

The following table tells you what per-user information is available for each communications support role.

ACTIVITY	INFORMATION	WHAT THE COMMUNICATIONS SUPPORT SPECIALIST SEES	WHAT THE COMMUNICATIONS SUPPORT ENGINEER SEES
Calls	Caller name	Only the name of the user for whom the agent searched.	User name.
	Recipient name	Shows as Internal User or External User.	Recipient name.

ACTIVITY	INFORMATION	WHAT THE COMMUNICATIONS SUPPORT SPECIALIST SEES	WHAT THE COMMUNICATIONS SUPPORT ENGINEER SEES
	Caller phone number	Entire phone number except last three digits are obfuscated with asterisk symbols. For example, 15552823***.	Entire phone number except last three digits are obfuscated with asterisk symbols. For example, 15552823***.
	Recipient phone number	Entire phone number except last three digits are obfuscated with asterisk symbols. For example, 15552823***.	Entire phone number except last three digits are obfuscated with asterisk symbols. For example, 15552823***.
	Call Details > **Advanced** tab	Information not shown.	All details shown, such as device names, IP address, subnet mapping, and more.
	Call Details > **Advanced** > **Debug** tab	Information not shown.	All details shown, such as DNS suffix and SSID.
Meetings	Participant names	Only the name of the user for whom the agent searched. Other participants identified as Internal User or External User.	All names shown.
	Participant count	Number of participants.	Number of participants.
	Session details	Session details shown with exceptions. Only the name of the user for whom the agent searched is shown. Other participants identified as Internal User or External User. Last three digits of telephone number obfuscated with asterisk symbols.	Session details shown. User names and session details shown. Last three digits of telephone number obfuscated with asterisk symbols.

Troubleshoot user call quality problems

1. Open the Teams admin center (https://admin.teams.microsoft.com) and sign in with your Teams communications support or Teams admin credentials.
2. On the **Dashboard**, in **User Search**, start typing either the name or SIP address of the user whose calls you want to troubleshoot, or select **View users** to see a list of users.
3. Select the user from the list.
4. Select **Call history**, and then select the call or meeting that you want to troubleshoot.
5. Select the **Advanced** tab, and then look for yellow and red items which indicate poor call quality or connection problems.

In the session details for each call or meeting, minor issues appear in yellow. If something is yellow, it's outside of normal range, and it may be contributing to the problem, but it's unlikely to be the main cause of the problem. If something is red, it's a significant problem, and it's likely the main cause of the poor call quality for this session.

In rare cases, Quality of Experience data isn't received for audio sessions. Often this is caused by the a dropped call or when the connection with the client terminates. When this occurs, the session rating is **unavailable**.

For audio sessions that do have Quality of Experience (QoE) data, the following table describes major issues that qualify a session as **poor**.

ISSUE	AREA	DESCRIPTION
Call setup	Session	The error code Ms-diag 20-29 indicates the call setup failed. The user couldn't join the call or meeting.
Audio network classified poor call	Session	Network quality issues (such as packet loss, jitter, NMOS degradation, RTT, or concealed ratio) were encountered.
Device not functioning	Device	A device isn't functioning correctly. Device not functioning ratios are : DeviceRenderNotFunctioningEventRatio >= 0.005 DeviceCaptureNotFunctioningEventRatio >= 0.005

Related topics

Set up per-user call analytics

Implement Quality of Service (QoS) in Microsoft Teams

11/2/2020 • 11 minutes to read • Edit Online

Quality of Service (QoS) in Microsoft Teams allows real-time network traffic that's sensitive to network delays (for example, voice or video streams) to "cut in line" in front of traffic that's less sensitive (like downloading a new app, where an extra second to download isn't a large deal). QoS uses Windows Group Policy Objects and Port-based Access Control Lists to identify and mark all packets in real-time streams. This helps your network to give voice, video, and screen share streams a dedicated portion of network bandwidth.

If you support a large group of users who are experiencing any of the problems described in this article, then you probably need to implement QoS. A small business with few users might not need QoS, but even there it should be helpful.

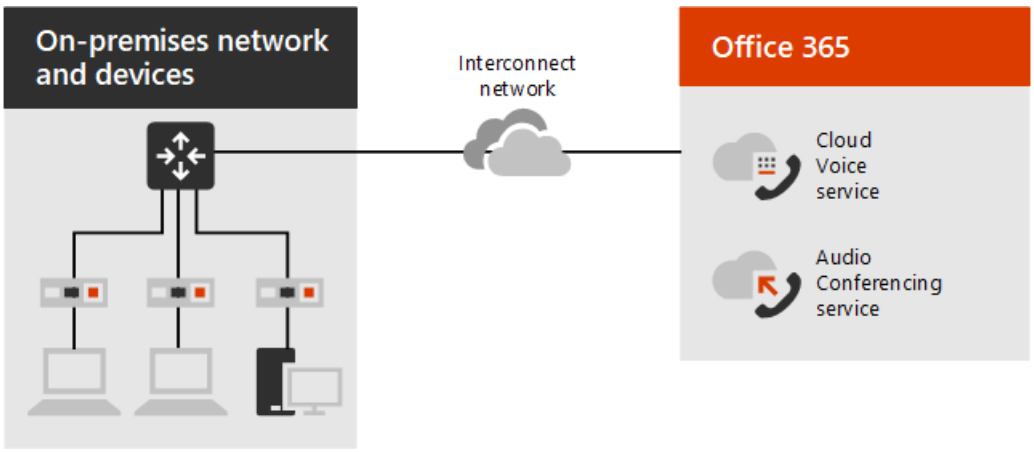
Without some form of QoS, you might see the following quality issues in voice and video:

- Jitter – media packets arriving at different rates, which can result in missing words or syllables in calls
- Packet loss – packets dropped, which can also result in lower voice quality and hard to understand speech
- Delayed round-trip time (RTT) – media packets taking a long time to reach their destinations, which result in noticeable delays between two parties in a conversation and causes people to talk over each other

The least complex way to address these issues is to increase the size of the data connections, both internally and out to the internet. Since that is often cost-prohibitive, QoS provides a way to more effectively manage the resources you have instead of adding bandwidth. To address quality issues, we recommend that you first use QoS, then add bandwidth only where necessary.

For QoS to be effective, you must apply consistent QoS settings throughout your organization. Any part of the path that fails to support your QoS priorities can degrade the quality of calls, video, and screen sharing. This includes applying settings to all user PCs or devices, network switches, routers to the internet, and the Teams service.

Figure 1. The relationship between an organization's networks and Microsoft 365 or Office 365 services



QoS implementation checklist

At a high level, do the following to implement QoS:

1. Make sure your network is ready

2. Select a QoS implementation method
3. Choose initial port ranges for each media type
4. Implement QoS settings:
    a. On clients using a Group Policy Object (GPO) to set client device port ranges and markings
    b. On routers (see the manufacturer documentation) or other network devices. This might include port-based Access Control Lists (ACLs) or simply defining the QoS queues and DSCP markings, or all of these.

        > **IMPORTANT**
        > We recommend implementing these QoS policies using the client source ports and a source and destination IP address of "any." This will catch both incoming and outgoing media traffic on the internal network.

    c. Set how you want to handle media traffic for Teams meetings
5. Validate your QoS implementation by analyzing Teams traffic on the network.

As you prepare to implement QoS, keep the following guidelines in mind:

- The shortest path to Microsoft 365 is best
- Closing ports will only lead to quality degradation
- Any obstacles in between, such as proxies, aren't recommended
- Limit the number of hops:
    - Client to network edge – 3 to 5 hops
    - ISP to Microsoft network edge – 3 hops
    - Microsoft network edge to final destination – irrelevant

For information about configuring firewall ports, go to Office 365 URLs and IP ranges.

Make sure your network is ready

If you're considering a QoS implementation, you should already have determined your bandwidth requirements and other network requirements.

Traffic congestion across a network will greatly impact media quality. A lack of bandwidth leads to performance degradation and a poor user experience. As Teams adoption and usage grows, use reporting, per-user call analytics, and Call Quality Dashboard (CQD) to identify problems and then make adjustments using QoS and selective bandwidth additions.

VPN considerations

QoS only works as expected when implemented on all links between callers. If you use QoS on an internal network and a user signs in from a remote location, you can only prioritize within your internal, managed network. Although remote locations can receive a managed connection by implementing a virtual private network (VPN), a VPN inherently adds packet overhead and creates delays in real-time traffic. We recommend that you avoid running real-time communications traffic over a VPN.

In a global organization with managed links that span continents, we strongly recommend QoS because bandwidth for those links is limited in comparison to the LAN.

Introduction to QoS queues

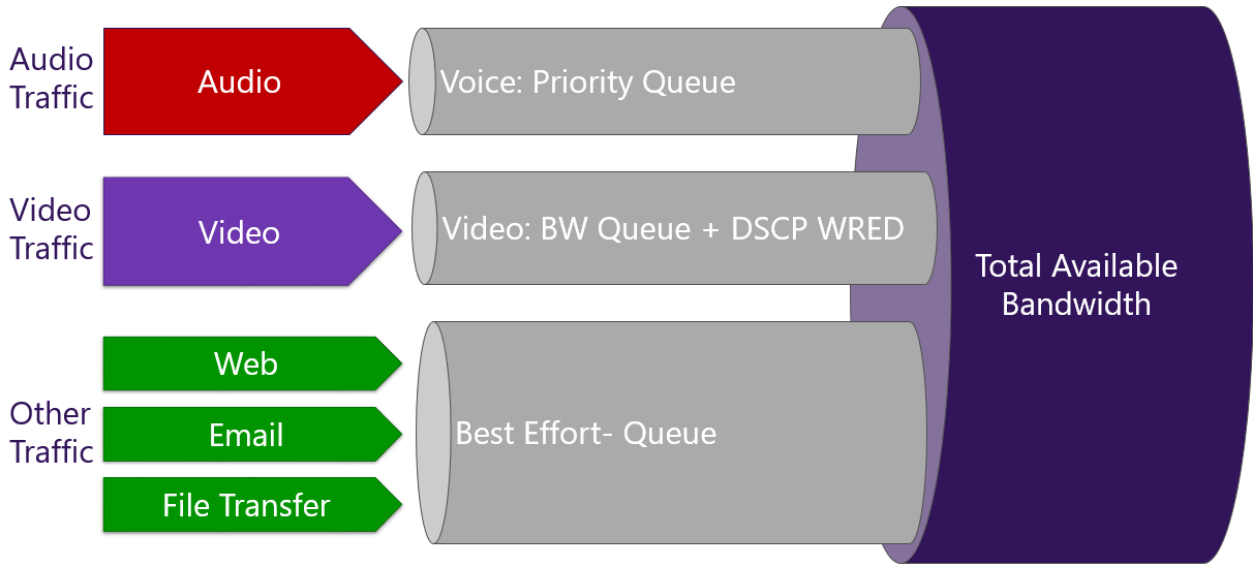
To provide QoS, network devices must have a way to classify traffic and must be able to distinguish voice or video

from other network traffic.

When network traffic enters a router, the traffic is placed into a queue. If a QoS policy isn't configured, there is only one queue, and all data is treated as first-in, first-out with the same priority. That means voice traffic (which is very sensitive to delays) might get stuck behind traffic where a delay of a few extra milliseconds wouldn't be a problem.

When you implement QoS, you define multiple queues using one of several congestion management features, such as Cisco's priority queuing and Class-Based Weighted Fair Queueing (CBWFQ) and congestion avoidance features, such as weighted random early detection (WRED).

Figure 2. Examples of QoS queues



A simple analogy is that QoS creates virtual "carpool lanes" in your data network so some types of data never or rarely encounter a delay. Once you create those lanes, you can adjust their relative size and much more effectively manage the connection bandwidth you have, while still delivering business-grade experiences for your organization's users.

Select a QoS implementation method

You could implement QoS via port-based tagging, using Access Control Lists (ACLs) on your network's routers. Port-based tagging is the most reliable method because it works in mixed Windows, Mac, and Linux environments and is the easiest to implement. Mobile clients don't provide a mechanism to mark traffic by using DSCP values, so they'll require this method.

Using port-based tagging, your network's router examines an incoming packet, and if the packet arrived using a certain port or range of ports, it identifies it as a certain media type and puts it in the queue for that type, adding a predetermined DSCP mark to the IP Packet header so other devices can recognize its traffic type and give it priority in their queue.

Although port-based tagging works across platforms, it only marks traffic at the WAN edge (not all the way to the client machine) and creates management overhead. Refer to the documentation provided by the router manufacturer for instructions on implementing this method.

Insert DSCP markers

You could also implement QoS by using a Group Policy Object (GPO) to direct client devices to insert a DSCP marker in IP packet headers identifying it as particular type of traffic (for example, voice). Routers and other network devices can be configured to recognize this and put the traffic in a separate, higher-priority queue.

Although this scenario is entirely valid, it will only work for domain-joined Windows clients. Any device that isn't a domain-joined Windows client won't be enabled for DSCP tagging. Clients such as Mac OS have hard-coded

tags and will always tag traffic.

On the plus side, controlling the DSCP marking via GPO ensures that all domain-joined computers receive the same settings and that only an administrator can manage them. Clients that can use GPO will be tagged on the originating device, and then configured network devices can recognize the real-time stream by the DSCP code and give it an appropriate priority.

Best practice

We recommend a combination of DSCP markings at the endpoint and port-based ACLs on routers, if possible. Using a GPO to catch the majority of clients, and also using port-based DSCP tagging will ensure that mobile, Mac, and other clients will still get QoS treatment (at least partially).

DSCP markings can be likened to postage stamps that indicate to postal workers how urgent the delivery is and how best to sort it for speedy delivery. Once you've configured your network to give priority to real-time media streams, lost packets and late packets should diminish greatly.

Once all devices in the network are using the same classifications, markings, and priorities, it's possible to reduce or eliminate delays, dropped packets, and jitter by changing the size of the port ranges assigned to the queues used for each traffic type. From the Teams perspective, the most important configuration step is the classification and marking of packets. However, for end-to-end QoS to be successful, you also need to carefully align the application's configuration with the underlying network configuration. Once QoS is fully implemented, ongoing management is a question of adjusting the port ranges assigned to each traffic type based on your organization's needs and actual usage.

Choose initial port ranges for each media type

The DSCP value tells a correspondingly configured network what priority to give a packet or stream, whether the DSCP mark is assigned by clients or the network itself based on ACL settings. Each media workload gets its own unique DSCP value (other services might allow workloads to share a DSCP marking, Teams doesn't) and a defined and separate port range used for each media type. Other environments might have an existing QoS strategy in place, which will help you determine the priority of network workloads.

The relative size of the port ranges for different real-time streaming workloads sets the proportion of the total available bandwidth dedicated to that workload. To return to our earlier postal analogy: a letter with an "Air Mail" stamp might get taken within an hour to the nearest airport, while a small package marked "Bulk Mail" mark can wait for a day before traveling over land on a series of trucks.

Recommended initial port ranges

MEDIA TRAFFIC TYPE	CLIENT SOURCE PORT RANGE	PROTOCOL	DSCP VALUE	DSCP CLASS
Audio	50,000–50,019	TCP/UDP	46	Expedited Forwarding (EF)
Video	50,020–50,039	TCP/UDP	34	Assured Forwarding (AF41)
Application/Screen Sharing	50,040–50,059	TCP/UDP	18	Assured Forwarding (AF21)

Be aware of the following when you use these settings:

- If you plan to implement ExpressRoute in the future and haven't yet implemented QoS, we recommend that you follow the guidance so that DSCP values are the same from sender to receiver.

- All clients, including mobile clients and Teams devices, will use these port ranges and will be affected by any DSCP policy you implement that uses these source port ranges. The only clients that will continue to use dynamic ports are the browser-based clients (clients that let participants join meetings by using their browsers).
- Although the Mac client uses the same port ranges, it also uses hard-coded values for audio (EF) and video (AF41). These values aren't configurable.
- If you later need to adjust the port ranges to improve user experience, the port ranges can't overlap and should be adjacent to each other.

Migrate QoS to Teams

If you've previously deployed Skype for Business Online, including QoS tagging and port ranges, and are now deploying. Teams, Teams will respect the existing configuration and will use the same port ranges and tagging as the Skype for Business client. In most cases, no additional configuration will be needed.

> **NOTE**
> If you're using Application Name QoS tagging via Group Policy, you must add Teams.exe as the application name.

Implement QoS in Teams on Windows using PowerShell

Set QoS for audio

```
new-NetQosPolicy -Name "Teams Audio" -AppPathNameMatchCondition "Teams.exe" -IPProtocolMatchCondition Both -
IPSrcPortStartMatchCondition 50000
-IPSrcPortEndMatchCondition 50019 -DSCPAction 46 -NetworkProfile All
```

Set QoS for video

```
new-NetQosPolicy -Name "Teams Video" -AppPathNameMatchCondition "Teams.exe" -IPProtocolMatchCondition Both -
IPSrcPortStartMatchCondition 50020
-IPSrcPortEndMatchCondition 50039 -DSCPAction 34 -NetworkProfile All
```

Set QoS for sharing

```
new-NetQosPolicy -Name "Teams Sharing" -AppPathNameMatchCondition "Teams.exe" -IPProtocolMatchCondition Both
-IPSrcPortStartMatchCondition 50040
-IPSrcPortEndMatchCondition 50059 -DSCPAction 18 -NetworkProfile All
```

Managing source ports in the Teams admin center

In Teams, QoS source ports used by the different workloads should be actively managed, and adjusted as necessary. Referring to the table in Choose initial port ranges for each media type, the port ranges are adjustable, but the DSCP markings aren't configurable. Once you have implemented these settings, you might find that more or fewer ports are needed for a given media type. Per-user call analytics and Call Quality Dashboard (CQD) should be used in making a decision to adjust port ranges after Teams has been implemented, and periodically as needs change.

> **NOTE**
>
> If you've already configured QoS based on source port ranges and DSCP markings for Skype for Business Online, the same configuration will apply to Teams and no further client or network changes to the mapping will be required, though you may have to set the ranges used in Teams to match what was configured for Skype for Business Online.

If you've previously deployed Skype for Business Server on-premises, you might need to re-examine your QoS policies. Adjust the policies to match port range settings you've verified provide a quality user experience for Teams.

Validate your QoS implementation

For QoS to be effective, the DSCP value set by the GPO needs to be present at both ends of a call. By analyzing the traffic generated by the Teams client, you can verify that the DSCP value isn't changed or stripped out when the Teams workload traffic moves through the network.

Preferably, you capture traffic at the network egress point. You can use port mirroring on a switch or router to help with this.

Implement QoS for other devices

Read these topics for information about implementing QoS for Intune, Surface, iOS, Android, and Mac

- QoS for Surface Hub 2S
- QoS for Surface Hub
- QoS for iOS, Android, and Mac

Related topics

- Video: Network Planning
- Prepare your organization's network for Microsoft Teams
- Implement QoS in the Teams client

Implement Quality of Service (QoS) in Microsoft Teams clients

11/2/2020 • 4 minutes to read • Edit Online

You can use policy-based Quality of Service (QoS) within Group Policy to set the source port range for the predefined DSCP value in the Teams client. The port ranges specified in the following table are a starting point to create a policy for each workload.

Table 1. Recommended initial port ranges

MEDIA TRAFFIC TYPE	CLIENT SOURCE PORT RANGE	PROTOCOL	DSCP VALUE	DSCP CLASS
Audio	50,000–50,019	TCP/UDP	46	Expedited Forwarding (EF)
Video	50,020–50,039	TCP/UDP	34	Assured Forwarding (AF41)
Application/Screen Sharing	50,040–50,059	TCP/UDP	18	Assured Forwarding (AF21)

Wherever possible, configure policy-based QoS settings within a Group Policy object. The following steps are very similar to Configuring port ranges and a Quality of Service policy for your clients on Skype for Business Server, which has some additional details that may not be necessary.

To create a QoS audio policy for domain-joined Windows 10 computers, first log on to a computer on which Group Policy Management has been installed. Open Group Policy Management (click Start, point to Administrative Tools, and then click Group Policy Management), and then complete the following steps:

1. In Group Policy Management, locate the container where the new policy should be created. For example, if all your client computers are located in an OU named **Clients**, the new policy should be created in the Clients OU.
2. Right-click the appropriate container, and then click **Create a GPO in this domain, and Link it here**.
3. In the **New GPO** dialog box, type a name for the new Group Policy object in the **Name** box, and then click **OK**.
4. Right-click the newly created policy, and then click **Edit**.
5. In the Group Policy Management Editor, expand **Computer Configuration**, expand **Windows Settings**, right-click **Policy-based QoS**, and then click **Create new policy**.
6. In the **Policy-based QoS** dialog box, on the opening page, type a name for the new policy in the **Name** box. Select **Specify DSCP Value** and set the value to **46**. Leave **Specify Outbound Throttle Rate** unselected, and then click **Next**.
7. On the next page, select **Only applications with this executable name** and enter the name **Teams.exe**, and then click **Next**. This setting instructs the policy to only prioritize matching traffic from the Teams client.
8. On the third page, make sure that both **Any source IP address** and **Any destination IP address** are

selected, and then click **Next**. These two settings ensure that packets will be managed regardless of which computer (IP address) sent the packets and which computer (IP address) will receive the packets.

9. On page four, select **TCP and UDP** from the **Select the protocol this QoS policy applies to** drop-down list. TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) are the two networking protocols most commonly used.
10. Under the heading **Specify the source port number**, select **From this source port or range**. In the accompanying text box, type the port range reserved for audio transmissions. For example, if you reserved ports 50000 through ports 50019 for audio traffic, enter the port range using this format: **50000:50019**. Click **Finish**.
11. Repeat steps 5-10 to create policies for Video and Application/Desktop Sharing, substituting the appropriate values in steps 6 and 10.

The new policies you've created won't take effect until Group Policy has been refreshed on your client computers. Although Group Policy periodically refreshes on its own, you can force an immediate refresh by following these steps:

1. On each computer for which you want to refresh Group Policy, open a Command Prompt as administrator (*Run as administrator*).
2. At the command prompt, enter

```
gpupdate /force
```

Verify DSCP markings in the Group Policy object

To verify that the values from the Group Policy object have been set, perform the following steps:

1. Open a Command Prompt as administrator (*Run as administrator*).
2. At the command prompt, enter

```
gpresult /R > gp.txt
```

   This will generate a report of applied GPOs and send it to a text file named *gp.txt*.

   For a more readable HTML report named *gp.html*, enter the following command:

```
gpresult /H gp.html
```

3. In the generated file, look for the heading **Applied Group Policy Objects** and verify that the names of the Group Policy objects created earlier are in the list of applied policies.
4. Open the Registry Editor, and go to

   HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows\QoS

   Verify the values for the registry entries listed in Table 2.

   Table 2. Values for Windows registry entries for QoS

NAME	TYPE	DATA
Application Name	REG_SZ	Teams.exe

NAME	TYPE	DATA
DSCP Value	REG_SZ	46
Local IP	REG_SZ	*
Local IP Prefix Length	REG_SZ	*
Local Port	REG_SZ	50000-50019
Protocol	REG_SZ	*
Remote IP	REG_SZ	*
Remote IP Prefix	REG_SZ	*
Remote Port	REG_SZ	*
Throttle Rate	REG_SZ	-1

5. Verify that the value for the Application Name entry is correct for the client you're using, and verify that both the DSCP Value and Local Port entries reflect the settings in the Group Policy object.

Related topics

Implement Quality of Service (QoS) in Teams

Troubleshoot Microsoft Teams installation and update issues on Windows

8/28/2020 • 6 minutes to read • Edit Online

This article provides guidance for how to diagnose and troubleshoot installation and update issues for the Teams desktop client app running on Windows.

Check whether Teams is updated successfully

Follow these steps to check whether a Teams update is successfully installed.

1. In Teams, select your profile picture, and then click **About** > **Version**.
2. On the same menu, click **Check for updates**.
3. Wait for the banner at the top of the app to indicate that a "refresh" of Teams is needed. The link should be shown about a minute later as this process downloads the new version of Teams. The banner also lets you know if you're already running the latest version in which case, no update is necessary.
4. Click the refresh link in the banner.
5. Wait until Teams restarts, and then repeat step 1 to see whether the app is updated.

If you see a failure message or if the version number is the same as in step 4, the update process failed.

Troubleshoot installation and update issues

Troubleshoot installation issues

When Teams is installed, the Teams installer logs the sequence of events to %LocalAppData%\SquirrelTemp\SquirrelSetup.log. The first thing to look for is an error message or a call stack near the end of the log. Note that call stacks at the beginning of the log may not mean that an installation issue exists. It can be easier to compare your log against the log from a successful installation (even on another machine) to see what's expected.

If SquirrelSetup.log doesn't indicate the cause or if you need more information to troubleshoot the issue, see Collect and analyze application and system logs.

Troubleshoot update issues

When Teams is successfully installed, the log location switches from %LocalAppData%\SquirrelTemp to %LocalAppData%\Microsoft\Teams. At this location, there are two log files of interest, SquirrelSetup.log and logs.txt.

- The SquirrelSetup.log file at this location is written by Update.exe, which is an executable that services the Teams app.
- The Logs.txt file is used by the Teams app (specifically Teams.exe) to record significant application events. It will likely contain failure information.

These log files contain personally identifiable information (PII) and so they're not sent to Microsoft.

Teams can automatically start the update process (depending on the policy) or users can manually check for updates by going to their profile picture > **Check for updates**. Both methods use the following sequence of events.

1. **Check for updates**. Teams makes a web request and includes the current app version and deployment ring information. The goal of this step is to get the download link. A failure at this step is logged in Logs.txt.

2. **Download update**. Teams downloads the update by using the download link obtained from step 1. When the download is complete, Teams calls Update.exe to stage the download. A download failure is also logged in Logs.txt.
3. **Stage the update**. The downloaded content is verified and unpacked into an intermediate folder, %LocalAppData%\Microsoft\Teams\stage), which is done by Update.exe. Failures at this step are logged in SquirrelTemp.log.
4. **Install the update**. There are multiple ways to start Teams. The system automatically starts Teams when a user logs in or you can start Teams through a shortcut. In this step, Update.exe checks for the presence of the staging folder, verifies the content again, and performs file operations to un-stage the app. The old application folder in %LocalAppData%\Microsoft\Teams\current is backed up to %LocalAppData%\Microsoft\Teams\previous and the stage folder is renamed to "current". Failures at this step are logged in SquirrelTemp.log.

If SquirrelTemp.log or Logs.txt don't contain sufficient information to determine the underlying cause and you need more information to troubleshoot the issue, go to Collect and analyze application and system logs.

Collect and analyze application and system logs

This section describes how to collect and analyze application and system logs to get more comprehensive information to troubleshoot the issue. You'll use Sysinternals tools to complete these steps. To learn more, see Windows Sysinternals.

Collect logs

1. Download the Sysinternals tools.
2. Extract the zip file to the %TEMP% folder on your local drive.
3. Open an elevated command prompt, and then do the following:
   a. Run the following to go to your TEMP folder:

```
cd /d %TEMP%
```

   b. Copy the setup and application logs. Note that depending on the point of failure, some of these logs may not be present.

```
copy %LocalAppData%\SquirrelTemp\SquirrelSetup.log SquirrelSetup.log
copy %AppData%\Microsoft\Teams\logs.txt logs.txt
copy %LocalAppData%\Microsoft\Teams\SquirrelSetup.log SquirrelSetup_Teams.log
```

   c. Run the following to capture the open handles.

```
handle > handles.txt
```

   d. Run the following to capture the opened DLLs.

```
listdlls -v Teams > dlls.txt
```

   e. Run the following to capture the drivers that are running.

```
driverquery /v > driverquery.txt
```

   f. Run the following to capture the access control lists (ACLs) of the Teams folder.

```
icacls %LOCALAPPDATA%\Microsoft\Teams /save icacls.txt /T
```

Analyze logs (for advanced users)

A failed update can result in unpredictable app behavior. For example, users may be unable to exit Teams, have a stale version of Teams, or can't start Teams. If you experience an issue during an update, the first place to look to find the cause is SquirrelTemp.log. Here are the different types of update failures, listed from most common to least common, and how to analyze and troubleshoot them using logs.

Unable to exit Teams

As Teams determines that it needs to update itself to a newer version, it downloads and stages the new app, and then waits for an opportunity to restart itself the next time the machine is idle. A common issue during this process is when another process or a file system driver locks up the Teams.exe process, which prevents Teams.exe from exiting. As a result, the Teams app can't be replaced by the newly-downloaded and staged app.

Troubleshooting tips:

- To confirm that is the issue that you're experiencing, quit Teams (right-click Teams on the task bar, and then click **Quit**). Then, open Task Manager in Windows to see whether an instance of Teams is still running.
- If you're not on the computer that's having this issue, inspect the SquirrelTemp.log collected from the computer that's experiencing this issue and look for a "Program: Unable to terminate the process in the log" entry.
- To determine what's preventing Teams.exe from exiting, look at the Dlls.txt and Handles.txt logs. These tell you the processes that prevented Teams from exiting.
- Another culprit that can prevent Teams from exiting is the kernel-mode file system filter driver. Use the SysInternals tool, ProcDump, to collect the kernel-mode process dump by running `procdump -mk <pid>`, where is the process ID obtained from Task Manager. You can also inspect the Driverquery.txt log file to see the active filter drivers that may interfere with Teams.
- To recover from this state, restart the computer.

File permissions

Teams creates a number of subfolders and files in the user's profile throughout the installation and update process. Because the app and the updater runs as a non-elevated user, read and write permissions must be granted on the following folders:

FOLDER	USED BY
%LocalAppData%\SquirrelTemp	Teams installer (for example, Teams_Windows_x64.exe) during installation phase
%LocalAppData%\Microsoft\Teams	Teams updater (Update.exe) to extract and stage the app package during update process
%AppData%\Microsoft\Teams	Teams app (Teams.exe) to save settings, app states, and the (pre-staged) downloaded update package

If Teams is denied access because it can't write to a file, another software application may be interfering or a security descriptor entry may be limiting write access to a folder.

Troubleshooting tips:

- Look for "access denied" evidence in SquirrelTemp.log or Logs.txt. Check these files to see whether there was an attempt to write to a file that failed.
- Open Icacls.txt and look for the effective access control entry (ACE) that blocks write operations by a user who is not an admin. Typically, this is in one of the DACL entries. For more information, see the icacls documentation.

File corrupted

In some cases, encryption software can change files in the %LocalAppData%\Microsoft\Teams folder, which can prevent Teams from starting. This can happen at any time, even when the app isn't being updated. Unfortunately, when a file is corrupted, the only way to recover from this state is to uninstall and re-install Teams.

> **NOTE**
>
> If you can't determine the underlying cause of the issue by using any of these steps, you may want to try a Process Monitor session. Process Monitor is a Sysinternals tool that records access to the registry and file system.

Related topics

- Get clients for Teams
- Teams client updates
- Teams Troubleshooting

Troubleshoot connectivity issues with the Microsoft Teams client

8/6/2020 • 2 minutes to read • Edit Online

Most issues discovered with the Microsoft Teams client can be traced back to firewall or proxy connectivity. Verifying that the necessary URLs, IP addresses and ports are opened in your firewall or proxy will minimize unnecessary troubleshooting. For specific information on URLs and IPs required for Microsoft Teams, please see the Microsoft 365 and Office 365 URLs and IP Address support article. The following scenarios require specific URLs and ports to be opened in the firewall.

- Authentication
- Microsoft Teams Client Connectivity
- Collaboration
- Media
- Shared Services
- Third Party Integration
- Skype for Business Interoperability
- Skype for Business Client Interoperability

Related topics

Teams Troubleshooting

Issues receiving messages and calls on legacy systems

7/8/2020 • 2 minutes to read • Edit Online

Users might have issues receiving messages or calls if they are using older versions of Teams or have logged in with other applications.

Legacy ADU setups

If users are signed in to a domain-joined computer and you **don't want their user name pre-populated on the Teams sign-in screen**, admins can set the following Windows registry to turn off pre-population of the user name (UPN):

Computer\HKEY_CURRENT_USER\Software\Microsoft\Office\Teams
SkipUpnPrefill(REG_DWORD)
0x00000001 (1)

> **NOTE**
> Skipping or ignoring user name pre-fill for user names that end in ".local" or ".corp" is on by default, so you don't need to set a registry key to turn these off.

See Sign in to Microsoft Teams using modern authentication for more information.

Skype token revocation

When changing/resetting a password, older clients will not receive messages and calls for up to an hour. To resolve this issue, either restart the app or move to newer clients.

Related topics

Teams Troubleshooting

Use log files in troubleshooting Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

There are three types of log files automatically produced by the client that can be leveraged to assist in troubleshooting Microsoft Teams.

- Debug logs
- Media logs
- Desktop logs

When creating a support request with Microsoft Support, the support engineer will require the debug logs. Having these logs on hand before creating the support request will allow Microsoft to quickly start troubleshooting the problem. Media or desktop logs are only required if requested by Microsoft.

The following table outlines the various clients, and their associated logs. Log files are stored in locations specific to the client and operating system.

CLIENT	DEBUG	DESKTOP	MEDIA
Web	X	-	-
Windows	X	X	X
Mac OSX	X	X	X
Linux	X	X	X
iOS	-	-	-
Android	-	-	-

For a complete list of supported operating systems and browsers, see Get clients for Microsoft Teams.

Debug logs

These are the most common logs and are required for all Microsoft support cases. Debug logs are produced by the Windows and Mac desktop clients, as well as browser based clients. The logs are text based and are read from the bottom up. They can be read using any text based editor and new logs are created when logging into the client.

Debug logs show the following data flows:

- Login
- Connection requests to middle tier services
- Call/conversation

The debug logs are produced using the following OS specific methods:

- Windows:

  Keyboard shortcut: Ctrl + Alt + Shift + 1

- Mac OSX:

  Keyboard shortcut: Option + Command + Shift+1

- Linux:

  Keyboard shortcut: Ctrl + Alt + Shift + 1

The debug logs are automatically downloaded to the following folders.

- Windows: %userprofile%\Downloads
- Mac OSX: ~/Downloads
- Linux: ~/Downloads
- Browser: You will be prompted to save the debug log to default save location

Media logs

Media logs contain diagnostic data about audio, video, and screen sharing in Teams meetings. They are required for support cases that are linked to call-related issues.

Media logging is turned off by default. To log diagnostic data for Teams meetings, users must turn on the option in the Teams client. Go to **Settings** > **General**, select the **Enable logging for meeting diagnostics (requires restarting Teams**) check box, and then restart Teams and reproduce the issue.

The following table outlines the media log locations. When you send the log files to Microsoft support, please verify the timestamp of the log files to make sure the logs cover the time frame when you reproduced the issue.

CLIENT	LOCATION
Windows	%appdata%\Microsoft\Teams\media-stack*.blog
	%appdata%\Microsoft\Teams\skylib*.blog
	%appdata%\Microsoft\Teams\media-stack*.etl
Mac OSX	~/Library/Application Support/Microsoft/Teams/media-stack/*.blog
	~/Library/Application Support/Microsoft/Teams/skylib/*.blog
Linux	~/.config/Microsoft/Microsoft Teams/media-stack/*.blog
	~/.config/Microsoft/Microsoft Teams/skylib/*.blog

Here's a list of the log files that are generated and the information they contain.

LOG FILE NAME	DESCRIPTION
Teams.msrtc-0-s1039525249.blog	Contains information related to the media stack. This includes channel status such as resolution, decoders and encoders used, and the number of frames sent and received, and camera and video-based screen sharing (VBSS) session status.

LOG FILE NAME	DESCRIPTION
rtmcontrol.msrtc-0-2415069487.blog	Records information related to remote control actions, such as the time stamp when control is given, and mouse pointer information.
Teams_MediaStackETW-2-U-xr-U.etl	Records media stack trace events.
Debug-0-s2790420889.blog	Contains information related to the media agent, including rendering quality.
tscalling-0-2061129496.blog	Records events in the ts-calling API.

Desktop logs

Desktop logs, also known as bootstrapper logs, contains log data that occurs between the desktop client and the browser. Like media logs, these logs are only needed if requested by Microsoft. The logs are text based and can be read using any text based editor in a top down format.

Windows:

1. Right-click the **Microsoft Teams** icon in your system tray, select **Get Logs**

Mac OsX:

1. Choosing **Get Logs** from the **Help** pull-down menu

Linux:

1. Click on the **Microsoft Teams** icon in your system tray, select **Get Logs**

CLIENT	LOCATION
Windows	%appdata%\Microsoft\Teams\logs.txt
Mac OSX	~/Library/Application Support/Microsoft/Teams/logs.txt
Linux	~/.config/Microsoft/Microsoft Teams/logs.txt

Related topics

Teams Troubleshooting

FAQ: Support your remote workforce

8/6/2020 • 7 minutes to read • Edit Online

This article answers the most frequently asked questions about how IT admins can manage the increased number of users working remotely. Use this information to support your remote workforce to be productive when they're working from home (WFH).

Check out Support your remote workers with Teams, which will answer many of your questions and help you get ready to support a remote workforce.

Is Microsoft taking proactive action to be ready for the added workload of users working from home to avoid service disruption? All those 1:1 calls will now use Microsoft infrastructure.

Microsoft has been significantly expanding capacity in key regions with the recent announcements regarding the COVID-19 (coronavirus) outbreak. We are monitoring the situation and our services very closely to ensure that our services are available for our customers.One of the benefits of a cloud service is the ability to scale dynamically,including utilization of our significant supply chain, reallocation of resources between services,and redistribution of load.We have seen an increase intheutilization of Microsoft Teams which we have responded to and continue to monitor closely. We are also working to stay ahead of Calling Plans demand, and working to procure enough telephone numbers as needed.

> **NOTE**
>
> If you're already set up with Microsoft 365, and want to know more about the actions Microsoft is taking, please go to the Message Center and review the **MC205458** message center post.

Don't miss our March 5, 2020 blog post from Jared Spataro, Corporate Vice President for Microsoft 365: Our commitment to customers during COVID-19.

With the actions that Microsoft is taking, do we anticipate problems?

Although Microsoft is doing what we can to avoid problems, an unexpected peak in an area due to a spread of the virus may create temporary issues. While we're actively monitoring and adding capacity as needed, you might feel impact until we're able to add capacity in those areas. Also, there are external situations that Microsoft doesn't have control over. We foresee ISPs and telephony carriers are also taking proactive action, but they may or may not have the capacity to handle more load with more people working from home.We are working acrossindustrywith a focus on networking infrastructure. If you have an outage concern, check the Message Center to learn about any current outages.

What can admins do if attendees are having trouble joining meetings by dialing in, such as if calls aren't getting through?

During the duration of the COVID-19 outbreak, we recommend that users join meetings by clicking the **Join Teams Meeting** button rather than dialing in by using the PSTN conference numbers or by using **Call me at**. This is primarily because of congestion in the telephony infrastructures of countries impacted by COVID-19. By avoiding PSTN calls, you'll likely experience better audio quality.

What are the general Microsoft guidelines regarding network optimization for Microsoft 365? Some of my users in China are having a bad experience; what should I do to optimize our network?

Because of unique needs in China, customers may need to take specific actions:

- Office 365 global tenant performance optimization for China users
- General guidelines for any network where Microsoft 365 is being used

- Prepare your organization's network for Teams

My users are reporting bad calls, or their calls are not connecting. What should I do to get help?

We're here to help. Before you contact Support, make sure you've followed all of our networking recommendations. To help you troubleshoot call quality, use Call Analytics and Call Quality Dashboard. We also recommend checking the Service health dashboard in the Microsoft 365 admin center for any current advisories or issues with Microsoft services.

What other actions can I take to have a better experience?

We recommend that users install and use our rich desktop clients instead of web clients (e.g., Outlook, Teams desktop). Desktop clients will cache information and deliver a better performance under bandwidth restrictions or networking problems. From a communications perspective, we strongly recommend using Teams instead of Skype for Business, as Teams has more modern communications protocols and will better handle networking issues. We suggest you experiment with Teams in case of issues - read Get started with your Teams upgrade to learn more.

Is Teams free to help with the COVID-19 (coronavirus) outbreak? How does this work? I don't have Microsoft 365.

Teams is available for free through a couple of different programs:

Individuals

- Sign in with your work or school credentials at https://products.office.com/microsoft-teams. We'll automatically route you to the version of Teams associated with your organization's account, even if you don't have a license.
- If your organization doesn't have a Microsoft cloud account, sign up for the free version of Teams at https://products.office.com/microsoft-teams/free and invite your co-workers to join. To learn more, read Welcome to Teams free. IT admins, read Manage the free version of Teams.

IT professionals

- If you work for a business and want to get employees set up on Teams, you can sign up for Teams Exploratory.
- If you work in Education and want to set up teachers, students, and administrators on Teams, use Office 365 A1, the free version of Office 365 available to educational institutions. Sign up at https://www.microsoft.com/microsoft-365/academic/compare-office-365-education-plans.

I have Microsoft 365 already, but I don't use Teams. Are you providing trial licenses?

If you have Microsoft 365, then you already have Teams. Turn it on for all your users. Once it's turned on, your users can run Teams, either by installing desktop and mobile clients, or from the browser at https://teams.microsoft.com.

How do I get help to get started with Teams and make sure the deployment is successful?

Microsoft offers the FastTrack Center Benefit for Office 365, which will help you to plan, deploy, drive usage, and adopt best practices. This service is offered at no cost when you have at least 150 users. To find out more, read Requesting FastTrack assistance for Microsoft 365 just got easier. FastTrack setup guidance for Microsoft 365 is available to all Office 365 organization administrators. To access this guidance, sign into https://aka.ms/setupguidance with your admin credentials.

If you want to get started on your own, read How to roll out Teams and check out our Teams in 30 webinar series, designed to get you up and running with Teams in as few as 30 days.

For Education (EDU) tenants, Microsoft offers School Data Sync, which helps you to sync information from a school's Student Information System (SIS). For help deploying Microsoft 365, read Microsoft 365 Education deployment overview. Don't miss our new article, Get started with Teams for remote learning.

Where do I find help getting Teams running for my company so my users can work from home during this crisis?

Read Support remote workers using Teams. It covers most of the common tasks and questions on getting started with Teams for remote workers.

I just got started with Microsoft 365 so I can use Teams to support my remote workers or students. I've signed up for the service, but when a user tries to use Teams, they get this error: "You're missing out! Ask your admin to enable Microsoft Teams." What should I do?

After you activate one of the free Teams offers, you'll still need to turn it on for your users. Read Manage user access to Teams and Add users individually or in bulk.

If you're licensing or enabling a user for the first time but you've had Microsoft 365 for a while, you might need to Turn on Teams for your organization. Check I have Microsoft 365 already, but I don't use Teams. Are you providing trial licenses? in this article.

In meetings, attendees are having trouble joining by dialing in - calls aren't getting through.

During periods of high meeting volume (which we've been experiencing in conjunction with the COVID-19 outbreak), we recommend that users join meetings by clicking the **Join Teams Meeting** button rather than dialing in by using the PSTN conference numbers or by using **Call me at**. This helps ensure quality audio during times when high meeting volume is causing congestion on the PSTN network.

Can I use Calling Plans with the Office 365 E1 Trial that Microsoft is offering? Can I assign a telephone number to my users? How much am I going to pay?

Users can make app-to-app audio and video calls in any version of Teams. To assign a number to an employee, you'll need Phone System. We recommend working with your Microsoft partner or sales representative to obtain and deploy this. Learn more at Voice and video calling with Teams.

Can I set up an Auto Attendant with the new Teams E1 Trial so I can have an emergency line internally at my company to deal with COVID-19 (coronavirus)?

To set up a Cloud Auto Attendant in Teams, you'll need Phone System in addition to Teams. We recommend working with your Microsoft partner or sales representative to obtain and deploy this.

Where can I find more information to help remote workers?

End users: Collaborate with Microsoft 365 - how to work better together across all Microsoft 365 workloads

IT admins/ITPro: Support remote workers using Teams.

What is Microsoft doing to support its own employees during the COVID-19 outbreak?

Read our March 5, 2020 blog from Brad Smith, Microsoft President: As we work to protect public health, we also need to protect the income of hourly workers who support our campus.

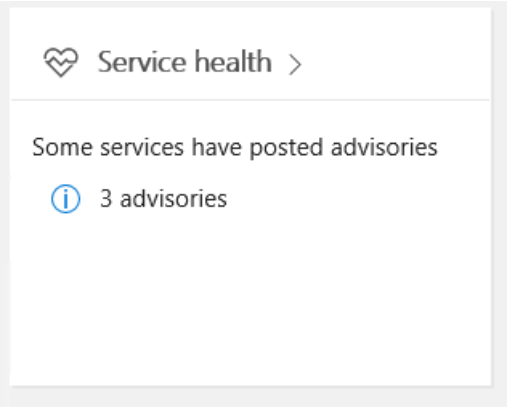
Also be sure to visit Responding to COVID-19 together on Microsoft.com.

Verify service health for Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

Service health for Microsoft Teams is displayed on the Microsoft 365 admin center. Before troubleshooting issues, it's a good practice to verify that the Teams service is healthy. Go to the Teams Service Health console to review the service health.

Also, keep in mind that, Microsoft Teams is built on top of additional Microsoft 365 or Office 365 services, so when looking at Service Health, remember to also check the status of Exchange, SharePoint, and OneDrive for Business. Service Health issues for these other services does not automatically mean that Teams is impacted (e.g. Address Book downloads in Exchange are unavailable), but that you should review the advisories for those affected services to determine if there is an impact to Microsoft Teams.





Related topics

Teams Troubleshooting

Limits and specifications for Microsoft Teams

12/5/2020 • 12 minutes to read • Edit Online

This article describes some of the limits, specifications, and other requirements that apply to Teams.

Teams and channels

FEATURE	MAXIMUM LIMIT	
Number of teams a user can create	Subject to a 250 object limit[1]	
Number of teams a user can be a member of	1,000[2]	
Number of members in a team	10,000[5]	
Number of owners per team	100	
Number of org-wide teams allowed in a tenant	5	
Number of members in an org-wide team	5,000	
Number of teams a global admin can create	500,000	
Number of teams a Microsoft 365 or Office 365 organization can have	500,000[2]	
Number of channels per team	200 (includes deleted channels)[3]	
Number of Private channels per team	30	(includes deleted channels)[3]
Number of members in a Private channel	250	
Maximum number of members in an Office 365 group that can be converted to a team	10,000[5]	
Channel conversation post size	Approximately 28 KB per post[4]	

[1] Any directory object in Azure Active Directory counts towards this limit. Global admins are exempt from this limit, as are apps calling Microsoft Graph using application permissions.

[2] This limit includes archived teams. To go beyond the maximum number of teams a Microsoft 365 or Office 365 organization can have, you must contact Microsoft support.

[3] Deleted channels can be restored within 30 days. During these 30 days, a deleted channel continues to be counted towards the 200 channel or 30 private channel per team limit. After 30 days, a deleted channel and its

content are permanently deleted and the channel no longer counts towards the per team limit.

[4] 28 KB is an approximate limit because it includes the message itself (text, image links, etc.), @-mentions, number of connectors, and reactions.

[5] Teams in GCC can only accommodate 5,000 members and teams in GCCH/DoD can only accommodate 2,500 members.

Messaging

Chat

Users who participate in conversations that are part of the chat list in Teams must have an Exchange Online (cloud-based) mailbox for an admin to search chat conversations. That's because conversations that are part of the chat list are stored in the cloud-based mailboxes of the chat participants. If a chat participant doesn't have an Exchange Online mailbox, the admin won't be able to search or place a hold on chat conversations. For example, in an Exchange hybrid deployment, users with on-premises mailboxes might be able to participate in conversations that are part of the chat list in Teams. However, in this case, content from these conversations isn't searchable and can't be placed on hold because the users don't have cloud-based mailboxes. (For more, see How Exchange and Microsoft Teams interact.)

Teams chat works on a Microsoft Exchange backend, so Exchange messaging limits apply to the chat function within Teams.

FEATURE	MAXIMUM LIMIT
Number of people in a private chat[1]	250
Number of people in a video or audio call from chat	20
Number of file attachments[2]	10
Chat size	Approximately 28 KB per post[3]

[1] If you have more than 20 people in a chat, the following chat features are turned off: Outlook automatic replies and Teams status messages; typing indicator; video and audio calling; sharing; read receipts. The "Set Delivery Options" button (!) is also removed when private group chats contain more than 20 members.

[2] If the number of attachments exceeds this limit, you'll see an error message.

[3] 28 KB is an approximate limit because it includes the message itself (text, image links, etc.), @-mentions, and reactions.

Emailing a channel

If users want to send an email to a channel in Teams, they use the channel email address. When an email is part of a channel, anyone can reply to it to start a conversation. Here are some of the applicable limits for sending email to a channel.

FEATURE	MAXIMUM LIMIT
Message size[1]	24 KB
Number of file attachments[2]	20
Size of each file attachment	Less than 10 MB

FEATURE	MAXIMUM LIMIT
Number of inline images[2]	50

[1] If the message exceeds this limit, a preview message is generated and the user is asked to download and view the original email from the link provided.

[2] If the number of attachments or images exceeds this limit, you'll see an error message.

For more information, see Exchange Online limits.

> **NOTE**
> Message size, file attachments, and inline images limits are the same across all Microsoft 365 and Office 365 licenses. Emailing a channel is not available in Teams for Office GCC/GCCH/DOD organizations.

Channel names

Channel names can't contain the following characters or words:

TYPE	EXAMPLE
Characters	~ # % & * { } + / \ : < > ? | ' " , .
Characters in these ranges	0 to 1F 80 to 9F
Words	forms, CON, CONIN$, CONOUT$, PRN, AUX, NUL, COM1 to COM9, LPT1 to LPT9, desktop.ini, _vti_

Channel names also can't start with an underscore (_) or period (.), or end with a period (.).

Meetings and calls

> **IMPORTANT**
> **Microsoft 365 live event limit increases**
>
> **To help support our customers, through January 1, 2021, we will extend temporary limit increases for Live Events hosted in Teams, Stream, and Yammer, including:**
>
> - Up to 20,000 attendees per event
> - Up to 50 simultaneous events per Teams tenant
> - Up to 16 hours per broadcast
>
> Additionally, Live Events with up to 100,000 attendees can be planned through the Microsoft 365 assistance program. The team will assess each request and work with you to determine options that may be available. Learn more. **After January 1, 2021, customers who need these limit increases will be required to purchase the Advanced Communications add-on.**

FEATURE	MAXIMUM LIMIT
Number of people in a meeting (can chat and call in)	350

FEATURE	MAXIMUM LIMIT
Number of people in a video or audio call from chat	20
Max PowerPoint File Size	2 GB
Teams keeps meeting recordings that don't get uploaded to Microsoft Stream, available for local download	20 days

> **NOTE**
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

Meeting expiration

MEETING TYPE	MEETING EXPIRES AFTER THIS MUCH TIME	EACH TIME YOU START OR UPDATE A MEETING, EXPIRATION EXTENDS BY THIS MUCH TIME
Meet now	Start time + 8 hours	N/A
Regular with no end time	Start time + 60 days	60 days
Regular with end time	End time + 60 days	60 days
Recurring with no end time	Start time + 60 days	60 days
Recurring with end time	End time of last occurrence + 60 days	60 days

> **NOTE**
> Microsoft Teams meetings have a time limit of 24 hours.

Teams Live Events

FEATURE	MAXIMUM LIMIT
Audience size	10,000 attendees
Duration of event	4 hours
Concurrent Live Events running in a Microsoft 365 or Office 365 organization [1]	15

[1] You can schedule as many Live Events as you want, but you can only run 15 at a time. As soon as the producer joins a live event, it's considered to be running. The producer who attempts to join the 16th live event gets an error.

For more information about live events and a comparison of Teams live events to Skype Meeting Broadcast, go to Teams live events and Skype Meeting Broadcast. See also Schedule a Teams live event.

IMPORTANT

Microsoft 365 live event limit increases

To help support our customers, through January 1, 2021, we will extend temporary limit increases for Live Events hosted in Teams, Stream, and Yammer, including:

- Up to 20,000 attendees per event
- Up to 50 simultaneous events per Teams tenant
- Up to 16 hours per broadcast

Additionally, Live Events with up to 100,000 attendees can be planned through the Microsoft 365 assistance program. The team will assess each request and work with you to determine options that may be available. Learn more. **After January 1, 2021, customers who need these limit increases will be required to purchase the Advanced Communications add-on.**

Presence in Outlook

Teams presence in Outlook is supported on the Outlook 2013 desktop app and later. To learn more about presence in Teams, see User presence in Teams.

Storage

Each team in Microsoft Teams has a team site in SharePoint Online, and each channel in a team gets a folder within the default team site document library. Files shared within a conversation are automatically added to the document library, and permissions and file security options set in SharePoint are automatically reflected within Teams.

NOTE

Each private channel has its own SharePoint site collection.

If you don't have SharePoint Online enabled in your tenant, Microsoft Teams users cannot always share files in teams. Users in private chat also cannot share files because OneDrive for Business (which is tied to the SharePoint license) is required for that functionality.

By storing the files in the SharePoint Online document library and OneDrive for Business, all compliance rules configured at the tenant level will be followed. (For more, see How SharePoint Online and OneDrive for Business interact with Microsoft Teams.)

Because Teams runs on a SharePoint Online backend for file sharing, SharePoint limitations apply to the Files section within a Team. Here are the applicable storage limits for SharePoint Online.

FEATURE	MICROSOFT 365 BUSINESS BASIC	MICROSOFT 365 BUSINESS STANDARD	OFFICE 365 ENTERPRISE E1	OFFICE 365 ENTERPRISE E3	OFFICE 365 ENTERPRISE E5	OFFICE 365 ENTERPRISE F1
Storage	1 TB per organization plus 10 GB per license purchased	1 TB per organization plus 10 GB per license purchased	1 TB per organization plus 10 GB per license purchased	1 TB per organization plus 10 GB per license purchased	1 TB per organization plus 10 GB per license purchased	1 TB per organization

FEATURE	MICROSOFT 365 BUSINESS BASIC	MICROSOFT 365 BUSINESS STANDARD	OFFICE 365 ENTERPRISE E1	OFFICE 365 ENTERPRISE E3	OFFICE 365 ENTERPRISE E5	OFFICE 365 ENTERPRISE F1
Storage for Teams Files	Up to 25 TB per site collection or group	Up to 25 TB per site collection or group	Up to 25 TB per site collection or group	Up to 25 TB per site collection or group	Up to 25 TB per site collection or group	Up to 25 TB per site collection or group
File upload limit (per file)	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB

Channels are backed by folders within the SharePoint Online site collection created for the team, so file tabs within Channels share the storage limits of the team they belong to.

For more information, see SharePoint Online limits.

Class teams

Microsoft Teams for Education provides templates designed for unique education scenarios, such as classroom teaching. More information about team types, including class teams, is available in Choose a team type to collaborate in Microsoft Teams.

A class team is a template type with additional apps included, and with limits separate to the number of team members.

> **NOTE**
> Using class teams requires an Office 365 Education license.

Limits for class teams are listed in the following table:

FEATURE	MAXIMUM LIMIT
Number of members in a team	See the Teams and channels section of this article
Number of members to use Assignments in a class team	200
Number of members to use a OneNote Class Notebook in a class team	200

A class team can support more than 200 members. However, if you plan to use either the Assignments app or Class Notebook app within your team, you will need to keep the number of members below the maximum limits above.

Tags

FEATURE	MAXIMUM LIMIT
Number of tags per team	100
Number of suggested default tags per team	25
Number of team members assign to a tag	100

FEATURE	MAXIMUM LIMIT
Number of tags assigned to a user	25

Contacts

Teams uses these contacts:

- Contacts in your organization's Active Directory
- Contacts added to the user's Outlook default folder

Teams users can communicate with anyone in your organization's Active Directory and can add anyone in your organization's Active Directory as a contact and to their contact lists by going to **Chat** > **Contacts** or **Calls** > **Contacts**.

Teams users can also add a person who isn't in your organization's Active Directory as a contact by going to **Calls** > **Contacts**.

Browsers

Teams fully supports the following Internet browsers, with noted exceptions for calling and meetings. This table applies to operating systems running on desktop computers.

BROWSER	CALLING - AUDIO, VIDEO, AND SHARING	MEETINGS - AUDIO, VIDEO, AND SHARING[1] [2] [3]
Internet Explorer 11	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on IE11 without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing) Microsoft 365 apps and services will not support Internet Explorer 11 starting August 17, 2021 (Microsoft Teams will not support Internet Explorer 11 earlier, starting November 30, 2020). Learn more. Please note that Internet Explorer 11 will remain a supported browser. Internet Explorer 11 is a component of the Windows operating system and follows the Lifecycle Policy for the product on which it is installed.
Microsoft Edge, RS2 or later	Fully supported, except no outgoing sharing[4]	Fully supported, except no outgoing sharing
Microsoft Edge (Chromium-based), the latest version plus two previous versions	Fully supported	Fully supported

BROWSER	CALLING - AUDIO, VIDEO, AND SHARING	MEETINGS - AUDIO, VIDEO, AND SHARING
Google Chrome, the latest version plus two previous versions	Fully supported	Fully supported Sharing is supported without any plug-ins or extensions on Chrome version 72 or later.
Safari 13.1+	1:1 calls not supported. Group calls supported with full audio support. Video: Incoming only Sharing: Incoming sharing only (no outgoing)	Meetings are supported with full audio support. Video: Incoming only Sharing: Incoming sharing only (no outgoing). Note that only a user's entire display can be shared; sharing specific windows within a display is not available.
Firefox, the latest version plus two previous versions	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on Firefox without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing)
Safari versions before 13	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on Safari without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing) Safari is enabled on versions higher than 11.1 in preview. While in preview, there are known issues with Safari's Intelligent Tracking Prevention.

[1] To give and take control of shared content during sharing, both parties must be using the Teams desktop client. Control isn't supported when either party is running Teams in a browser. This is due to a technical limitation that we're planning to fix.

[2] Blur my background isn't available when you run Teams in a browser. This feature is only available in the Teams desktop client.

[3] Teams meetings on browsers are limited to a single incoming video feed of active speaker.

[4] Edge RS2 or later doesn't support sending real-time audio and video traffic through HTTP proxies.

NOTE

As long as an operating system can run the supported browser, Teams is supported on desktop computers. For example, running Firefox on the Linux operating system is an option for using Teams.

For mobile operating systems, we recommend that you run the Teams app, available from the Android and iOS stores. Running Teams in a mobile operating system is supported, but many features are unavailable.

Operating systems

For information about operating system requirements, see Get clients for Microsoft Teams.

Prepare your organization's network for Microsoft Teams

12/5/2020 • 8 minutes to read • Edit Online

Network requirements

If you've already optimized your network for Microsoft 365 or Office 365, you're probably ready for Microsoft Teams. In any case - and especially if you're rolling out Teams quickly as your first Microsoft 365 or Office 365 workload to support **remote workers** - check the following before you begin your Teams rollout:

1. Do all your locations have internet access (so they can connect to Microsoft 365 or Office 365)? At a minimum, in addition to normal web traffic, make sure you've opened the following, for all locations, for media in Teams:

Ports	UDP ports **3478** through **3481**
IP addresses	**13.107.64.0/18**, **52.112.0.0/14**, and **52.120.0.0/14**

> **IMPORTANT**
>
> If you need to federate with Skype for Business, either on-premises or online, you will need to configure some additional DNS records.

CNAME RECORDS / HOST NAME	TTL	POINTS TO ADDRESS OR VALUE
sip	3600	sipdir.online.lync.com
lyncdiscover	3600	webdir.online.lync.com

2. Do you have a verified domain for Microsoft 365 or Office 365 (for example, contoso.com)?
   - If your organization hasn't rolled out Microsoft 365 or Office 365, see Get started.
   - If your organization hasn't added or configured a verified domain for Microsoft 365 or Office 365, see the Domains FAQ.
3. Has your organization deployed Exchange Online and SharePoint Online?
   - If your organization doesn't have Exchange Online, see Understand how Exchange and Microsoft Teams interact.
   - If your organization doesn't have SharePoint Online, see Understand how SharePoint Online and OneDrive for Business interact with Microsoft Teams.

Once you've verified that you meet these network requirements, you may be ready to Roll out Teams. If you're a large multinational enterprise, or if you know you've got some network limitations, read on to learn how to assess and optimize your network for Teams.

IMPORTANT

For educational institutions: If your organization is an educational institution and you use a Student Information System (SIS), deploy School Data Sync before you roll out Teams.

Running on-premises Skype for Business Server: If your organization is running on-premises Skype for Business Server (or Lync Server), you must configure Azure AD Connect to synchronize your on-premises directory with Microsoft 365 or Office 365.

Best practice: Monitor your network using CQD and call analytics

Use the Call Quality Dashboard (CQD) to gain insight into the quality of calls and meetings in Teams. CQD can help you optimize your network by keeping a close eye on quality, reliability, and the user experience. CQD looks at aggregate telemetry for an entire organization where overall patterns can become apparent, which lets you identify problems and plan remediation. Additionally, CQD provides rich metrics reports that provide insight into overall quality, reliability, and user experience.

You'll use call analytics to investigate call and meeting problems for an individual user.

Network optimization

The following tasks are optional and aren't required for rolling out Teams, especially if you're a small business and you've already rolled out Microsoft 365 or Office 365. Use this guidance to optimize your network and Teams performance or if you know you've got some network limitations.

You might want to do additional network optimization if:

- Teams runs slowly (maybe you have insufficient bandwidth)
- Calls keep dropping (might be due to firewall or proxy blockers)
- Calls have static and cut out, or voices sound like robots (could be jitter or packet loss)

For an in-depth discussion of network optimization, including guidance for identifying and fixing network impairments, read Microsoft 365 and Office 365 Network Connectivity Principles.

NETWORK OPTIMIZATION TASK	DETAILS
Network planner	For help assessing your network, including bandwidth calculations and network requirements across your org's physical locations, check out the Network Planner tool, in the Teams admin center. When you provide your network details and Teams usage, the Network Planner calculates your network requirements for deploying Teams and cloud voice across your organization's physical locations. For an example scenario, see Using Network Planner - example scenario.
Advisor for Teams	Advisor for Teams is part of the Teams admin center. It assesses your Microsoft 365 or Office 365 environment and identifies the most common configurations that you may need to update or modify before you can successfully roll out Teams.

NETWORK OPTIMIZATION TASK	DETAILS
External Name Resolution	Be sure that all computers running the Teams client can resolve external DNS queries to discover the services provided by Microsoft 365 or Office 365 and that your firewalls are not preventing access. For information about configuring firewall ports, go to Microsoft 365 and Office 365 URLs and IP ranges.
Maintain session persistence	Make sure your firewall doesn't change the mapped Network Address Translation (NAT) addresses or ports for UDP.
Validate NAT pool size	Validate the network address translation (NAT) pool size required for user connectivity. When multiple users and devices access Microsoft 365 or Office 365 using Network Address Translation (NAT) or Port Address Translation (PAT), you need to ensure that the devices hidden behind each publicly routable IP address do not exceed the supported number. Ensure that adequate public IP addresses are assigned to the NAT pools to prevent port exhaustion. Port exhaustion will contribute to internal users and devices being unable to connect to the Microsoft 365 or Office 365 service.
Routing to Microsoft data centers	Implement the most efficient routing to Microsoft data centers. Identify locations that can use local or regional egress points to connect to the Microsoft network as efficiently as possible.
Intrusion Detection and Prevention Guidance	If your environment has an Intrusion Detection or Prevention System (IDS/IPS) deployed for an extra layer of security for outbound connections, be sure to allow all Microsoft 365 or Office 365 URLs.
Configure split-tunnel VPN	We recommend that you provide an alternate path for Teams traffic that bypasses the virtual private network (VPN), commonly known as split-tunnel VPN. Split tunneling means that traffic for Microsoft 365 or Office 365 doesn't go through the VPN but instead goes directly to Microsoft 365 or Office 365. Bypassing your VPN will have a positive impact on Teams quality, and it reduces load from the VPN devices and the organization's network. To implement a split-tunnel VPN, work with your VPN vendor. Other reasons why we recommend bypassing the VPN: • VPNs are typically not designed or configured to support real-time media. • Some VPNs might also not support UDP (which is required for Teams). • VPNs also introduce an extra layer of encryption on top of media traffic that's already encrypted. • Connectivity to Teams might not be efficient due to hair-pinning traffic through a VPN device.

NETWORK OPTIMIZATION TASK	DETAILS
Implement QoS	Use Quality of Service (QoS) to configure packet prioritization. This will improve call quality in Teams and help you monitor and troubleshoot call quality. QoS should be implemented on all segments of a managed network. Even when a network has been adequately provisioned for bandwidth, QoS provides risk mitigation in the event of unanticipated network events. With QoS, voice traffic is prioritized so that these unanticipated events don't negatively affect quality.
Optimize WiFi	Similar to VPN, WiFi networks aren't necessarily designed or configured to support real-time media. Planning for, or optimizing, a WiFi network to support Teams is an important consideration for a high-quality deployment. Consider these factors: • Implement QoS or WiFi Multimedia (WMM) to ensure that media traffic is getting prioritized appropriately over your WiFi networks. • Plan and optimize the WiFi bands and access point placement. The 2.4 GHz range might provide an adequate experience depending on access point placement, but access points are often affected by other consumer devices that operate in that range. The 5 GHz range is better suited to real-time media due to its dense range, but it requires more access points to get sufficient coverage. Endpoints also need to support that range and be configured to leverage those bands accordingly. • If you're using dual-band WiFi networks, consider implementing band steering. *Band steering* is a technique implemented by WiFi vendors to influence dual-band clients to use the 5 GHz range. • When access points of the same channel are too close together, they can cause signal overlap and unintentionally compete, resulting in a bad experience for the user. Ensure that access points that are next to each other are on channels that don't overlap. Each wireless vendor has its own recommendations for deploying its wireless solution. Consult your WiFi vendor for specific guidance.

Bandwidth requirements

Teams is designed to give the best audio, video, and content sharing experience regardless of your network conditions. That said, when bandwidth is insufficient, Teams prioritizes audio quality over video quality.

Where bandwidth *isn't* limited, Teams optimizes media quality, including up to 1080p video resolution, up to 30fps for video and 15fps for content, and high-fidelity audio.

This table describes how Teams uses bandwidth. Teams is always conservative on bandwidth utilization and can deliver HD video quality in under 1.2Mbps. The actual bandwidth consumption in each audio/video call or meeting will vary based on several factors, such as video layout, video resolution, and video frames per

second. When more bandwidth is available, quality and usage will increase to deliver the best experience.

BANDWIDTH(UP/DOWN)	SCENARIOS
30 kbps	Peer-to-peer audio calling
130 kbps	Peer-to-peer audio calling and screen sharing
500 kbps	Peer-to-peer quality video calling 360p at 30fps
1.2 Mbps	Peer-to-peer HD quality video calling with resolution of HD 720p at 30fps
1.5 Mbps	Peer-to-peer HD quality video calling with resolution of HD 1080p at 30fps
500kbps/1Mbps	Group Video calling
1Mbps/2Mbps	HD Group video calling (540p videos on 1080p screen)

Related Topics

Microsoft 365 and Office 365 Network Connectivity Principles

Worldwide endpoints: Skype for Business Online and Teams

Proxy servers for Teams

Media in Teams: Why meetings are simple

Media in Teams: Deep dive into media flows

Identity models and authentication in Teams

How to roll out Teams

Teams Troubleshooting

Use Advisor for Teams to help you roll out Microsoft Teams

12/5/2020 • 10 minutes to read • Edit Online

Advisor for Teams walks you through your Microsoft Teams rollout. It assesses your Microsoft 365 organization environment and identifies the most common configurations that you may need to update or modify before you can successfully roll out Teams. Then, Advisor for Teams creates a Deployment team (in Teams), with channels for each workload you want to roll out. Each workload in the Deployment team comes with a comprehensive Planner plan that includes all the rollout tasks for each workload. Using this Planner plan, you'll assign tasks to the people responsible for each phase of the rollout - including the project manager, Teams service admins, support people, and your adoption and user readiness team. Each rollout task contains all the guidance and resources you need to successfully complete the task.

Advisor for Teams is part of the Teams admin center. At a minimum, you'll need a Microsoft 365 Business Basic license so you can take advantage of the Advisor for Teams integration with Forms and Planner. To begin using Advisor for Teams, click the **Start** button in the **Deploying Teams workload** widget on the Dashboard. Or go to **Planning** > **Teams Advisor**.

> **IMPORTANT**
> Advisor for Teams isn't available for Microsoft 365 Government (GCC High or DoD) deployments.

For a guided overview of the Advisor for Teams experience, check out the Deploy & Configure Microsoft Teams Microsoft Mechanics video.

Using Advisor for Teams

Teams, Forms, and Planner licenses are required to use Advisor for Teams. However, you don't have to be a Teams admin to use Advisor for Teams - anybody in your organization can use it. We've set up special permissions so non-admin users can get to Advisor for Teams, even though it's in the Teams admin center. You DO have to be a Teams admin, Teams Service Administrator, or Global Administrator to open the tenant readiness assessments (this is because the special non-admin roles don't have access to the Microsoft Graph APIs underlying the assessments).

> **IMPORTANT**
> If **Teams Advisor** is missing under **Planning** in the Teams admin center, it means the user isn't licensed for Teams.

The first time you use Advisor for Teams, it'll create a Deployment team for you in Teams. It adds a channel for each workload you select.

> **IMPORTANT**
> If a Deployment team has already been created and a different user tries to create it, they'll get an error telling them to contact their support team. This prevents Teams from unintentionally disclosing information about the existing team and its members. Ask the owner of the Deployment team to add you, or contact your support person for help.

Available Advisor for Teams plans

Advisor for Teams currently provides the following plans:

1. Chat, teams, channels, and apps
   - Tenant assessment
   - Planner plan, including adoption tasks
   - Forms user survey
   - Advisor for Teams bot
2. Meetings and conferencing
   - Tenant assessment
   - Planner plan, including adoption tasks
   - Forms user survey
   - Advisor for Teams bot
3. Skype for Business upgrade
   - Tenant assessment
   - Planner plan, including adoption tasks
   - Forms user survey
   - Advisor for Teams bot
   - Designed for customers who are currently using Skype for Business Online or Skype for Business on-premises environments, the Skype for Business upgrade plan will help you take the guesswork out of your upgrade journey. Leveraging a proven success framework for implementing change, the plan will guide you through the step-by-step process whether you're just getting started with Teams, already using Teams alongside Skype for Business, or ready to upgrade. The plan will also connect you to online guidance and best practices, downloadable assets, live 1:many planning workshops, and additional resources to support your success.

We recommend that you start with the Chat, teams, channels, and apps plan. When you're done deploying that workload, go back to Advisor for Teams and click **Add channel** to start the next workload.

Tenant assessment

Each plan includes a tenant readiness assessment that you can use to quickly identify aspects of your environment that may need remediation before you roll out Teams. The assessments include prerequisites and best practices. Each assessment test will have a green check mark or an orange warning triangle.

- ✓ A green check mark means your tenant passed the specific test.
- ⚠ An orange warning triangle means that we suggest you follow up to determine if any action is needed (for example, a Microsoft 365 Group expiration policy is recommended but not required).

> **IMPORTANT**
> Once a user with an Administrative role starts Advisor for Teams, all assessments run in the background. If you update or remediate something, it may not be reflected in your assessments for up to 24 hours.

The sections below describe each assessment, including whether something is a prerequisite or best practices, what each assessment checks is doing and why, and guidance for remediation as needed.

Assessment tests for all workloads

ASSESSMENT TEST	WHAT IT TELLS YOU
Vanity domain configured	Whether there's a non-@onmicrosoft.com domain configured for your tenant (for example, @contoso.onmicrosoft.com). You can use the @onmicrosoft.com domain, of course, or you can configure a vanity domain - your choice. For more information, read Add a domain to Microsoft 365.
Teams licenses	This is a prerequisite - you **must have** Teams licenses in order to roll out Teams. Queries the Microsoft Graph to see whether you have Teams licenses (with at least one license available to assign). For more information, read Microsoft Teams service description.
Exchange Online licenses	Whether you have an active subscription with available Exchange Online licenses. While Exchange isn't required for basic Teams functionality, integration with Exchange provides an optimal Teams experience. Queries the Microsoft Graph to analyze the subscriptions associated with your tenant and validate whether you have subscriptions with an eligible Exchange Online license (with at least one license available to assign). For more information, read How Exchange and Teams interact.
SharePoint Online licenses	Whether you have an active subscription with available SharePoint Online licenses. We recommend per-user SharePoint Online licenses to provide OneDrive for Business for file storage in chats. Queries the Microsoft Graph to see whether you have SharePoint Online licenses (with at least one license available to assign). For more information, read How SharePoint Online and OneDrive for Business interact with Teams.
Guest access enabled	Whether guest access is turned on. Guest access lets you invite external users to your join your teams. See Collaborate with guests in a team to walk through turning on guest access in Teams; the checklist includes the required Azure AD configurations.
External access configured	Whether external access is turned on. By default, it's turned on, with open federation.

Assessments for chat, teams, channels, and apps

In addition to the Assessment tests for all workloads, the following additional assessments are run for the chat, teams, channels, and apps workload:

ASSESSMENT TEST	WHAT IT TELLS YOU
Microsoft 365 Group naming policy configured	Whether naming standards have been configured for Microsoft 365 Groups. Microsoft 365 Groups naming policy enables your organization to apply a consistent naming strategy to user-created teams and also applies to other Groups workloads (including Outlook, SharePoint, Planner, and Yammer). This test queries Azure AD via the Microsoft Graph to check for the existence of naming policies that apply to Microsoft 365 Groups. For more information, read Groups naming policy.

ASSESSMENT TEST	WHAT IT TELLS YOU
Microsoft 365 Group Expiration Policy configured	Whether a Group Expiration Policy has been defined for Microsoft 365 Groups. This enables your organization to automatically remove inactive Teams. It's turned off by default. This test queries Azure AD via the Microsoft Graph and reports whether the value has been modified from the default. For more information, read Microsoft 365 group expiration policy.

Assessments for meetings and conferencing

In addition to the Assessment tests for all workloads, the following additional assessments are run for the meetings and conferencing workload:

ASSESSMENT TEST	WHAT IT TELLS YOU
Audio Conferencing licenses	Whether you have an active subscription with Audio conferencing licenses. This is a prerequisite if you're deploying Audio conferencing bridges. Queries the Microsoft Graph to see whether you have Audio Conferencing licenses (with at least one license available to assign) For more information, read Teams add-on licensing.
Stream licenses	Whether you have an active subscription with Microsoft Stream licenses. This is a prerequisite if you want to turn on Meeting Recording. Queries the Microsoft Graph to see whether you have Microsoft Stream licenses (with at least one license available to assign). For more information on Stream and how to turn it on, read Teams cloud meeting recording.

Assessments for Skype for Business Upgrade

In addition to the Assessment tests for all workloads, Skype for Business Upgrade also includes assessments used in the meetings and conferencing plan.

Advisor for Teams bot

Once Advisor for Teams creates your Deployment team, the Advisor bot delivers the following message in the General channel:

> **Welcome to your Deployment team for Microsoft Teams!**
>
> The purpose of this team is to walk you through your organization's Teams rollout by giving you all the resources you need and providing a collaboration space for the project team. Each channel created using Advisor for Teams includes a step-by-step Planner plan and other resources such as a Forms users survey that can be used throughout your rollout. At any point, you can you go back and review the tenant readiness assessment or add additional workload plans using the Teams admin center.
>
> **Call to action**
>
> - If you're new to Teams or Planner, check out our Teams walkthrough and watch the Planner quick-start videos.
> - Head over to your Deployment team in Teams. Select your workload channel (for example, Chat, teams, channels, and apps), and select the **Planner** tab to get started.
>
> To learn more about Advisor for Teams, read Use Advisor for Teams to roll out Microsoft Teams.

IMPORTANT

The Advisor for Teams Bot is only used to send a welcome message to your Deployment team. No additional data is collected.

IMPORTANT

The Advisor for Teams bot is turned on by default. Don't turn it off if you use or plan on using Advisor for Teams.

Frequently asked questions

What are the licensing requirements for Advisor for Teams?

At a minimum, you'll need Microsoft 365 Business Basic so you can take advantage of the Advisor for Teams integration with Forms and Planner.

Can I delete the Deployment team?

After Advisor for Teams has created your Deployment team, manage the team like any other team - including the ability to delete it. Be aware that, if you don't delete the team by using the Teams admin center, the Teams admin center will show that the team still exists.

Can I add or remove channels in the Deployment team?

Yes, once the Deployment team has been created, you'll manage the channels the same way as any other team.

Can I add or remove project team members in the Deployment team?

Yes, once the Deployment team has been created, you'll manage it the same way as any other team.

Can I modify the Planner plans?

Yes, after Advisor for Teams has created your Deployment team, you should update the Planner plan so it best supports your Teams rollout. You can modify anything - buckets, tasks, task details - just like any other Planner plan.

Can I modify the Forms survey?

Yes, after Advisor for Teams has created your Deployment team, you can modify the Forms survey as needed.

Are there any differences between Advisor for Teams in GCC?

Yes, user survey Forms are created but are not pinned in plan channels as the Teams Forms app is not available in GCC presently.

What information is Advisor for Teams collecting about my organization?

Advisor for Teams requests your agreement to collecting non-EUII (end user identifying information). The information that is collected is in the form of telemetry that provides feedback to Microsoft on how well Advisor for Teams is driving successful outcomes and where it may need to be improved. This same data is used to identify opportunities for Microsoft to proactively engage with your organization in an effort to assist with your deployment.

Can I use Advisor for Teams with FastTrack?

Yes, FastTrack leverages Advisor for Teams for all customers looking to deploy Teams. They can assist with the initial setup of your Deployment team using Advisor for Teams (if required) and also provide as-needed support on specific topics during your Teams rollout.

Can I use Advisor for Teams with a partner?

Yes, you can use Advisor for Teams while also using a deployment partner for your Teams deployment. If your partner is a CSP and manages your tenant on your behalf, they can use Advisor for Teams to create your

Deployment team and assist you with executing the overall project. Additionally, you can work with any partner by adding those individuals as guests in your Deployment team, to allow them to participate as a member of the overall project team.

How do I use Planner?

Check out Microsoft Planner help and the Planner quick-start videos.

How do I use Forms?

Go to the Forms help center.

Related topics

How to roll out Teams

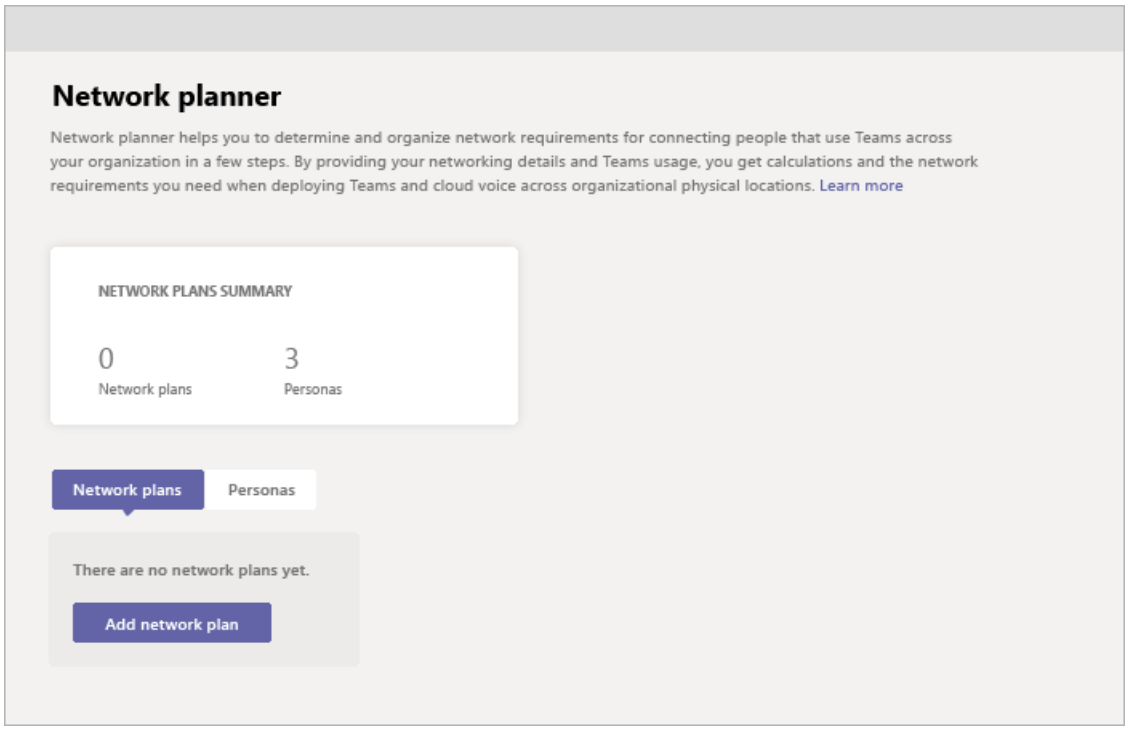
Best practices for organizing teams in Teams

Product names and service plan identifiers for licensing

Use the Network planner for Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

Network Planner is a new tool that is available in the Teams admin center. It can be found by going to **Planner** > **Network planner**. In just a few steps, the Network Planner can help you determine and organize network requirements for connecting Microsoft Teams users across your organization. When you provide your network details and Teams usage, the Network Planner calculates your network requirements for deploying Teams and cloud voice across your organization's physical locations.



Network planner allows you to:

- Create representations of your organization using sites and Microsoft recommended personas (office workers, remote workers, and Teams room system).

  > **NOTE**
  > The recommended personas were developed based on data from Teams best use scenarios and typical usage patterns. However, you can create up to three custom personas in addition to the three recommended personas.

- Generate reports and calculate bandwidth requirements for Teams usage.

To use Network planner, you must be a Global Administrator, Teams Service Administrator, or Teams Communications Administrator.

Create a custom persona

Follow these steps to create a custom persona:

1. Go to the Network planner in the Microsoft Teams admin center.
2. On the **Personas** tab, click **+ Custom persona**.

3. In the **New custom persona** pane, add a name and description for the new persona.
4. Select the permissions that this persona will use within the organization.
5. Click **Save**.

Build your plan

Follow these steps to begin building your network plan:

1. Go to the Network planner in the Microsoft Teams admin center.
2. On the **Network Plan** tab, click **Add a network plan**.
3. Enter a name and description for your network plan. The network plan will appear in the list of available plans.
4. Click the plan name to select the new plan.
5. Add sites to create a representation of your organization's network setup.

   Depending on your organization's network, you may want to use sites to represent a building, an office location, or something else. Sites might be connected by a WAN to allow sharing of internet and/or PSTN connections. For best results, create sites with local connections before you create sites that remotely connect to the internet or PSTN.

   To create a site:

   a. Add a name and description for your site.
   b. Under **Network settings**, add the number of network users at that site (required).
   c. Add network details: WAN-enabled, WAN capacity, internet egress (**Local** or **Remote**), and PSTN egress (none, local, or remote).

   > **NOTE**
   > You must add WAN and internet capacity numbers to see specific bandwidth recommendations when you generate a report.

   d. Click **Save**.

Create a report

After you add all sites, you can create a report, as follows.

1. On the **Reports** tab, click **Start a report**.
2. For each site you create, distribute the number of users across the available personas. If you use the Microsoft recommended personas, the number will be distributed automatically (80% office worker and 20% remote worker).
3. After you complete the distribution, click **Generate report**.

   The generated report will show the bandwidth requirements in several different views so that you can clearly understand the output:

   - A table with individual calculations will display bandwidth requirements for each permitted activity.
   - An additional view will show the overall bandwidth needs with recommendations.

4. Click **Save**. Your report will be available on the reports list for later viewing.

Example scenario

For an example of how to use the Network planner to set up a network plan and generate a report using these steps, download the Network planner How-To PowerPoint deck (English only).

Proxy servers for Teams or Skype for Business Online

6/9/2020 • 2 minutes to read • Edit Online

This article provides guidance about using a proxy server with Teams or Skype for Business.

Not using a proxy server is recommended

When it comes to Teams or Skype for Business traffic over proxies, Microsoft recommends bypassing proxies. Proxies don't make Teams or Skype for Business more secure because the traffic is already encrypted.

And having a proxy can cause issues. Performance-related problems can be introduced to the environment through latency and packet loss. Issues such as these will result in a negative experience in such Teams or Skype for Business scenarios as audio and video, where real-time streams are essential.

If you need to use a proxy server

Some organizations have no option to bypass a proxy for Teams or Skype for Business traffic. If that's the case for you, the problems mentioned above need to be kept in mind.

Microsoft also strongly recommends:

- Using external DNS resolution
- Using direct UDP based routing
- Allowing UDP traffic
- Following the other recommendations in our networking guidelines: Prepare your organization's network for Teams

Following this guidance should minimize potential problems.

Related topics

Microsoft 365 and Office 365 Network Connectivity Principles

Prepare your organization's network for Teams

Plan for Microsoft 365 Groups when creating teams in Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

When considering the use of Microsoft 365 Groups or when creating teams, consider what the team will be used for, who should have access, and what outcome the team will expect to achieve. Pay special attention to the number of channels you create as people can quickly become overrun by content spread too thin (across too many channels).

There are two scenarios that warrant some discussion around planning of Microsoft 365 Groups and their impact on (or by) Microsoft Teams:

- First, since customers could have existing investments in Groups, we currently support both Public and Private groups of less than 5000 members. As mentioned previously, you want to manage the membership of people to a team using the Teams client rather than the Microsoft 365 admin center. Given this scenario, if people are used to threaded conversations in Microsoft 365 Groups, it is worthwhile noting that a Groups conversation is essentially email and not the same as a chat message in a Teams channel. Educate your people about this difference and suggest they adopt the more flexible chat message format in Teams versus emailing the Group using Outlook or OWA.
- Second, for customers who don't have existing Groups defined in Microsoft 365, you can either create them using the Microsoft 365 admin center, the Teams web, or desktop clients. As mentioned previously, manage all future membership to the Microsoft 365 group using the Teams client. Since membership to a team is also defining membership to Microsoft 365 Groups, you should prepare people for this change.

Teams respects Microsoft 365 Groups naming policy (in private preview)

Any Microsoft 365 Groups naming policy that has been set by your admin will be applied in Teams when users create or edit team names. This includes things like mandatory prefixes or suffixes and excluding banned words.

> **NOTE**
> This feature is in private preview, which means that if you're not part of this preview, Teams doesn't yet adhere to this Microsoft 365 Groups naming policy.

To learn more, read Microsoft 365 Groups naming policy in Teams.

The following articles are a good place to find readiness and adoption content for your Microsoft 365 Groups:

- Get more with groups in Outlook
- Add or remove members from Microsoft 365 Groups using the Microsoft 365 admin center
- Restore a deleted group

Plan for lifecycle management in Teams

10/9/2020 • 10 minutes to read • Edit Online

Teams provides a rich set of tools to implement collaboration lifecycle management processes for your organization. This article guides IT pros through the right questions to determine their requirements for lifecycle management, and the tools to use to meet them.

Planning for lifecycle management is important, because it means you're building a plan to get your work done effectively. Most projects consist of a beginning, middle, and end. Teams do too, but they can be constructed and used in such a variety of ways that it's not always obvious which stage of their lifecycle they're in. Having a plan for lifecycle management will help you track your organization's projects as they go through these stages.

> **TIP**
> Watch the following session to learn about more about lifecycle in Microsoft Teams: Governance, management and lifecycle in Microsoft Teams

Lifecycle concepts

The following concepts and definitions all affect the decisions you make for lifecycle management.

Teams

A *team* is a collection of people, content, and tools that facilitate collaboration. A team defines who its members are, and the permissions and policies that apply to those members. Teams are built on Microsoft 365 Groups, and changes to Microsoft 365 group membership sync to the team. Like other Microsoft 365 Groups, Teams come auto-provisioned with an Exchange mailbox, a SharePoint site, a OneNote notebook, and other assets within Microsoft 365 or Office 365. Learn more about Microsoft 365 Groups.

Channels

Channels are the collaboration spaces within a team where the actual work is done. Each channel represents a different topic or workstream within the overall team. For each channel, a folder is automatically created on the SharePoint site to store all files shared to that channel, making it easy for users to find and work on the documents they care about. Channels can also be extended with apps that are relevant to the particular workstream—for example, you can add a Power BI dashboard to a channel to track the success of one aspect of your project.

Team access types

These determine who can join the team:

- *Private* teams are restricted to team members approved by the team owner(s). This is a typical setting for project teams and virtual teams in a large organization.
- *Public* teams are open for anyone in the organization to join directly. This is useful for collaboration on topics of general interest to people in different departments working on different projects. This is a good default setting for smaller organizations.

Team user types and admin roles

Team user types determine how much control a team member has:

- *Team creator* has permissions to create a group or team in the directory. The admin can constrain this user type to a subset of admins or users. For more information, see Manage who can create Microsoft 365 Groups. Team

creators automatically become an owner of the team.

- *Team owner* manages membership and settings for the team. There can be as many as 100 team owners per team.
- *Team member* is a member of your organization who participates in a team.
- *Guest* is a user who's external to your organization. Anyone with an email address can be invited as a guest if your organization has enabled guest access.

> **NOTE**
> You can learn more about team owner and team member capabilities in the article Assign role and permissions in Microsoft Teams.

Teams admin roles determine what capabilities each admin role holder has. These are described in the following table.

ROLE	DESCRIPTION	CAN DO THE FOLLOWING TASKS, USING TOOLS AS NOTED
Teams Service Administrator	Manage the Teams service, and create and manage Microsoft 365 Groups	Manage meetings, including meeting policies, configurations, and conference bridges[1] Manage voice, including calling policies, phone number inventory and assignment, call queues, and auto attendants[1] Manage messaging, including messaging policies[1] Manage all org-wide settings, including federation, Teams upgrade, and Teams client settings[1] Manage the teams in the organization and their associated settings, including membership[2] View the user profile page and troubleshoot user call quality problems by using advanced troubleshooting toolset[3]
Teams Communications Administrator	Manage calling and meetings features within the Microsoft Teams service	Manage meetings, including meeting policies, configurations, and conference bridges[1] Manage voice, including calling policies, phone number inventory and assignment, call queues, and auto attendants[1] View user profile page and troubleshoot user call quality problems using advanced troubleshooting toolset[1]
Teams Communications Specialist	Troubleshoot communications issues within Teams by using basic tools	Access to the user profile page for troubleshooting calls in Call Analytics. Can only view user information for the specific user being searched for.[3]
PowerShell—Skype for Business module or Microsoft Teams admin center		
PowerShell—Microsoft Teams module or Microsoft Teams admin center		
Microsoft Teams admin center only		

ROLE	DESCRIPTION	CAN DO THE FOLLOWING TASKS, USING TOOLS AS NOTED
Teams Communications Support Engineer	Troubleshoot communications issues within Teams by using advanced tools	Access to the user profile page for troubleshooting calls in Call Analytics. Can view the full call record information.[3]

[1] PowerShell—Skype for Business module or Microsoft Teams admin center

[2] PowerShell—Microsoft Teams module or Microsoft Teams admin center

[3] Microsoft Teams admin center only

IT decisions to make before getting started

Before you roll Teams out to your organization, implement any governance policies that your organization has decided it requires. These can include items like naming conventions, expiration policies, retention policies, and more. Generally speaking, it's much easier to implement these requirements prior to scaling your deployment across your organization.

For more information, see Plan for governance in Teams.

Teams lifecycle stages

Generally speaking, a team has a purpose that's aligned with a project or accomplishing a goal. Even if a team was formed based on a shared interest, the team membership will probably change over time and the discussion might grow stale—only to surface again in a slightly different way in a different team.

Each team has a beginning, when the team is created and the channels are set up; a middle, when the team is used and collaboration occurs to match the rhythm of the workflow; and—sometimes—an end, when the team has completed its purpose and reached the end of its useful life.

For more information, see Manage teams in the Microsoft Teams admin center.

Stage 1: Beginning

Create the team

The first step is to define the goal of the team (which can range from business processes to org structure to projects, or simply creating an open, unstructured collaboration hub). Defining the team goal goes hand in hand with identifying the right people. As far as practicable, it's a good idea to foster open collaboration by aiming for broad membership.

Team owners invite team members, set the team picture and description, and can set permissions for individual members.

> **TIP**
>
> It's optimal to identify at least two team owners, to account for absence or reassignment.

Team origins

Teams can originate from a variety of methods, including:

- Create the team from scratch. Add members by using individual email aliases or usernames, or expand a distribution list.
- Create the team from an existing team, and use its channel configuration and any app configuration as a template. You can optionally also use its membership list.

- Add a team to an existing Microsoft 365 group, which also gives the team access to its mailbox and SharePoint site.
- Use the Microsoft Graph Teams APIs or PowerShell cmdlets to create teams. The APIs can programmatically create teams based on Global Address Book attributes (such as region or department) or business processes (client engagements or classroom rosters, for example).

Use these links to get more information about organizing your teams:

- Best practices for organizing teams in Teams
- Deploy chat, teams, channels, & apps
- Deploy meetings & conferencing
- Deploy cloud voice

 Decision points	• What's the purpose of the team? • Who belongs on the team? • Will the team be private or public? • Can new members add themselves or do team owners add them? • Who will have permissions to create channels or add tabs, bots, and connectors?
 Next steps	• Create the team. • Plan for channels.

Set up channels

Any team owner or member with appropriate permissions can create channels in a team. It's important to consider the goal of each channel—options include collaboration around projects, discussions of topics, or areas of common interest. By default, every team includes a General channel; most teams need more than this, and members will create additional channels. It's likely that the set of channels will grow organically as new topics or projects arise, and discussions might outgrow the channel they began in.

To spark interest, the channel owner can post a welcome message, upload relevant documents to the **Files** tab, or add tabs or connectors to the channel. The owner also sets the channel description, and can "auto-favorite" important channels so they're listed by default for all team members.

Consider channel names before creating them as renaming a channel in the team will not rename the corresponding folder in the SharePoint document library which can lead to end-user confusion.

 Decision points	• What initial channels will be added to the team? • What guidance, if any, will be provided for adding new channels? (Will they be set up by project, by topic, or ...?)
 Next steps	• Create initial channels. • Post a welcome message. • Start collaborating.

Stage 2: Middle

As the teamwork begins, the team membership probably begins to evolve, along with the channel hierarchy. Unless the team needs to be strictly controlled and locked down, it's a good idea to encourage exploration even if it

leads to dead ends. As users get more comfortable, they can experiment with @team mentions, marking channels as favorite, and using the General channel to get comfortable with posting. Each team is different; let usage guide the evolution of the design. Monitor the usage and health of the team via Teams reporting capabilities.

Trust, tolerance, and a spirit of collaboration grow organically as key group communications are initiated and sustained in Teams. Team members see the usefulness of group conversations over one-on-one chats. Individual teams tend to develop their own personality, aided by fun features like Giphys and stickers. At the same time, it's important that rogue or rude behavior be discouraged any time it occurs.

Because teams are living organisms, they occasionally need to be checked on and cared for. These are some best practices:

- Use champions to sustain usage if it starts to drop, and also to discover and propagate creative new behaviors.
- Manage guests judiciously, making sure their access ends when the business need ends.
- Encourage members to use threaded conversations with subject lines to improve visibility and attention with scrolling through a channel.
- Let channels evolve with business needs, adding new ones as necessary and allowing old ones to fade (or consider archiving or deleting them if they contain sensitive or ephemeral data, based on your retention requirements).
- Carve out new teams as larger groups or interest-based areas emerge.
- Try different channel collaborations, such as channel meetings or tab conversations around documents.
- Use the Microsoft Teams mobile app to increase engagement.

 Decision points	• Who will monitor usage to identify problems? • What metrics will be used to determine whether a team is healthy? • Identify any teams that have reached the end of their useful life. • Identify unhealthy teams that still serve a purpose but need revitalizing.
 Next step	• Implement a process to monitor individual team health.

Stage 3: End

When the work of a team has run its course, it's important to formally acknowledge that it's over. This gives team members a sense of closure and also prevents anyone from accessing outdated, stale information. You can use the team itself to conduct closure rituals like postmortems and executive summaries.

You can delete teams that you know you don't need (for example, a team created purely for testing or a team that contains sensitive data). Teams are actually deleted with a "soft delete" that IT can reverse for up to 21 days (30 days for Microsoft 365 Groups). Deleting teams doesn't affect any chats or content that were retained in accordance with compliance policies. Channels also have a "soft delete" and can be reversed for up to 21 days after deletion. Deleting a channel will not delete the folder or its contents from the SharePoint document library.

You can also use expiration and retention policies in addition to archiving capabilities to reduce exposure from teams that aren't active any longer or whose owners have left the organization.

Retention policies applied to Teams or associated services such as SharePoint may prohibit the deletion of teams. Additionally, consider that content in a team is often more than just files in the SharePoint document library; it is conversations, Planner boards, wikis, Forms results, recorded meetings, OneNote notebooks, and various others.

For information about setting up expiration and retention policies, see Overview of security and compliance in

Microsoft Teams.

 Decision points	• Define what the end of a team's life looks like. • Decide whether to keep the content of a team available, and for how long.
 Next steps	• Document best practices and lessons learned. • Archive data, if necessary.

Related topics

Governance quick start for Teams

Plan for governance in Teams

10/9/2020 • 7 minutes to read • Edit Online

Teams provides a rich set of tools to implement any governance capabilities your organization might require. This article guides IT pros to ask the right questions to determine their requirements for governance, and how to meet them.

TIP

Watch the following session to learn about more about Governance in Microsoft Teams: Governance, management and lifecycle in Microsoft Teams

Group and team creation, naming, classification, and guest access

Your organization might require that you implement strict controls on how teams are named and classified, whether guests can be added as team members, and who can create teams. You can configure these areas by using Azure Active Directory (Azure AD) and sensitivity labels.

	Decision points	• Does your organization require a specific naming convention for teams? • Do team creators need the ability to assign organization-specific classifications to teams? • Do you need to restrict the ability to add guests to teams on a per-team basis? • Does your organization require limiting who can create teams?
	Next steps	• Document your organization's requirements for team creation, naming, classification, and guest access. • Plan to implement these requirements as a part of your Teams rollout. • Communicate and publish your policies to inform Teams users of the behavior they can expect.

TIP

Use the following table to capture your organization's requirements.

CAPABILITY	DETAILS	AZURE AD PREMIUM LICENSE REQUIRED	DECISION
Team naming policy	Use Prefix-Suffix–based, Custom Blocked Words.	P1	TBD
Team classification	Assign classifications to teams.	P1	TBD
Team guest access	Allow or prevent guests from being added to teams.	No	TBD
Team creation	Limit team creation to administrators.	No	TBD
Team creation	Limit team creation to security group members.	P1	TBD
Sensitivity labels	Configure privacy and guest sharing	No	TBD

NOTE

To help you plan ahead, learn more about setting these policies and what licenses they require.

NOTE

Limiting group and team creation can slow your users' productivity, because many Microsoft 365 and Office 365 services require that groups be created for the service to function. For additional information, navigate to and expand Why control who creates Microsoft 365 Groups.

Additional information

After you've determined your requirements, you can implement them by using Azure AD controls. For technical guidance on how to implement these settings, see:

- Azure Active Directory cmdlets for configuring group settings
- Enforce a naming policy for Microsoft 365 groups in Azure Active Directory
- Microsoft 365 Groups naming policy
- Use sensitivity labels to protect content in Microsoft Teams, Microsoft 365 groups, and SharePoint sites
- End of lifecycle options for groups, teams, and Yammer

Group and team expiration, retention, and archiving

Your organization might have additional requirements for setting policies for expiration, retention, and archiving teams and teams data (channel messages and channel files). You can configure group expiration policies to automatically manage the lifecycle of the group and retention policies to preserve or delete information as needed, and you can archive teams (set them to read-only mode) to preserve a point-in-time view of a team that's no longer active. Note that teams that are archived continue to have the expiration policy applied and may be deleted unless excluded or renewed.

 Decision points	• Does your organization require specifying an expiration date for teams? • Does your organization require specific data retention policies be applied to teams? • Does your organization expect to require the ability to archive inactive teams to preserve the content in a read-only state?
 Next steps	• Document your organization's requirements for team expiration, data retention, and archiving. • Plan to implement these requirements as part of your Teams rollout. • Communicate and publish your policies to inform Teams users of the behavior they can expect.

TIP

Use the following table to capture your organization's requirements.

CAPABILITY	DETAILS	AZURE AD PREMIUM LICENSE REQUIRED	DECISION
Expiration policy	Manage the lifecycle of Microsoft 365 groups by setting an expiration policy.	P1	TBD
Retention policy	Retain or delete data for a specific time period by setting retention policies for Teams in the Security & compliance center. **Note**: Using this feature requires licensing of Microsoft 365 or Office 365 Enterprise E3 or above.	No	TBD
Archive and restore	Archive a team when it's no longer active but you want to keep it around for reference or to reactivate in the future.	No	TBD

NOTE

Group expiration is an Azure AD Premium feature. For this feature to be available, your tenant must have a subscription to Azure AD Premium and licenses for the administrator who configures the settings and the members of the affected groups.

Additional information

For technical guidance on how to implement these settings, see:

- Set up Microsoft 365 groups expiration.
- Set up Teams retention policies.

- Archive or restore a team.

Group and team membership management

Consistently managing members of project based, or restricted groups are necessary for teams that require rapid onboarding and offboarding or users and guests. Your organization may also need to make sure all current members have the business justification to be in a team. Managing members can be hard because team owners can leave and users don't usually leave groups on their own accord when a project ends or when they change roles. The best way to manage group membership that allows users to get access when needed but ensure the group doesn't have a risk of inappropriate access is through two district processes: entitlement management and access reviews.

Entitlement management allows you to delegate to someone, such as a project manager, to collect all the resources that are needed, including teams memberships, into a single package. They can also define who can make requests: either users in your tenant or from other connected organizations. The project manager will receive access requests in their email and approve or deny requests in the MyAccess portal. Administrators can configure the conditions of access to include an expiry date or period by when the user or guest will be removed from the team unless access is renewed. Administrators can also set up the groups associated with teams to take part in access reviews. For access reviews, the group owners will receive regular reminders to review the members of a team. Access reviews include recommendations, which makes it easier for group owners to go through their regular attestation process.

	Decision points	Does your organization require a consistent process for managing membership of one or more teams? Does your organization require owners, or the members themselves, to justify their continued membership of one or more teams on a regular basis? Does your organization require approval for users and guests to request access to resources including teams, groups, SharePoint sites, and apps?
	Next steps?	Document your organizations requirements for each team or specific teams for membership expiry. Plan how your organization can bundle teams, groups, SharePoint sites, and apps together in access packages. Plan which people, such as the requestor's manager, a project manager, a sponsor for a connected organization or a security officer in your organization will need to approve or deny access requests.

TIP

Use the following table to capture your organization's requirements.

CAPABILITY	DETAILS	AZURE AD PREMIUM LICENSE REQUIRED	DECISION
Access reviews	Setup access reviews to recertify the membership of specific teams at regular interval	P2	TBD
Entitlement management	Setup access package to allow users and guests to request access to teams	P2	TBD

> **NOTE**
> To help you plan ahead, learn more about what licenses they require.

Additional information

For technical guidance on how to implement these settings, see:

- Entitlement management
- Access reviews

Teams feature management

Another important aspect of governance and lifecycle management for Teams is the ability to control what features your users will have access to. You can manage messaging, meeting, and calling features, either at the Microsoft 365 or Office 365 organization level or per-user.

 Decision points	• Does your organization require limiting Teams features for your entire tenant? • Does your organization require limiting Teams features for specific users?
 Next steps	• Document your organization's requirements for limiting Teams features at the tenant and user level. • Plan to implement your specific requirements as part of your Teams rollout. • Communicate and publish your policies to inform Teams users of the behavior they can expect.

Teams feature management focus areas

Teams provides granular capabilities for controlling messaging, meeting, calling, and live event features and more, via policies. Different policies can be applied to all users by default or per user as required by your organization.

For detailed lists of all settings, including technical guidance on how to implement them for your organization, see the following articles:

- Manage Microsoft Teams settings for your organization
- Manage Teams during the transition to the new Microsoft Teams admin center
- Private channels in Microsoft Teams
- Manage meeting policies in Teams

- Manage messaging policies in Teams
- Manage your apps in the Microsoft Teams admin center

Additionally, you can set up moderation for a channel and give moderator capabilities to certain users so that they can control who can create channel posts and respond to them. See Set up and manage channel moderation in Microsoft Teams for more information.

Security and compliance

Teams is built on the advanced security and compliance capabilities of Microsoft 365 and Office 365 and supports auditing and reporting, compliance content search, e-discovery, Legal Hold, and retention policies.

> **IMPORTANT**
>
> If your organization has compliance and security requirements, review the in-depth content provided about this topic in the article Overview of security and compliance in Microsoft Teams.

Related topics

Governance quick start for Teams

Get clients for Microsoft Teams

12/5/2020 • 11 minutes to read • Edit Online

Microsoft Teams has clients available for desktop (Windows, Mac, and Linux), web, and mobile (Android and iOS). These clients all require an active internet connection and do not support an offline mode.

> **NOTE**
> For details about each clients' capabilities on different platforms, see Teams features by platform.

> **NOTE**
> Effective November 29, 2018, you'll no longer be able to use the Microsoft Teams for Windows 10 S (Preview) app, available from the Microsoft Store. Instead, you can now download and install the Teams desktop client on devices running Windows 10 S mode. To download the desktop client, go to https://teams.microsoft.com/downloads. MSI builds of the Teams desktop client are not yet available for devices running Windows 10 S mode.
>
> For more information about Windows 10 S mode, see Introducing Windows 10 in S mode.

Desktop client

> **TIP**
> Watch the following session to learn about the benefits of the Windows Desktop Client, how to plan for it, and how to deploy it: Teams Windows Desktop Client

The Microsoft Teams desktop client is a standalone application and is also available in Microsoft 365 Apps for enterprise. Teams is available for 32-bit and 64-bit versions of Windows (8.1 or later), ARM64 for Windows 10 on ARM, and Windows Server (2012 R2 or later), as well as for macOS and Linux (in `.deb` and `.rpm` formats). On Windows, Teams requires .NET Framework 4.5 or later; the Teams installer will offer to install it for you if you don't have it. On Linux, package managers such as `apt` and `yum` will try to install any requirements for you. However, if they don't then you will need to install any reported requirements before installing Teams on Linux.

The desktop clients provide real-time communications support (audio, video, and content sharing) for team meetings, group calling, and private one-on-one calls.

Desktop clients can be downloaded and installed by end users directly from https://teams.microsoft.com/downloads if they have the appropriate local permissions (admin rights are not required to install the Teams client on a PC but are required on a Mac).

> **NOTE**
> For more details about installing Teams on a Chromebook, please see How to install and run Microsoft Office on a Chromebook.

IT admins can choose their preferred method to distribute the installation files to computers in their organization. Some examples include Microsoft Endpoint Configuration Manager (Windows) or Jamf Pro (macOS). To get the MSI package for Windows distribution, see Install Microsoft Teams using MSI.

> **NOTE**
>
> Distribution of the client via these mechanisms is only for the initial installation of Microsoft Team clients and not for future updates.

Windows

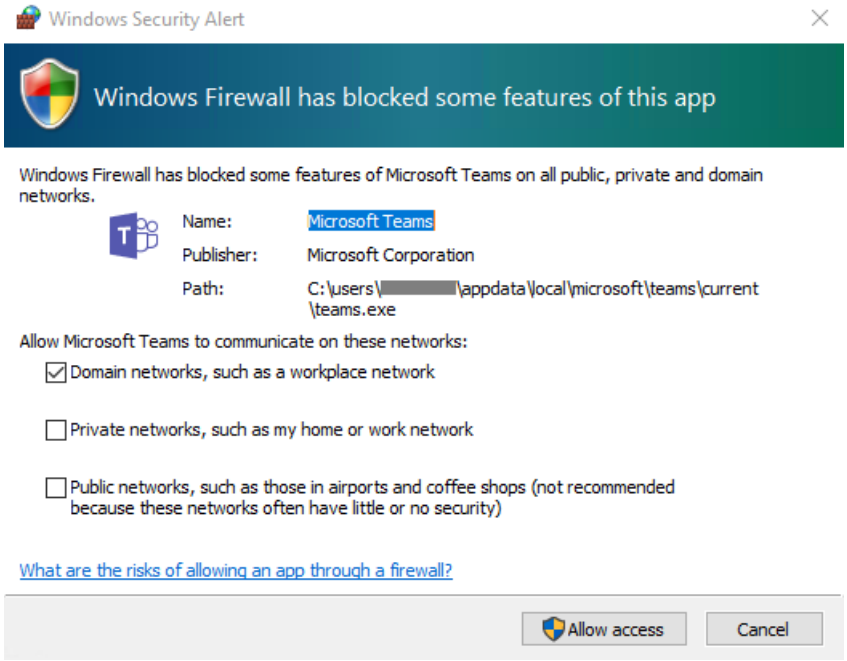
The Microsoft Teams installation for Windows provides downloadable installers in 32-bit and 64-bit architecture.

> **NOTE**
>
> The architecture (32-bit vs. 64-bit) of Microsoft Teams is agnostic to the architecture of Windows and Office that is installed.

The Windows client is deployed to the AppData folder located in the user's profile. Deploying to the user's local profile allows the client to be installed without requiring elevated rights. The Windows client leverages the following locations:

- %LocalAppData%\Microsoft\Teams
- %LocalAppData%\Microsoft\TeamsMeetingAddin
- %AppData%\Microsoft\Teams
- %LocalAppData%\SquirrelTemp

When users initiate a call using the Microsoft Teams client for the first time, they might notice a warning with the Windows firewall settings that asks for users to allow communication. Users might be instructed to ignore this message because the call will work, even when the warning is dismissed.



> **NOTE**
>
> Windows Firewall configuration will be altered even when the prompt is dismissed by selecting "Cancel". Two inbound rules for teams.exe will be created with Allow action for both TCP and UDP protocols.

If you want to prevent Teams from prompting users to create firewall rules when the users make their first call from Teams, use the Sample PowerShell script - inbound firewall rule below.

Mac

Mac users can install Teams by using a PKG installation file for macOS computers. Administrative access is required to install the Mac client. The macOS client is installed to the /Applications folder.

Install Teams by using the PKG file

1. From the Teams download page, under **Mac**, click **Download**.
2. Double click the PKG file.
3. Follow the installation wizard to complete the installation.
4. Teams will be installed to /Applications folder. It is a machine-wide installation.

> **NOTE**
> During the installation, the PKG will prompt for admin credentials. The user needs to enter the admin credentials, regardless of whether or not the user is an admin.

If a user currently has a DMG installation of Teams and wants to replace it with the PKG installation, the user should:

1. Exit the Teams app.
2. Uninstall the Teams app.
3. Install the PKG file.

IT admins can use managed deployment of Teams to distribute the installation files to all Macs in their organization, such as Jamf Pro.

> **NOTE**
> If you experience issues installing the PKG, let us know. In the **Feedback** section at the end of this article, click **Product feedback**.

Linux

Users will be able to install native Linux packages in `.deb` and `.rpm` formats. Installing the DEB or RPM package will automatically install the package repository.

- DEB `https://packages.microsoft.com/repos/ms-teams stable main`
- RPM `https://packages.microsoft.com/yumrepos/ms-teams`

The signing key to enable auto-updating using the system's package manager is installed automatically. However, it can also be found at: (https://packages.microsoft.com/keys/microsoft.asc). Microsoft Teams ships monthly and if the repository was installed correctly, then your system package manager should handle auto-updating in the same way as other packages on the system.

> **NOTE**
> If you find a bug, submit it using `Report a Problem` from within the client. For known issues, see Support Teams in your organization. For Teams for Linux support you can use the Linux forum support channel on Microsoft Q&A. Be sure to use the `teams-linux` tag when posting questions.

Install Teams using DEB package

1. Download the package from https://aka.ms/getteams.

2. Install using one of the following:
   - Open the relevant package management tool and go through the self-guided Linux app installation process.
   - Or if you love Terminal, type: `sudo apt install **teams download file**`

You can launch Teams via Activities or via Terminal by typing `teams`.

Install Teams using RPM package

1. Download the package from https://aka.ms/getteams.
2. Install using one of the following:
   - Open the relevant package management tool and go through the self-guided Linux app installation process.
   - Or if you love Terminal, type: `sudo yum install **teams download file**`

You can launch Teams via Activities or via Terminal by typing `teams`.

Install manually from the command line

Install manually on Debian and Ubuntu distributions:

```
curl https://packages.microsoft.com/keys/microsoft.asc | sudo apt-key add -

sudo sh -c 'echo "deb [arch=amd64] https://packages.microsoft.com/repos/ms-teams stable main" >
/etc/apt/sources.list.d/teams.list'

sudo apt update
sudo apt install teams
```

Install manually on RHEL, Fedora and CentOS based distributions:

```
sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc

sudo sh -c 'echo -e "[teams]\nname=teams\nbaseurl=https://packages.microsoft.com/yumrepos/ms-
teams\nenabled=1\ngpgcheck=1\ngpgkey=https://packages.microsoft.com/keys/microsoft.asc" >
/etc/yum.repos.d/teams.repo'

sudo dnf check-update
sudo dnf install teams
```

Alternatively, to use yum instead of dnf:

```
yum check-update
sudo yum install teams
```

Install manually on openSUSE based distributions:

```
sudo rpm --import https://packages.microsoft.com/keys/microsoft.asc

sudo sh -c 'echo -e "[teams]\nname=teams\nbaseurl=https://packages.microsoft.com/yumrepos/ms-
teams\nenabled=1\nautorefresh=1\nkeeppackages=0\ntype=rpm-
md\ngpgcheck=1\ngpgkey=https://packages.microsoft.com/keys/microsoft.asc" > /etc/zypp/repos.d/teams.repo'

sudo zypper refresh
sudo zypper install teams
```

Web client

The web client (https://teams.microsoft.com) is a full, functional client that can be used from a variety of browsers. The web client supports Calling and Meetings by using webRTC, so there is no plug-in or download required to run Teams in a web browser. The browser must be configured to allow third-party cookies.

Teams fully supports the following Internet browsers, with noted exceptions for calling and meetings. This table applies to operating systems running on desktop computers.

BROWSER	CALLING - AUDIO, VIDEO, AND SHARING	MEETINGS - AUDIO, VIDEO, AND SHARING[1] [2] [3]
Internet Explorer 11	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on IE11 without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing) Microsoft 365 apps and services will not support Internet Explorer 11 starting August 17, 2021 (Microsoft Teams will not support Internet Explorer 11 earlier, starting November 30, 2020). Learn more. Please note that Internet Explorer 11 will remain a supported browser. Internet Explorer 11 is a component of the Windows operating system and follows the Lifecycle Policy for the product on which it is installed.
Microsoft Edge, RS2 or later	Fully supported, except no outgoing sharing[4]	Fully supported, except no outgoing sharing
Microsoft Edge (Chromium-based), the latest version plus two previous versions	Fully supported	Fully supported
Google Chrome, the latest version plus two previous versions	Fully supported	Fully supported Sharing is supported without any plug-ins or extensions on Chrome version 72 or later.
Safari 13.1+	1:1 calls not supported. Group calls supported with full audio support. Video: Incoming only Sharing: Incoming sharing only (no outgoing)	Meetings are supported with full audio support. Video: Incoming only Sharing: Incoming sharing only (no outgoing). Note that only a user's entire display can be shared; sharing specific windows within a display is not available.

BROWSER	CALLING - AUDIO, VIDEO, AND SHARING	MEETINGS - AUDIO, VIDEO, AND SHARING
Firefox, the latest version plus two previous versions	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on Firefox without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing)
Safari versions before 13	Not supported	Meetings are supported only if the meeting includes PSTN coordinates. To attend a meeting on Safari without PSTN coordinates, users must download the Teams desktop client. Video: Not supported Sharing: Incoming sharing only (no outgoing) Safari is enabled on versions higher than 11.1 in preview. While in preview, there are known issues with Safari's Intelligent Tracking Prevention.

[1] To give and take control of shared content during sharing, both parties must be using the Teams desktop client. Control isn't supported when either party is running Teams in a browser. This is due to a technical limitation that we're planning to fix.

[2] Blur my background isn't available when you run Teams in a browser. This feature is only available in the Teams desktop client.

[3] Teams meetings on browsers are limited to a single incoming video feed of active speaker.

[4] Edge RS2 or later doesn't support sending real-time audio and video traffic through HTTP proxies.

> **NOTE**
>
> As long as an operating system can run the supported browser, Teams is supported on desktop computers. For example, running Firefox on the Linux operating system is an option for using Teams.
>
> For mobile operating systems, we recommend that you run the Teams app, available from the Android and iOS stores. Running Teams in a mobile operating system is supported, but many features are unavailable.

The web client performs browser version detection upon connecting to https://teams.microsoft.com. If an unsupported browser version is detected, it will block access to the web interface and recommend that the user download the desktop client or mobile app.

Mobile clients

The Microsoft Teams mobile apps are available for Android and iOS, and are geared for on-the-go users participating in chat-based conversations and allow peer-to-peer audio calls. For mobile apps, go to the relevant mobile stores Google Play and the Apple App Store. The Windows Phone App was retired July 20, 2018 and may no longer work.

In China, here's how to get Teams for Android.

Supported mobile platforms for Microsoft Teams mobile apps are the following:

- **Android**: Support is limited to the last four major versions of Android. When a new major version of Android is released, the new version and the previous three versions are officially supported.
- **iOS**: Support is limited to the two most recent major versions of iOS. When a new major version of iOS is released, the new version of iOS and the previous version are officially supported.

> **NOTE**
> The mobile version must be available to the public in order for Teams to work as expected.

Mobile apps are distributed and updated through the respective mobile platform's app store only. Distribution of the mobile apps via MDM or side-loading is not supported by Microsoft. Once the mobile app has been installed on a supported mobile platform, the Teams Mobile App itself will be supported provided the version is within three months of the current release.

	Decision Point	Are there any restrictions preventing users from installing the appropriate Microsoft Teams client on their devices?
	Next Steps	If your organization restricts software installation, make sure that process is compatible with Microsoft Teams. Note: Admin rights are not required for PC client installation but are required for installation on a Mac.

Client update management

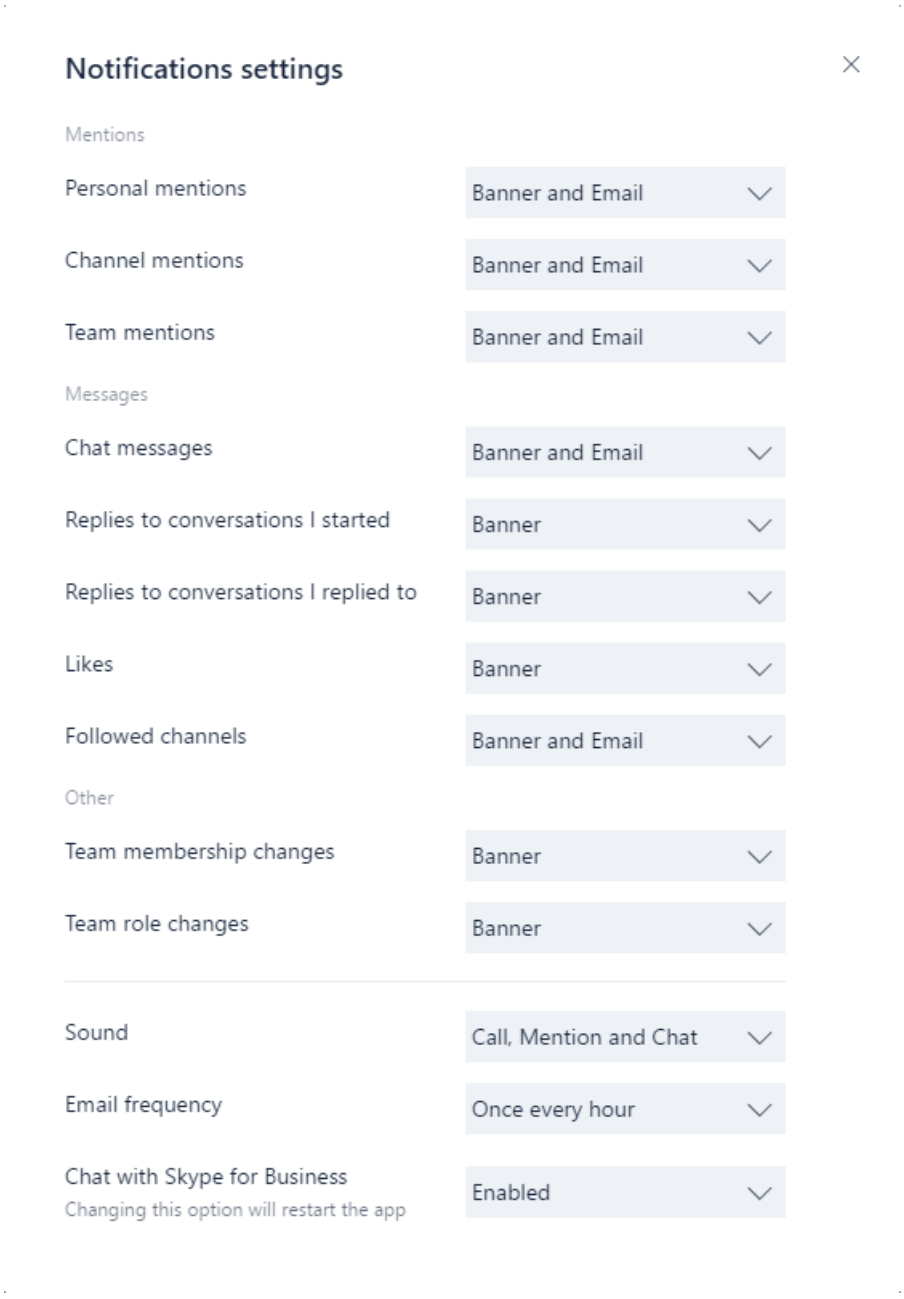
Clients are currently updated automatically by the Microsoft Teams service with no IT administrator intervention required. If an update is available, the client will automatically download the update and when the app has idled for a period of time, the update process will begin.

Client-side configurations

Currently, there are no supported options available to configure the client either through the tenant admin, PowerShell, Group Policy Objects or the registry.

Notification settings

There are currently no options available for IT administrators to configure client-side notification settings. All notification options are set by the user. The figure below outlines the default client settings.



Sample PowerShell script - inbound firewall rule

This sample script, which needs to run on client computers in the context of an elevated administrator account, will create a new inbound firewall rule for each user folder found in c:\users. When Teams finds this rule, it will prevent the Teams application from prompting users to create firewall rules when the users make their first call from Teams.

```
<#
.SYNOPSIS
   Creates firewall rules for Teams.
.DESCRIPTION
   (c) Microsoft Corporation 2018. All rights reserved. Script provided as-is without any warranty of any
kind. Use it freely at your own risks.
   Must be run with elevated permissions. Can be run as a GPO Computer Startup script, or as a Scheduled
Task with elevated permissions.
   The script will create a new inbound firewall rule for each user folder found in c:\users.
   Requires PowerShell 3.0.
#>

#Requires -Version 3

$users = Get-ChildItem (Join-Path -Path $env:SystemDrive -ChildPath 'Users') -Exclude 'Public', 'ADMINI~*'
if ($null -ne $users) {
    foreach ($user in $users) {
        $progPath = Join-Path -Path $user.FullName -ChildPath
"AppData\Local\Microsoft\Teams\Current\Teams.exe"
        if (Test-Path $progPath) {
            if (-not (Get-NetFirewallApplicationFilter -Program $progPath -ErrorAction SilentlyContinue)) {
                $ruleName = "Teams.exe for user $($user.Name)"
                "UDP", "TCP" | ForEach-Object { New-NetFirewallRule -DisplayName $ruleName -Direction
Inbound -Profile Domain -Program $progPath -Action Allow -Protocol $_ }
                Clear-Variable ruleName
            }
        }
        Clear-Variable progPath
    }
}
```

Get Microsoft Teams for Android in China

8/6/2020 • 2 minutes to read • Edit Online

If you're in China, use the links in this article to get Microsoft Teams for Android through one of several stores in China.

STORE	QR CODE
Lenovo: https://aka.ms/TeamsLenovo	
Xiaomi: https://aka.ms/TeamsXiaomi	
Huawei: https://aka.ms/TeamsHuawei	

STORE	QR CODE
Oppo: search for "Teams" in the Oppo store	
Baidu: https://aka.ms/teams_baidu_direct_dl	

For information about getting other mobile Teams clients, see Get clients for Teams.

Hardware requirements for Microsoft Teams

12/5/2020 • 3 minutes to read • Edit Online

All of the requirements in the following sections apply to both the Microsoft Teams desktop app and the Teams Web app.

Hardware requirements for Teams on a Windows PC

COMPONENT	REQUIREMENT
Computer and processor	Minimum 1.6 GHz (or higher), 2 core
Memory	4.0 GB RAM
Hard disk	3.0 GB of available disk space
Display	1024 x 768 screen resolution
Graphics hardware	Windows OS: Graphics hardware acceleration requires DirectX 9 or later, with WDDM 2.0 or higher for Windows 10 (or WDDM 1.3 or higher for Windows 10 Fall Creators Update)
Operating system	Windows 10, Windows 10 on ARM, Windows 8.1, Windows Server 2019, Windows Server 2016
.NET version	Requires .NET 4.5 CLR or later
Video	USB 2.0 video camera
Devices	Standard laptop camera, microphone, and speakers
Video calls and meetings	• Requires 2-core processor. For higher video/screen share resolution and frame rate, a 4-core processor or better is recommended. • Background video effects require Windows 10 or a processor with AVX2 instruction set. • See Hardware decoder and encoder driver recommendations for a list of unsupported decoders and encoders. • Joining a meeting using proximity detection in a Microsoft Teams Room requires Bluetooth LE, which requires Bluetooth to be enabled on the client device, and for Windows clients it also requires the 64-bit Teams client. This feature is not available on 32-bit Teams clients.
Teams live events	If you are producing a Teams live event, we recommend using a computer that has a Core i5 Kaby Lake processor, 4.0-GB RAM (or higher), and hardware encoder. See Hardware decoder and encoder driver recommendations for a list of **unsupported** decoders and encoders.

Hardware requirements for Teams on a Mac

COMPONENT	REQUIREMENT
Computer and processor	Intel Core Duo processor
Memory	4.0 GB RAM
Hard disk	1.5 GB of available disk space
Display	1280 x 800 or higher resolution
Operating system	One of the three most recent versions of macOS. You can find information about the latest macOS versions, and how to upgrade your version of macOS, here. For example, when a new version of macOS is released, the new version and the two immediately preceding it become the supported versions.
Video	Compatible webcam
Voice	Compatible microphone and speakers, headset with microphone, or equivalent device
Video calls and meetings	• Requires 2-core processor. For higher video/screen share resolution and frame rate, a 4-core processor or better is recommended. • Joining a meeting using proximity detection in a Microsoft Teams Room is not available on macOS.

Hardware requirements for Teams on Linux

COMPONENT	REQUIREMENT
Computer and processor	1.6 GHz (or higher) (32-bit or 64-bit), 2 core
Memory	4.0 GB RAM
Hard disk	3.0 GB of available disk space
Display	1024 x 768 screen resolution
Graphics hardware	128 MB graphics memory
Operating system	Linux distribution capable of installing DEB or RPM.
Video	USB 2.0 video camera
Devices	Standard laptop camera, microphone, and speakers
Voice	Compatible microphone and speakers, headset with microphone, or equivalent device

COMPONENT	REQUIREMENT
Video calls and meetings	• Requires 2-core processor. For higher video/screen share resolution and frame rate, a 4-core processor or better is recommended. • Joining a meeting using proximity detection in a Microsoft Teams Room is not available on Linux.
Supported Linux distributions	Ubuntu 18.04 LTS, 20.04 LTS, Fedora 30 Workstation, RHEL 8 Workstation, CentOS 8
Supported Desktop environment	GNOME, KDE
Supported Display server	X11

Hardware requirements for Teams on mobile devices

You can use Teams on these mobile platforms:

- Android: Compatible with Android phones and tablets.

  Support is limited to the **last four** major versions of Android. For example, when a new, major version of Android is released, the Android requirement is the new version and the three most recent versions that precede it.

- iOS: Compatible with iPhone, iPad, and iPod touch.

  Support is limited to the **two** most recent major versions of iOS. For example, when a new, major version of iOS is released, the iOS requirement is the new version and the most recent versions that preceded it. The optional **Blur my background** video effect on iOS requires an operating system of iOS 12 or later, compatible with the following devices: iPhone 7 or later, iPad 2018 (6th generation) or later, and the iPod touch 2019 (7th generation).

> **NOTE**
> For the best experience with Teams, use the latest version of iOS and Android.

Hardware requirements for Teams in a Virtual Desktop Infrastructure (VDI) environment

See Teams for Virtualized Desktop Infrastructure for requirements for running Teams in a virtualized environment.

Related topics

- Get Teams apps
- Microsoft Teams on mobile devices
- Install the Microsoft Teams app using an MSI
- Limits and specifications for Microsoft Teams

Hardware decoder and encoder driver recommendations

8/6/2020 • 4 minutes to read • Edit Online

Microsoft supports all decoders and encoders except those listed in this article.

Hardware decoder driver recommendations - Intel

The following combinations of operating system, model, and driver are not enabled for hardware acceleration due to various driver issues.

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0116	[2,0,11,929]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0126	[0.0.0.0] - [8.15.10.2418]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[0.0.0.0] - [8.15.10.2753]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x2772	[8.15.10.1749]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0162, 0x0166	[0.0.0.0] - [9.17.10.2850]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[9.17.10.2867] - [9.17.10.4459]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x1616	[9.18.7.9]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[10.18.10.3431] - [10.18.10.4425]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[10.18.14.4280]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x1616	[10.18.15.4256]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x1916	[10.18.15.4293]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[10.18.15.4281]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[20.19.15.4390] - [20.19.15.4444]

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 10	all	[21.20.16.4541]
Windows 10	all	[22.20.16.4811]
Windows 10	all	[24.20.100.6293]

Hardware decoder driver recommendations - Nvidia

The following combinations of operating system, model, and driver are not enabled for hardware acceleration due to various driver issues.

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0540	[8.15.1.1243]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A20	[8.15.11.8627], [8.15.11.8634], [8.15.11.8642]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A34	[8.15.11.8631], [8.15.11.8636], [8.15.11.8652], [8.15.11.8662], [8.15.11.8664], [8.16.11.8691]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A74	[8.15.11.8636], [8.15.11.8652], [8.15.11.8688]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A28	[8.15.11.8644]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A69	[8.16.11.8691]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A3C	[0.0.0.0] - [8.17.12.6721]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0873	[8.17.12.8562]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x040C, 0x0429, 0x06FD	[0.0.0.0] - [8.17.12.9670]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[8.17.11.9745], [8.17.12.5738]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x0A2B	[0.0.0.0] - [9.18.13.282]
Windows 7/Windows 8/Windows 8.1/Windows 10	0x087D	[9.18.13.697]

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	0x1040	[0.0.0.0] - [9.18.13.1106]
Windows 10	all	[10.18.13.5891] - [10.18.13.6881]
Windows 10	all	[21.21.13.6909], [21.21.13.7570]
Windows 7	all	[21,21,13,4201]

Hardware decoder driver recommendations - AMD

For legacy operating systems, only the following Device_ids are enabled for hardware acceleration.

OPERATING SYSTEM	MODEL (DEVICE_ID)
Windows 7/ Windows 8/ Windows 8.1	0x9874, 0x9851, 0x9853, 0x9854, 0x9855, 0x9856, 0x9857, 0x9858, 0x9857, 0x9858, 0x9859, 0x985A, 0x985B, 0x985C, 0x985D, 0x985E, 0x985F, 0x98E4, 0x67DF, 0x67C0, 0x67C2, 0x67C4, 0x67C7, 0x67D0, 0x67EF, 0x67FF, 0x67E0, 0x67E1, 0x67E8, 0x67E9, 0x67EB, 0x67DF, 0x67EF, 0x67FF, 0x6981, 0x6987, 0x6900, 0x694C, 0x694E, 0x694F, 0x6860, 0x6861, 0x6862, 0x6863, 0x6864, 0x6867, 0x6868, 0x6869, 0x686A, 0x686B, 0x686C, 0x686D, 0x686E, 0x687F, 0x69A0, 0x69A1, 0x69A2, 0x69A3, 0x69AF, 0x66A0, 0x66A1, 0x66A2, 0x66AF

The following combinations of operating system, model, and driver are not enabled for hardware acceleration due to various driver issues.

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[0.0.0.0] – [25.20.15017.1009]

Hardware encoder driver recommendations - Intel

The following combinations of operating system, model, and driver are not enabled for hardware acceleration due to various driver issues.

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7	all	[8.15.10.2200] - [8.15.10.2600]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[8.15.10.2653] - [8.15.10.2827]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[9.14.3.1176] - [9.14.3.1177]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[9.17.10.2800] - [9.17.10.9999]

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[9.18.10.3222]
Windows 7	all	[9.18.10.3234]
Windows 7	all	[9.18.10.3272]
Windows 7	all	[10.18.10.3242] - [10.18.10.9999]
Windows 8/Windows 8.1/Windows 10	all	[10.18.10.0000] - [10.18.10.9999]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[10.18.14.4153] - [10.18.14.4161]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[10.18.14.4264]
Windows 7	all	[10.18.14.4578]
Windows 7	all	[10.18.14.4889]
Windows 7	all	[10.18.14.5057]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[20.19.15.4300] - [20.19.15.4444]
Windows 7	all	[20.19.15.4474]

Hardware encoder driver recommendations - Nvidia

The following combinations of operating system, model, and driver are not enabled for hardware acceleration due to various driver issues.

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[0.0.0.0] - [21.21.13.7848]

Hardware encoder driver recommendations - AMD

For legacy operating systems, only the following Device_ids are enabled for hardware acceleration.

OPERATING SYSTEM	MODEL (DEVICE_ID)

OPERATING SYSTEM	MODEL (DEVICE_ID)
Windows 7	0x9874, 0x9850, 0x9851, 0x9852, 0x9853, 0x9854, 0x9855, 0x9856, 0x9857, 0x9858, 0x9859, 0x985A, 0x985B, 0x985C, 0x985D, 0x985E, 0x985F, 0x98E4, 0x67C0, 0x67C1, 0x67C2, 0x67C3, 0x67C4, 0x67C5, 0x67C6, 0x67C7, 0x67C8, 0x67C9, 0x67CA, 0x67CB, 0x67CC, 0x67CD, 0x67CE, 0x67CF, 0x67D0, 0x67D1, 0x67D2, 0x67D3, 0x67D4, 0x67D5, 0x67D6, 0x67D7, 0x67D8, 0x67D9, 0x67DA, 0x67DB, 0x67DC, 0x67DD, 0x67DE, 0x67DF, 0x67E0, 0x67E1, 0x67E2, 0x67E3, 0x67E4, 0x67E5, 0x67E6, 0x67E7, 0x67E8, 0x67E9, 0x67EA, 0x67EB, 0x67EC, 0x67ED, 0x67EE, 0x67EF, 0x67F0, 0x67F1, 0x67F2, 0x67F3, 0x67F4, 0x67F5, 0x67F6, 0x67F7, 0x67F8, 0x67F9, 0x67FA, 0x67FB, 0x67FC, 0x67FD, 0x67FE, 0x67FF, 0x1304, 0x1305, 0x1306, 0x1307, 0x1308, 0x1309, 0x130A, 0x130B, 0x130C, 0x130D, 0x130E, 0x130F, 0x1310, 0x1311, 0x1312, 0x1313, 0x1314, 0x1315, 0x1316, 0x1317, 0x1318, 0x1319, 0x131A, 0x131B, 0x131C, 0x131D, 0x131E, 0x131F, 0x66A0, 0x66A1, 0x66A2, 0x66A3, 0x66A4, 0x66A7, 0x66AF, 0x6860, 0x6861, 0x6862, 0x6863, 0x6864, 0x6867, 0x6868, 0x6869, 0x686A, 0x686B, 0x686D, 0x686E, 0x687F, 0x69A0, 0x69A1, 0x69A2, 0x69A3, 0x69AF

The following combinations of operating system, model, and driver are not enabled for hardware acceleration due to various driver issues.

OPERATING SYSTEM	MODEL (DEVICE_ID)	DRIVER/RANGE
Windows 7/Windows 8/Windows 8.1/Windows 10	0x674a	[0.0.0.0] – [99.9999.9999.9999]
Windows 7	all	[0.0.0.0] - [16.199.9999.9999]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[15.21.0.0] - [16.199.9999.9999]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[15.201.1101.0]
Windows 7/Windows 8/Windows 8.1/Windows 10	all	[21.19.137.1]

Related topics

Hardware requirements for the Teams app

Install Microsoft Teams using Microsoft Endpoint Configuration Manager

12/5/2020 • 5 minutes to read • Edit Online

TIP

Watch the following session to learn about the benefits of the Windows Desktop Client, how to plan for it and how to deploy it: Teams Windows Desktop Client.

To use Microsoft Endpoint Configuration Manager, or Group Policy, or any third-party distribution mechanisms for broad deployment, Microsoft has provided MSI files (both 32-bit and 64-bit) that admins can use for bulk deployment of Teams to select users or computers. Admins can use these files to remotely deploy Teams so that users do not have to manually download the Teams app. When deployed, Teams will auto launch for all users who sign in on that machine. (You can disable auto launch after installing the app. See below.) We recommend that you deploy the package to the computer, so all new users of the machine will also benefit from this deployment.

These are the links to the MSI files:

ENTITY	32-BIT	64-BIT	ARM64
Commercial	32-bit	64-bit	ARM64
Federal Government - GCC	32-bit	64-bit	ARM64
Federal Government - GCC High	32-bit	64-bit	ARM64
Federal Government - DoD	32-bit	64-bit	ARM64

To ensure a successful deployment, be aware of the following:

- Install the 64-bit version of Teams on 64-bit operating systems. If you try to install the 64-bit version of Teams on a 32-bit operating system, the installation won't be successful and currently you won't receive an error message.
- If the customer tenant is on the GCCH or DoD clouds, the customer should set the initial endpoint in the registry by adding the **CloudType** value to the **HKEY_CURRENT_USER\SOFTWARE\Policies\Microsoft\Office\16.0\Teams** key in the registry. The type for **CloudType** is **DWORD** and values are (0 = Unset, 1 = commercial, 2 = GCC, 3 = GCCH, 4 = DOD). Setting the endpoint with the registry key restricts Teams to connecting to the correct cloud endpoint for pre-sign-in connectivity with Teams.
- Teams can also be included with a deployment of Microsoft 365 Apps for enterprise. For more information, see Deploy Microsoft Teams with Microsoft 365 Apps for enterprise.
- To learn more about Microsoft Endpoint Configuration Manager, see What is Configuration Manager?

Deployment procedure (recommended)

1. Retrieve the latest package.

2. Use the defaults prepopulated by the MSI.
3. Deploy to computers when possible.

How the Microsoft Teams MSI package works

PC installation

The Teams MSI will place an installer in Program Files. Whenever a user signs into a new Windows User Profile, the installer will be launched and a copy of the Teams app will be installed in that user's `AppData` folder. If a user already has the Teams app installed in the `AppData` folder, the MSI installer will skip the process for that user.

Do not use the MSI to deploy updates, because the client will auto update when it detects a new version is available from the service. To re-deploy the latest installer use the process of redeploying MSI described below. If you deploy an older version of the MSI package, the client will auto-update (except in VDI environments) when possible for the user. If a very old version gets deployed, the MSI will trigger an app update before the user is able to use Teams.

> **IMPORTANT**
> The default location is C:\Program Files (x86)\Teams Installer on 64-bit operating systems and C:\Program Files\Teams Installer on 32-bit operating systems. We don't recommended that you change the default install locations, as this could break the update flow. Having too old a version will eventually block users from accessing the service.

Target computer requirements

- .NET framework 4.5 or later
- Windows 8.1 or later
- Windows Server 2012 R2 or later
- 3 GB of disk space for each user profile (recommended)

VDI installation

For complete guidance on how to deploy the Teams desktop app on VDI, see Teams for Virtualized Desktop Infrastructure.

Clean up and redeployment procedure

If a user uninstalls Teams from their user profile, the MSI installer will track that the user has uninstalled the Teams app and no longer install Teams for that user profile. To redeploy Teams for this user on a particular computer where it was uninstalled, do the following:

> **IMPORTANT**
> The next steps contain information about how to modify the registry. Make sure that you back up the registry before you modify it and that you know how to restore the registry if a problem occurs. For more information about how to back up, restore, and modify the registry, see Windows registry information for advanced users.

1. Uninstall the Teams app installed for every user profile. For more information, see Uninstall Microsoft Teams.
2. Delete the directory recursively under `%localappdata%\Microsoft\Teams\`.
3. Delete the `HKEY_CURRENT_USER\Software\Microsoft\Office\Teams\PreventInstallationFromMsi` registry value.
4. Redeploy the MSI package to that particular computer.

TIP

You can also use our Teams deployment clean up script to complete steps 1 and 2.

Prevent Teams from starting automatically after installation

The default behavior of the MSI is to install the Teams app as soon as a user signs in and then automatically start Teams. If you don't want Teams to start automatically for users after it's installed, you can use Group Policy to set a policy setting or disable auto launch for the MSI installer.

Use Group Policy (recommended)

Enable the **Prevent Microsoft Teams from starting automatically after installation** Group Policy setting. You can find this policy setting in User Configuration\Policies\Administrative Templates\Microsoft Teams. This is the recommended method because you can turn off or turn on the policy setting according to your organization's needs.

When you enable this policy setting before Teams is installed, Teams doesn't start automatically when users log in to Windows. After a user signs in to Teams for the first time, Teams starts automatically the next time the user logs in.

To learn more, see Use Group Policy to prevent Teams from starting automatically after installation.

Caution

If you've already deployed Teams and want to set this policy to disable Teams autostart, first set the Group Policy setting to the value you want, and then run the Teams autostart reset script on a per-user basis.

Disable auto launch for the MSI installer

You can disable auto launch for the MSI installer by using the **OPTIONS="noAutoStart=true"** parameter as follows.

For the 32-bit version:

```
msiexec /i Teams_windows.msi OPTIONS="noAutoStart=true" ALLUSERS=1
```

For the 64-bit version:

```
msiexec /i Teams_windows_x64.msi OPTIONS="noAutoStart=true" ALLUSERS=1
```

When a user logs in to Windows, Teams is installed with the MSI and a shortcut to start Teams is added to the user's desktop. Teams won't start until the user manually starts Teams. After the user manually starts Teams, Teams automatically starts whenever the user logs in.

Note that these examples also use the **ALLUSERS=1** parameter. When you set this parameter, Teams Machine-Wide Installer appears in Programs and Features in Control Panel and in Apps & features in Windows Settings for all users of the computer. All users can then uninstall Teams if they have admin credentials on the computer.

NOTE

If you run the MSI manually, be sure to run it with elevated permissions. Even if you run it as an administrator, without running it with elevated permissions, the installer won't be able to configure the option to disable auto start.

Turn on Teams in your organization

8/6/2020 • 2 minutes to read • Edit Online

> **IMPORTANT**
>
> The Microsoft Teams admin center is gradually replacing the Skype for Business admin center, and we're migrating Teams settings to it from the Microsoft 365 admin center. If a setting has been migrated, you'll see a notification and then be directed to the setting's location in the Teams admin center. For more information, see Manage Teams during the transition to the Teams admin center.

By default, Teams is turned on for all organizations. If you used Teams during the preview period, the setting stays the same as what you set during your Teams preview.

As an administrator for your organization, you can assign user licenses to control individual access to Teams, and you can allow or block what content sources can be used in Teams. See Manage Microsoft Teams settings for your organization or Admin settings for apps in Microsoft Teams for more information.

To learn more about managing individual licenses, read Microsoft Teams service description.

Turn Teams on or off for your entire organization

Tenant-level control for Teams was removed effective August 2018. Control access to Teams in your organization with user-level licensing. To learn more, see Manage user access to Teams.

The exception to this change is Microsoft Teams for Education (EDU). You can still manage Teams at the organization level if you have an EDU license. To do this, go to the Microsoft 365 admin center > **Settings** > **Services and add-ins** > **Microsoft Teams**. If you're using the new Teams admin center, you'll have to turn off **Try the new admin center** to find **Services and add-ins**.

> **IMPORTANT**
>
> You may have to wait up to 24 hours for your changes to take effect.

How Microsoft Teams uses memory

12/5/2020 • 2 minutes to read • Edit Online

Some Microsoft Teams users have questions about how Teams uses memory. This article describes how memory is used by Teams, and why the Teams desktop application (app) and the Teams web app do not prevent other apps and workloads on the same computer from having enough memory to run optimally. Teams is designed to use modern web technology. To achieve this, the Teams desktop client was developed on Electron, which uses Chromium for rendering. This is the same rendering engine behind many of today's most popular browsers, including Edge and Chrome.

How Teams works

Teams being designed on Electron allows for faster development, and it also maintains parity between Teams versions across different operating systems (Windows, Mac, and Linux). This parity is possible because Electron and Chromium maintain a similar code base across all versions. Another advantage of this architecture is there's a similar memory usage profile between the Teams web app and the desktop version. Both the web app and the desktop versions use memory in a similar way to how a browser would use it. More information about Electron is available at their Web site.

See Chromium Memory Usage and Key Concepts in Chrome Memory for more information.

The following image shows side-by-side memory usages of the Teams desktop app for Windows and the Teams Web app (in this example, running in Google Chrome).

Name	Status	2% CPU	13% Memory	0% Disk	0% Network	3% GPU
Apps (4)						
Google Chrome (9)		0%	583.7 MB	0.1 MB/s	0.1 Mbps	0%
Microsoft Teams (32 bit) (7)		0.7%	545.5 MB	0 MB/s	0 Mbps	2.6%

Memory usage in Teams

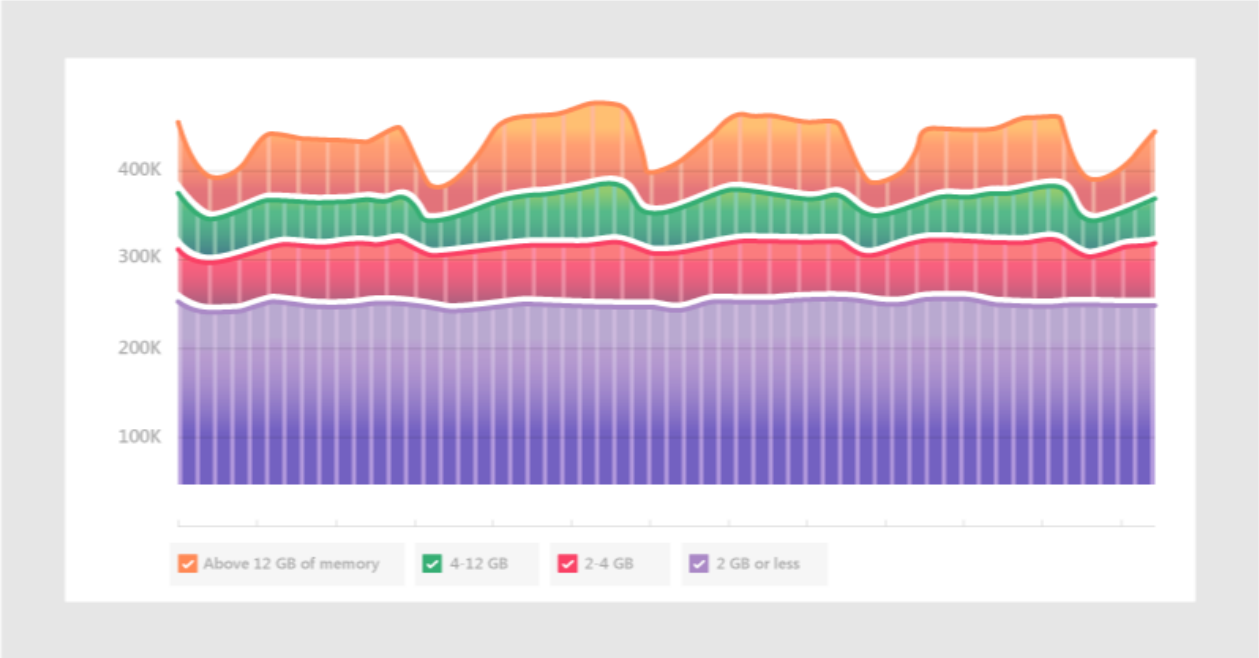
It is important to understand the *expected* behavior of Teams when it comes to system memory, and to know the symptoms of truly problematic system memory issues.

Expected memory usage by Teams

Whether you're running the Teams desktop app or the Teams web app, Chromium detects how much system memory is available and utilizes enough of that memory to optimize the rendering experience. When other apps or services require system memory, Chromium gives up memory to those processes. Chromium tunes Teams memory usage on an ongoing basis in order to optimize Teams performance without impacting anything else currently running.

In this way, similar Chromium workloads can utilize varying amounts of memory, depending on the amount of system memory that is available.

The following graph depicts memory usage by Teams on four separate systems, each with different amounts of memory available. Each of the systems is processing similar workloads (same apps open and running).



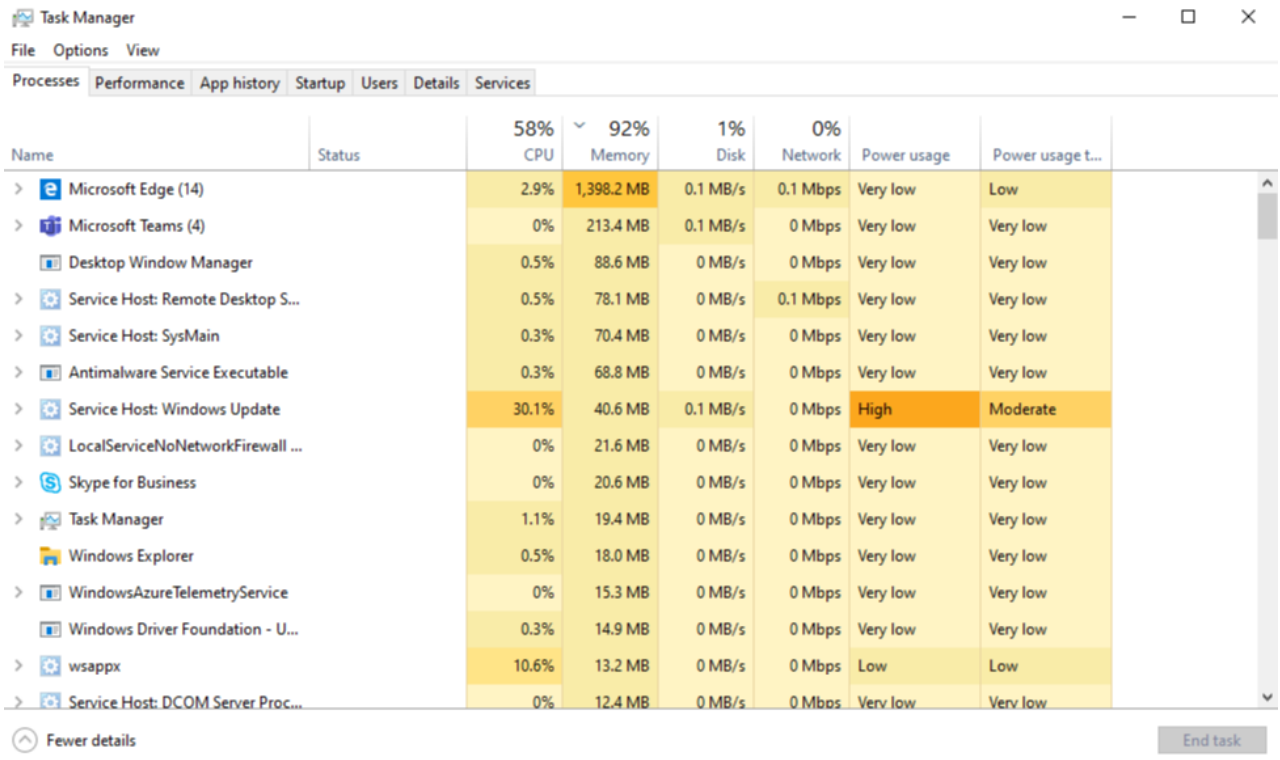
When computers have more memory, Teams will use that memory. In systems where memory is scarce, Teams will use less.

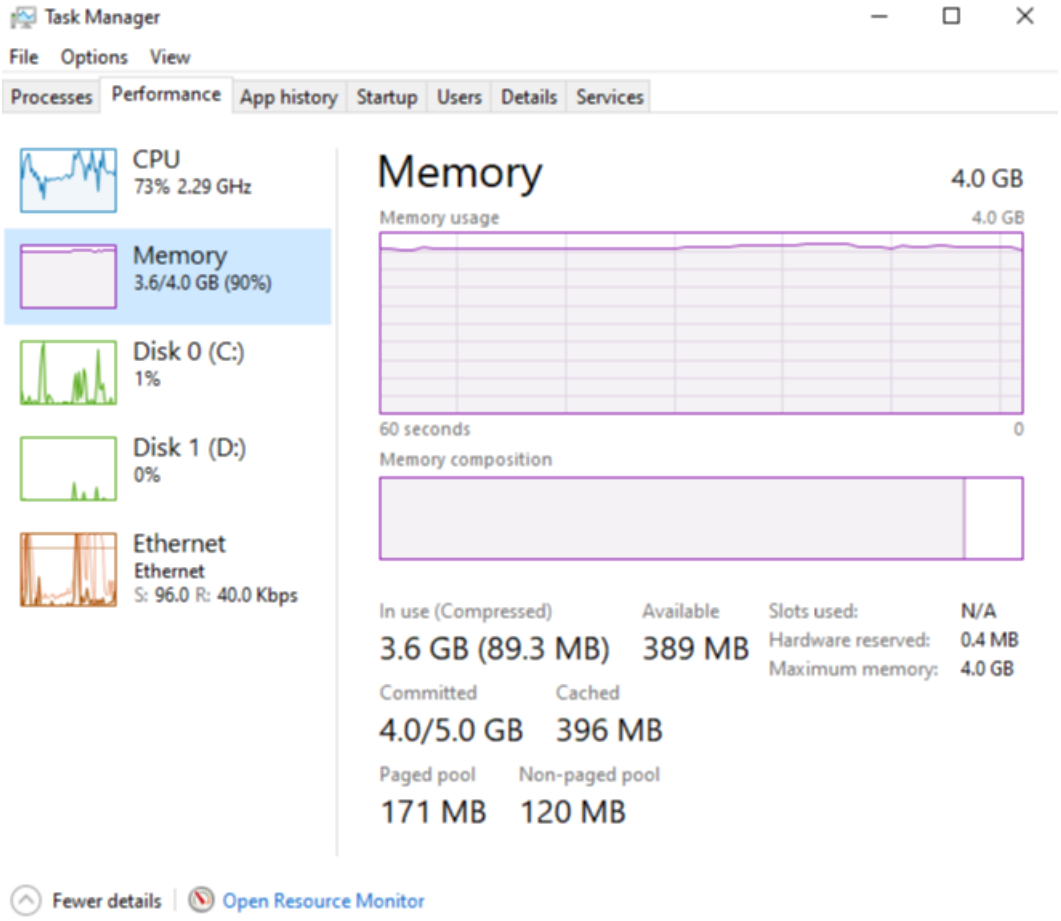
Symptoms of system memory issues

If you see one or more of the following symptoms on your computer, you could have a serious system memory issue:

- High memory use when multiple large applications are running simultaneously.
- Slow system performance or applications hanging.
- Sustained overall system memory usage of 90% or higher across all apps. With this amount of memory usage, Teams should be giving memory back to other apps and workloads. Sustained memory usage of 90% could mean Teams isn't giving memory back to the system, which indicates a problem.

The following images show examples of views in Task Manager when system memory usage is abnormally high.




Task Manager
File Options View
Processes Performance App history Startup Users Details Services
CPU
73% 2.29 GHz
Memory
3.6/4.0 GB (90%)
Disk 0 (C:)
1%
Disk 1 (D:)
0%
Ethernet
Ethernet
S: 96.0 R: 40.0 Kbps
Memory
4.0 GB
Memory usage
4.0 GB
60 seconds
0
Memory composition
In use (Compressed)
3.6 GB (89.3 MB)
Available
389 MB
Slots used: N/A
Hardware reserved: 0.4 MB
Maximum memory: 4.0 GB
Committed
4.0/5.0 GB
Cached
396 MB
Paged pool
171 MB
Non-paged pool
120 MB
Fewer details
Open Resource Monitor

Microsoft 365 and Office 365 URLs and IP address ranges

11/2/2020 • 2 minutes to read • Edit Online

Go to Microsoft 365 and Office 365 URLs and IP address ranges for a detailed and up-to-date list of the URLs, IP addresses, ports, and protocols that must be correctly configured for Teams. Microsoft is continuously improving the Microsoft 365 and Office 365 services and adding new functionality, which means the required ports, URLs, and IP addresses may change over time. We recommend that you subscribe via RSS to receive notifications when this information is updated or changed.

The Teams calling and meetings experience is built on the next generation cloud-based infrastructure that is also used by Skype and Skype for Business. These technology investments include Azure-based cloud services for media processing and signaling, H.264 video codec, SILK and Opus audio codec, network resiliency, telemetry, and quality diagnostics. As such, there are URLs and IPs that are required that may be associated with both Skype and Skype for Business.

For all Microsoft 365 and Office 365 workloads, the recommended connection method to Teams services is bypassing the forward proxy where possible. When a proxy server sits between a client and the Office 365 data centers, media might be forced over TCP instead of UDP, which would impact media quality. Download sample proxy PAC files that can be used to configure traffic bypass from Managing Microsoft 365 and Office 365 endpoints.

If your networking and security policies require Microsoft 365 or Office 365 traffic to flow through a proxy server, make sure that the above requirements are already met before deploying Teams into production. For more information, read Proxy Servers for Teams or Skype for Business Online.

Teams for Virtualized Desktop Infrastructure

12/5/2020 • 18 minutes to read • Edit Online

This article describes the requirements and limitations for using Microsoft Teams in a virtualized environment.

What is VDI?

Virtual Desktop Infrastructure (VDI) is virtualization technology that hosts a desktop operating system and applications on a centralized server in a data center. This enables a fully personalized desktop experience to users with a fully secured and compliant centralized source.

Microsoft Teams in a virtualized environment supports chat and collaboration. And with the Windows Virtual Desktop, Citrix, and VMware platforms, calling and meeting functionality is also supported.

Teams in a virtualized environment supports multiple configurations. These include VDI, dedicated, shared, persistent, and non-persistent modes. Features are in continuous development and are added on a regular basis, and functionality will expand in the coming months and years.

Using Teams in a virtualized environment might be somewhat different from using Teams in a non-virtualized environment. For example, some advanced features might not be available in a virtualized environment, and video resolution might differ.

To ensure an optimal user experience, follow the guidance in this article.

> **NOTE**
> For details about Teams VDI on different platforms, see Teams features by platform.

Teams on VDI components

Using Teams in a virtualized environment requires the following components.

- **Virtualization broker**: The resource and connection manager to the virtualization provider, such as Azure
- **Virtual desktop**: The Virtual Machine (VM) stack that runs Microsoft Teams
- **Thin client**: The endpoint that the user physically interfaces with
- **Teams desktop app**: The Teams desktop client app

Teams on VDI requirements

Virtualization provider requirements

The Teams desktop app was validated with leading virtualization solution providers. With multiple market providers, we recommend that you consult your virtualization solution provider to ensure that you meet the minimum requirements.

Currently, Teams on VDI with audio/video (AV) optimization is certified with Windows Virtual Desktop, Citrix, and VMware. Review the information in this section to ensure that you meet all requirements for proper functionality.

Platforms certified for Teams

The following platforms have virtual desktop infrastructure solutions for Teams.

PLATFORM	SOLUTION
Microsoft	Windows Virtual Desktop
CITRIX	Citrix Virtual Apps and Desktops
vmware	VMware Horizon

Windows Virtual Desktop

Windows Virtual Desktop provides AV optimization for Teams on VDI. To learn more and requirements and installation, see Use Teams on Windows Virtual Desktop.

Citrix Virtual Apps and Desktops requirements

Citrix Virtual Apps and Desktops (formerly known as XenApp and XenDesktop) provides AV optimization for Teams on VDI. With Citrix Virtual Apps and Desktops, Teams on VDI supports calling and meeting functionality in addition to chat and collaboration.

You can download the latest version of Citrix Virtual Apps and Desktops at the Citrix downloads site. (You'll need to sign in first.) The necessary components are bundled into the Citrix Workspace app (CWA) and Virtual Delivery Agent (VDA) by default. You don't need to install any additional components or plugins on CWA or the VDA.

For the latest server and client requirements, see this Citrix website.

VMware Horizon Workspace and Desktop requirements

VMware Horizon is a modern platform for secure delivery of virtual desktops and apps across the hybrid cloud. To offer a great end-user experience, VMware Horizon provides media optimization for Teams. This optimization improves overall productivity across virtual desktops and apps, and enhances user experience when calling and meeting using Teams.

You can download the latest version of VMware Horizon from the VMware Downloads page. The required media optimization components are part of the Horizon Agent and Horizon Client by default and there's no need to install any additional plug-in to use the optimization feature for Teams.

To get the latest requirements and instructions on how to configure media optimization for Teams, see this VMware website.

Install or update the Teams desktop app on VDI

You can deploy the Teams desktop app for VDI using a per-machine installation or per-user installation using the MSI package. Deciding on which approach to use depends on whether you use a persistent or non-persistent setup and the associated functionality needs of your organization.

For a dedicated persistent setup, either approach would work. However, for a non-persistent setup, Teams requires a per-machine installation in order to work efficiently. See the Non-persistent setup section.

With per-machine installation, automatic updates is disabled. This means that to update the Teams app, you must uninstall the current version to update to a newer version. With per-user installation, automatic updates is enabled. For most VDI deployments, we recommend you deploy Teams using per-machine installation.

To update to the latest Teams version, start with the uninstall procedure followed by latest Teams version deployment.

For Teams AV optimization in VDI environments to work properly, the thin client endpoint must have access to the internet. If internet access isn't available at the thin client endpoint, optimization startup won't be successful. This

means that the user is in a non-optimized media state.

Dedicated persistent setup

In a dedicated persistent setup, users' local operating system changes are retained after users log off. For persistent setup, Teams supports both per-user and per-machine installation.

The following is the recommended minimum VM configuration.

PARAMETER	WORKSTATION OPERATING SYSTEM	SERVER OPERATING SYSTEM
vCPU	2 cores	4,6, or 8 It's important to understand the underlying non-uniform memory access (NUMA) configuration and configure your VMs accordingly.
RAM	4 GB	512 to 1024 MB per user
Storage	8 GB	40 to 60 GB

Non-persistent setup

In a non-persistent setup, users' local operating system changes are not retained after users log off. Such setups are commonly shared multi-user sessions. VM configuration varies based on the number of users and available physical box resources.

For a non-persistent setup, the Teams desktop app must be installed per-machine to the golden image. (To learn more, see the Install or update the Teams desktop app on VDI section.) This ensures an efficient launch of the Teams app during a user session.

Using Teams with a non-persistent setup also requires a profile caching manager for efficient Teams runtime data sync. This ensures that the appropriate user-specific information (for example, user data, profile, and settings) is cached during the user session. Make sure data in these two folders are synced.

- C:\Users\username\AppData\Local\Microsoft\IdentityCache (%localAppdata%\Microsoft\IdentityCache)
- C:\Users\username\AppData\Roaming\Microsoft\Teams (%appdata%\Microsoft\Teams)

There are a variety of caching manager solutions available. For example, FSLogix. Consult your caching manager provider for specific configuration instructions.

Teams cached content exclusion list for non-persistent setup

Exclude the following from the Teams caching folder, %appdata%/Microsoft/Teams. Excluding these items helps reduce the user caching size to further optimize your non-persistent setup.

- .txt files
- Media-stack folder
- meeting-addin\Cache (%appdata%\Microsoft\Teams\meeting-addin\Cache)

Microsoft 365 Apps for enterprise considerations

Consider the following when you deploy Teams with Microsoft 365 Apps for enterprise on VDI.

New deployments of Teams through Microsoft 365 Apps for enterprise

Before you deploy Teams through Microsoft 365 Apps for enterprise, you must first uninstall any pre-existing Teams apps if they were deployed using per-machine installation.

Teams through Microsoft 365 Apps for enterprise is installed per-user. To learn more, see the Install or update the Teams desktop app on VDI section.

Teams deployments through Microsoft 365 Apps for enterprise updates

Teams is also being added to existing installations of Microsoft 365 Apps for enterprise. Since Microsoft 365 Apps

for enterprise installs Teams per-user only, see the Install or update the Teams desktop app on VDI section.

Using Teams with per-machine installation and Microsoft 365 Apps for enterprise

Microsoft 365 Apps for enterprise doesn't support per-machine installations of Teams. To use per-machine installation, you must exclude Teams from Microsoft 365 Apps for enterprise. See the Deploy the Teams desktop app to the VM and How to exclude Teams deployment through Microsoft 365 Apps for enterprise sections.

How to exclude Teams deployment through Microsoft 365 Apps for enterprise

To learn more about Teams and Microsoft 365 Apps for enterprise, see How to exclude Teams from new installations of Microsoft 365 Apps for enterprise and Use Group Policy to control the installation of Teams.

Deploy the Teams desktop app to the VM

1. Download the Teams MSI package that matches your VDI VM operating system using one of the following links:

   - 32-bit version
   - 64-bit version

   > **NOTE**
   > For government clouds, see Install Microsoft Teams using Microsoft Endpoint Configuration Manager for the download links to the MSI files.

   The minimum version of the Teams desktop app that's required is version 1.3.00.4461. (PSTN hold isn't supported in earlier versions.)

2. Install the MSI to the VDI VM by running one of the following commands:

   - Per-user installation (default)

     ```
     msiexec /i <path_to_msi> /l*v <install_logfile_name> ALLUSERS=1
     ```

     This process is the default installation, which installs Teams to the %AppData% user folder. At this point, the golden image setup is complete. Teams won't work properly with per-user installation on a non-persistent setup.

   - Per-machine installation

     ```
     msiexec /i <path_to_msi> /l*v <install_logfile_name> ALLUSER=1 ALLUSERS=1
     ```

     This process installs Teams to the Program Files (x86) folder on a 64-bit operating system and to the Program Files folder on a 32-bit operating system. At this point, the golden image setup is complete. Installing Teams per-machine is required for non-persistent setups.

     The next interactive logon session starts Teams and asks for credentials.

     > **NOTE**
     > These examples also use the **ALLUSERS=1** parameter. When you set this parameter, Teams Machine-Wide Installer appears in Programs and Features in Control Panel and in Apps & features in Windows Settings for all users of the computer. All users can then uninstall Teams if they have admin credentials. It's important to understand the difference between **ALLUSERS=1** and **ALLUSER=1**. The **ALLUSERS=1** parameter can be used in non-VDI and VDI environments, while the **ALLUSER=1** parameter is used only in VDI environments to specify a per-machine installation.

3. Uninstall the MSI from the VDI VM. There are two ways to uninstall Teams.

   - PowerShell script: You can use this PowerShell script to uninstall Teams and remove the Teams folder for a user. Run the script for each user profile in which Teams was installed on the computer.
   - Command line: Run the following command.

     ```
     msiexec /passive /x <path_to_msi> /l*v <uninstall_logfile_name>
     ```

     This process uninstalls Teams from the Program Files (x86) folder or Program Files folder, depending on the operating system environment.

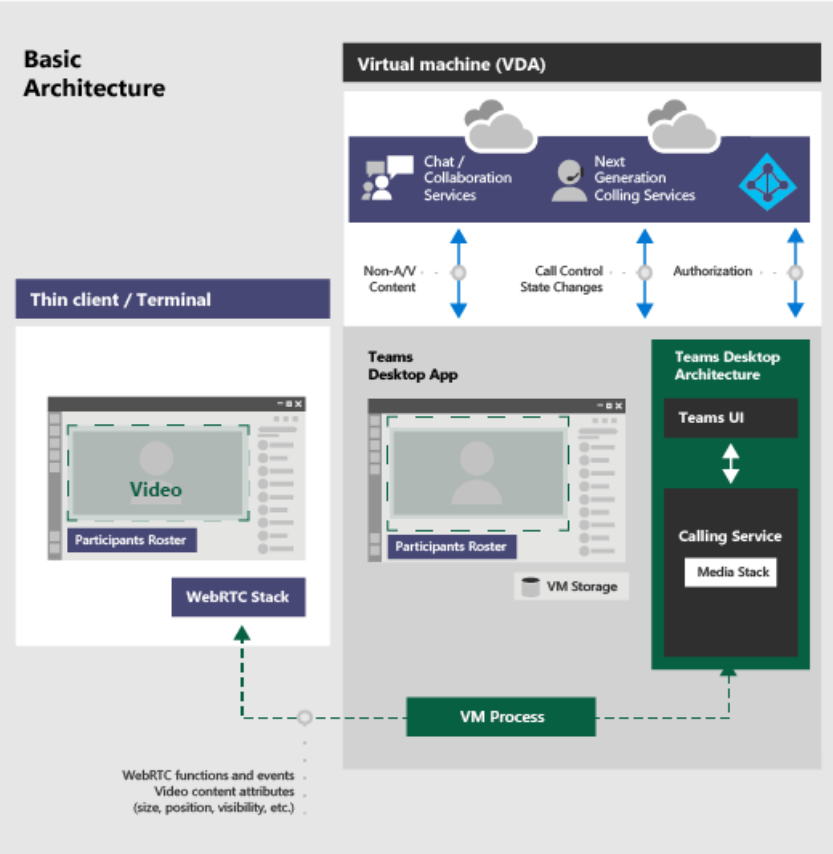
Teams on VDI performance considerations

There are a variety of virtualized setup configurations, each with a different focus for optimization. For example, a configuration might focus on user density. When planning, consider the following to help optimize your setup based on your organization's workload needs.

- Minimum requirement: Some workloads might require a setup using resources that are above the minimum requirements. For example, workloads for developers who use applications that demand more computing resources.
- Dependencies: These include dependencies on infrastructure, workload, and other environmental considerations outside the Teams desktop app.
- Disabled features on VDI: Teams disables GPU-intensive features for VDI, which can help improve transient CPU utilization. The following features are disabled:
  - Teams CSS animation
  - Giphy auto-start

Teams on VDI with calling and meetings

In addition to chat and collaboration, Teams on VDI with calling and meetings is available with supported virtualization provider platforms. Supported features are based on the WebRTC media stack and virtualization provider implementation. The following diagram provides an overview of the architecture.



IMPORTANT

If you currently run Teams without AV optimization in VDI and you use features that are not supported yet for optimization (such as Give and take control when app sharing), you have to set virtualization provider policies to turn off Teams redirection. This means that Teams media sessions won't be optimized. For steps on how to set policies to turn off Teams redirection, contact your virtualization provider.

Network requirements

We recommend that you evaluate your environment to identify any risks and requirements that can influence your overall cloud voice and video deployment. Use the Skype for Business Network Assessment Tool to test whether your network is ready for Teams.

To learn more about how to prepare your network for Teams, see Prepare your organization's network for Teams.

Migrate from Skype for Business on VDI to Teams on VDI

If you're migrating from Skype for Business on VDI to Teams on VDI, besides the differences between the two applications, there are some differences when VDI is also implemented. Some capabilities that aren't currently supported in Teams VDI that are in Skype for Business VDI are as follows:

- Per-platform policy to disable some AV features in VDI
- Give and take control when app sharing
- Screen share from chat without audio
- Simultaneous video and screen sharing send and receive

Teams on Chrome browser versus Teams desktop app for VDI

Teams on Chrome browser doesn't provide a replacement for the Teams desktop app for VDI with AV optimization. The chat and collaboration experience works as expected. When media is needed, there are some experiences that might not meet user expectations on the Chrome browser:

- The audio and video streaming experience might not be optimal. Users might experiences delays or reduced quality.

- Device settings aren't available in browser settings.
- Device management is handled through the browser and requires multiple settings in browser site settings.
- Device settings might also need to be set in Windows device management.

Teams on VDI with chat and collaboration

If your organization wants to only use chat and collaboration features in Teams, you can set user-level policies to turn off calling and meeting functionality in Teams.

Set policies to turn off calling and meeting functionality

You can set policies by using the Microsoft Teams admin center or PowerShell. It might take some time (a few hours) for the policy changes to propagate. If you don't see changes for a given account immediately, try again in a few hours.

Calling polices: Teams includes the built-in DisallowCalling calling policy, in which all calling features are turned off. Assign the DisallowCalling policy to all users in your organization who use Teams in a virtualized environment.

Meeting policies: Teams includes the built-in AllOff meeting policy, in which all meeting features are turned off. Assign the AllOff policy to all users in your organization who use Teams in a virtualized environment.

Assign policies using the Microsoft Teams admin center

To assign the DisallowCalling calling policy and the AllOff meeting policy to a user:

1. In the left navigation of the Microsoft Teams admin center, go to **Users**.
2. Select the user by clicking to the left of the user name, and then click **Edit settings**.
3. Do the following:
   a. Under **Calling policy**, click **DisallowCalling**.
   b. Under **Meeting policy**, click **AllOff**.
4. Click **Apply**.

To assign a policy to multiple users at a time:

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then search for the users or filter the view to show the users you want.
2. In the ✓ (check mark) column, select the users. To select all users, click the ✓ (check mark) at the top of the table.
3. Click **Edit settings**, make the changes that you want, and then click **Apply**.

Or, you can also do the following:

1. In the left navigation of the Microsoft Teams admin center, go to the policy you want to assign. For example:
   - Go to **Voice** > **Calling policies**, and then click **DisallowCalling**.
   - Go to **Meetings** > **Meeting policies**, and then click **AllOff**.
2. Select **Manage users**.
3. In the **Manage users** pane, search for the user by display name or by user name, select the name, and then click **Add**. Repeat this step for each user that you want to add.
4. When you're finished adding users, click **Save**.

Assign policies using PowerShell

The following example shows how to use the Grant-CsTeamsCallingPolicy to assign the DisallowCalling calling policy to a user.

```
Grant-CsTeamsCallingPolicy -PolicyName DisallowCalling -Identity "user email id"
```

To learn more about using PowerShell to manage calling policies, see Set-CsTeamsCallingPolicy.

The following example shows how to use the Grant-CsTeamsMeetingPolicy to assign the AllOff meeting policy to a user.

```
Grant-CsTeamsMeetingPolicy -PolicyName AllOff -Identity "user email id"
```

To learn more about using PowerShell to manage meeting policies, see Set-CsTeamsMeetingPolicy.

Migrate Teams on VDI with chat and collaboration to optimize Teams with calling and meetings

If you have an existing implementation of Teams on VDI with chat and collaboration in which you had set user-level policies to turn off calling and meeting functionality, and you're migrating to Teams with AV optimization, you must set policies to turn on calling and meeting functionality for those Teams on VDI users.

Set policies to turn on calling and meeting functionality

You can use the Microsoft Teams admin center or PowerShell to set and assign calling and meeting policies to your users. It can take some time (a few hours) for policy changes to propagate. If you don't see changes for a given account immediately, try again after a few hours.

Calling polices: Calling policies in Teams control which calling features are available to users. Teams includes the built-in AllowCalling calling policy, in which all calling features are turned on. To turn on all calling features, assign the AllowCalling policy. Or, create a custom calling policy to turn on the calling features that you want and assign it to users.

Meeting policies: Meeting policies in Teams control the types of meetings that users can create and the features that are available to meeting participants that are scheduled by users in your organization. Teams includes the built-in AllOn meeting policy, in which all meeting features are turned on. To turn on all meeting features, assign the AllOn policy. Or, create a custom meeting policy to turn on the meeting features that you want and assign it users.

Assign policies using the Microsoft Teams admin center

To assign the AllowCalling calling policy and the AllOn meeting policy to a user:

1. In the left navigation of the Microsoft Teams admin center, go to **Users**.
2. Select the user by clicking to the left of the user name, and then click **Edit settings**.
3. Do the following:
   a. Under **Calling policy**, click **AllowCalling**.
   b. Under **Meeting policy**, click **AllOn**.
4. Click **Apply**.

To assign a policy to multiple users at a time:

1. In the left navigation of the Microsoft Teams admin center, go to **Users**, and then search for the users or filter the view to show the users you want.
2. In the ✓ (check mark) column, select the users. To select all users, click the ✓ (check mark) at the top of the table.
3. Click **Edit settings**, make the changes that you want, and then click **Apply**.

Or, you can also do the following:

1. In the left navigation of the Microsoft Teams admin center, go to the policy you want to assign. For example:
   - Go to **Voice** > **Calling policies**, and then click **AllowCalling**.
   - Go to **Meetings** > **Meeting policies**, and then click **AllOn**.
2. Select **Manage users**.

3. In the **Manage users** pane, search for the user by display name or by user name, select the name, and then click **Add**. Repeat this step for each user that you want to add.
4. When you're finished adding users, click **Save**.

Assign policies using PowerShell

The following example shows how to use the Grant-CsTeamsCallingPolicy to assign the AllowCalling calling policy to a user.

```
Grant-CsTeamsCallingPolicy -PolicyName AllowCalling -Identity "user email id"
```

To learn more about using PowerShell to manage calling policies, see Set-CsTeamsCallingPolicy.

The following example shows how to use the Grant-CsTeamsMeetingPolicy to assign the AllOn meeting policy to a user.

```
Grant-CsTeamsMeetingPolicy -PolicyName AllOn -Identity "user email id"
```

To learn more about using PowerShell to manage meeting policies, see Set-CsTeamsMeetingPolicy.

Control fallback mode in Teams

When users connect from an unsupported endpoint, the users are in fallback mode, in which AV isn't optimized. You can disable or enable fallback mode by setting one of the following registry DWORD values:

- HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Teams\DisableFallback
- HKEY_CURRENT_USER\SOFTWARE\Microsoft\Office\Teams\DisableFallback

To disable fallback mode, set the value to **1**. To enable audio only, set the value to **2**. If the value isn't present or is set to **0** (zero), fallback mode is enabled.

This feature is available in Teams version 1.3.00.13565 and later.

Known issues and limitations

Client deployment, installation, and setup

- With per-machine installation, Teams on VDI isn't automatically updated in the way that non-VDI Teams clients are. You have to update the VM image by installing a new MSI as described in the Install or update the Teams desktop app on VDI section. You must uninstall the current version to update to a newer version.
- Teams should be deployed either per user or per machine. Deployment of Teams for concurrent per user and per machine is not supported. To migrate from either per machine or per user to one of these modes, follow the uninstall procedure and redeploy to either mode.
- Windows Virtual Desktop and VMware don't support MacOS and Linux-based clients at this time.
- Citrix doesn't support MacOs clients at this time.
- Citrix doesn't support the use of explicit HTTP proxies defined on an endpoint.

Calling and meetings

The following calling and meeting features are not supported:

- Enhanced emergency services
- HID buttons and LED controls between the Teams app and devices
- Background blur and effects
- Broadcast and live event producer and presenter roles
- Location-Based Routing (LBR)

- Call park
- Call queue
- Shared system audio/computer sound
- Media bypass for Direct Routing

> **NOTE**
> We're working on adding calling and meeting features that are currently only available in non-VDI environments. These might include more admin control over quality, additional screen sharing scenarios, and advanced features recently added to Teams. Contact your Teams representative to learn more about upcoming features.

The following are known issues and limitations for calling and meetings:

- Interoperability with Skype for Business is limited to audio calls; there is no video modality.
- Only a single incoming video stream is supported in meetings or group calls. When multiple people send video, only the dominant speaker's video is shown at any given time.
- Incoming and outgoing video stream resolution is limited to 720p resolution. This is a WebRTC limitation.
- Only one video stream from an incoming camera or screen share stream is supported. When there's an incoming screen share, that screen share is shown, instead of the video of the dominant speaker.
- Teams doesn't switch to use the last audio device that a user selected, if the device is disconnected, and then reconnected.
- Outgoing screen sharing:
  - Application sharing is not supported.
- Give control and take control:
  - Not supported during a screen sharing or application sharing session.
  - Supported during a PowerPoint sharing session.
- Citrix-only limitations
  - When screen sharing in a multi-monitor setup, only the main monitor is shared.
  - High DPI scaling on CWA is not supported.

For Teams known issues that aren't related to VDI, see Support Teams in your organization.

Troubleshooting

Troubleshoot Citrix components

Teams crashes or the Teams sign in screen is blank

This is a known issue with Citrix VDA versions 1906 and 1909. To work around this issue, add the following registry DWORD value, and set it to 204 (hexadecimal).

HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\CtxHook\AppInit_Dlls\SfrHook\Teams.exe

Then, restart VDA. To learn more, see this Citrix support article, Troubleshooting HDX optimization for Teams.

Related topics

- Install Microsoft Teams using MSI
- Teams PowerShell overview
- Use Microsoft Teams on Windows Virtual desktop

Deploy Microsoft Teams for Surface Hub

4/27/2020 • 2 minutes to read • Edit Online

Before you install Teams for Surface Hub, be sure to do the following:

☐ Make sure hardware, operating system, and other requirements are met. For more information, see the Microsoft Surface Hub admin guide.
☐ Make sure the minimum operating system update required for Teams is installed - KB4343889.
☐ Assign a Teams license to the Hub device account.
☐ If you are transitioning from Skype for Business Online, confirm that a Teams license is assigned to the user.

Install Teams for Surface Hub from the Microsoft Store

These instructions are for installing Teams for Surface Hub from the Microsoft Store.

1. Start the Microsoft Store:
   a. Tap **Start** > **All Apps** > **Settings**.
   b. Tap **Surface Hub Device account, management**.
   c. On the left, tap the **Apps & Features** tab.
   d. On the right, tap the **Open Store** button.
2. From the Microsoft Store, search for *Microsoft Teams*. The **Microsoft Teams for Surface Hub** will be displayed. Tap the **Get the app** button to install.
3. When the installation is complete, restart the Surface Hub.

> **NOTE**
> Do not tap **Launch** from the Store listing page.

Make Teams the default calling and meetings application

There are two options for configuring the default calling and meetings application policy:

- **Option 1**: Configure via USB key.
- **Option 2**: Configure via MDM such as Intune.

Option 1: Configure via USB key

The packages can be found on this download page. Pick the appropriate one for the package that you're planning to install and copy it to a USB key. The correct .ppkg file to use depends on the default application policy you'd like to apply as follows:

NUMBER	DESCRIPTION
0	Skype preferred app on the Start Screen, Teams Meetings available
1	Teams preferred app on the Start Screen, Skype Meetings available
2	Teams exclusive app on the Start screen (Skype app not available)

1. Attach the USB key to the Surface Hub device.
2. Open the **Settings** app on a Surface Hub device.
3. Open **Surface Hub Device Account Management**.
4. Open **Device Management**.
5. Click **Add or Remove a provisioning package**.
6. Click **Add Package**.
7. Select the **Removable Media** option from the drop-down menu.
8. Add the appropriate **TeamsRTMMode*.ppkg** package that was previously copied to the USB key.
9. Restart the Surface Hub device.
10. After the device restarts, you should be able to start the Teams app from the Start screen and join a meeting from the calendar.

Option 2: Configure via MDM such as Intune

Use the following to configure the default calling and meetings application policy via Intune. Also see the blog, Deploy the Microsoft Teams for Surface Hub app using Intune.

SETTING	VALUE	DESCRIPTION
Path	./Vendor/MSFT/SurfaceHub/Properties/SurfaceHubMeetingMode	
Data Type	integer (0-2)	0 - Skype preferred app on the Start Screen, Teams Meetings available 1 - Teams preferred app on the Start Screen, Skype Meetings available 2 - Teams exclusive app on the Start screen (Skype app not available)
Operations	Get, Set	

SETTING	VALUE
Path	./Vendor/MSFT/SurfaceHub/Properties/VtcAppPackageId
Data Type	string - set string to Teams application package ID as **Microsoft.MicrosoftTeamsforSurfaceHub_8wekyb3d8bbwe!Teams**
Operations	Get, Set

Restart the Surface Hub device. After the device restarts, you should be able to start the Teams app from the Start screen and join a meeting from the calendar.

Teams update process

12/5/2020 • 2 minutes to read • Edit Online

The Teams web app is updated weekly.

Teams desktop client updates are released every two weeks after rigorous internal testing and validation through our Technology Adoption Program (TAP). This usually takes place on a Tuesday. If a critical update is required, Teams will bypass this schedule and release the update as soon as it's available.

The desktop client updates itself automatically. Teams checks for updates every few hours behind the scenes, downloads it, and then waits for the computer to be idle before silently installing the update.

Users can also manually download updates by clicking **Check for updates** on the **Profile** drop-down menu on the top right of the app. If an update is available, it will be downloaded and silently installed when the computer is idle.

Users need to be signed in for updates to be downloaded.

Starting July 31, 2019, Teams client updates use significantly lower network bandwidth during the update. This is turned on by default and requires no action from admins or users.

What about updates to Microsoft 365 Apps for enterprise?

Teams is installed by default with new installations of Microsoft 365 Apps for enterprise as described in Deploy Microsoft Teams with Microsoft 365 Apps for enterprise.

Teams follows its own update process as outlined above, and not the update process for the other Offices apps, such as Word and Excel. To learn more, read Overview of update channels for Microsoft 365 Apps for enterprise

What about updates to Teams on VDI?

Teams clients on Virtual Desktop Infrastructure (VDI) aren't automatically updated the way that non-VDI Teams clients are. You have to update the VM image by installing a new MSI as described in the instructions to Install Teams on VDI. You must uninstall the current version to update to a newer version.

Can admins deploy updates instead of Teams auto-updating?

Teams does not give admins the ability to deploy updates through any delivery mechanism.

Servicing agreement

As a modern online service, the Teams client auto-updates every two weeks. Because Teams is governed by the Modern Lifecycle Policy, it's expected that users remain on the most up-to-date version of the desktop client. This ensures that users have the latest capabilities, performance enhancements, security, and service reliability.

To begin assisting in identifying when desktop clients fall out of date, an in-app alert will be displayed if the user's current version is between one and three months old, and if there's a new version available. This in-app messaging encourages users to update to the latest version of Teams or, if necessary, to reach out to their IT admin to do so. Users on Teams desktop clients that are more than three months old will see a blocking page that gives the options to update now, reach out to their IT admin, or continue to Teams on the web.

Desktop client versions that are more than three months old upon first install and/or first run of Teams have a 28-day grace period before encountering the above-mentioned servicing information. During this period, the auto-

update process will update the Teams client. If not updated, users will see an in-app alert encouraging them to manually update to the latest version of Teams or, if necessary, to reach out to their IT admin to do so. This includes users using the Teams desktop client as part of the Microsoft 365 Apps for enterprise bundle.

Teams desktop clients on Government Clouds currently have an exception to this servicing agreement until further notice.

For information on new version releases, check Message Center or go to **Help** > **What's new** in the client.

Troubleshoot Microsoft Teams installation and update issues on Windows

8/28/2020 • 6 minutes to read • Edit Online

This article provides guidance for how to diagnose and troubleshoot installation and update issues for the Teams desktop client app running on Windows.

Check whether Teams is updated successfully

Follow these steps to check whether a Teams update is successfully installed.

1. In Teams, select your profile picture, and then click **About** > **Version**.
2. On the same menu, click **Check for updates**.
3. Wait for the banner at the top of the app to indicate that a "refresh" of Teams is needed. The link should be shown about a minute later as this process downloads the new version of Teams. The banner also lets you know if you're already running the latest version in which case, no update is necessary.
4. Click the refresh link in the banner.
5. Wait until Teams restarts, and then repeat step 1 to see whether the app is updated.

If you see a failure message or if the version number is the same as in step 4, the update process failed.

Troubleshoot installation and update issues

Troubleshoot installation issues

When Teams is installed, the Teams installer logs the sequence of events to %LocalAppData%\SquirrelTemp\SquirrelSetup.log. The first thing to look for is an error message or a call stack near the end of the log. Note that call stacks at the beginning of the log may not mean that an installation issue exists. It can be easier to compare your log against the log from a successful installation (even on another machine) to see what's expected.

If SquirrelSetup.log doesn't indicate the cause or if you need more information to troubleshoot the issue, see Collect and analyze application and system logs.

Troubleshoot update issues

When Teams is successfully installed, the log location switches from %LocalAppData%\SquirrelTemp to %LocalAppData%\Microsoft\Teams. At this location, there are two log files of interest, SquirrelSetup.log and logs.txt.

- The SquirrelSetup.log file at this location is written by Update.exe, which is an executable that services the Teams app.
- The Logs.txt file is used by the Teams app (specifically Teams.exe) to record significant application events. It will likely contain failure information.

These log files contain personally identifiable information (PII) and so they're not sent to Microsoft.

Teams can automatically start the update process (depending on the policy) or users can manually check for updates by going to their profile picture > **Check for updates**. Both methods use the following sequence of events.

1. **Check for updates**. Teams makes a web request and includes the current app version and deployment ring

information. The goal of this step is to get the download link. A failure at this step is logged in Logs.txt.

2. **Download update**. Teams downloads the update by using the download link obtained from step 1. When the download is complete, Teams calls Update.exe to stage the download. A download failure is also logged in Logs.txt.
3. **Stage the update**. The downloaded content is verified and unpacked into an intermediate folder, %LocalAppData%\Microsoft\Teams\stage), which is done by Update.exe. Failures at this step are logged in SquirrelTemp.log.
4. **Install the update**. There are multiple ways to start Teams. The system automatically starts Teams when a user logs in or you can start Teams through a shortcut. In this step, Update.exe checks for the presence of the staging folder, verifies the content again, and performs file operations to un-stage the app. The old application folder in %LocalAppData%\Microsoft\Teams\current is backed up to %LocalAppData%\Microsoft\Teams\previous and the stage folder is renamed to "current". Failures at this step are logged in SquirrelTemp.log.

If SquirrelTemp.log or Logs.txt don't contain sufficient information to determine the underlying cause and you need more information to troubleshoot the issue, go to Collect and analyze application and system logs.

Collect and analyze application and system logs

This section describes how to collect and analyze application and system logs to get more comprehensive information to troubleshoot the issue. You'll use Sysinternals tools to complete these steps. To learn more, see Windows Sysinternals.

Collect logs

1. Download the Sysinternals tools.
2. Extract the zip file to the %TEMP% folder on your local drive.
3. Open an elevated command prompt, and then do the following:

   a. Run the following to go to your TEMP folder:

   ```
   cd /d %TEMP%
   ```

   b. Copy the setup and application logs. Note that depending on the point of failure, some of these logs may not be present.

   ```
   copy %LocalAppData%\SquirrelTemp\SquirrelSetup.log SquirrelSetup.log
   copy %AppData%\Microsoft\Teams\logs.txt logs.txt
   copy %LocalAppData%\Microsoft\Teams\SquirrelSetup.log SquirrelSetup_Teams.log
   ```

   c. Run the following to capture the open handles.

   ```
   handle > handles.txt
   ```

   d. Run the following to capture the opened DLLs.

   ```
   listdlls -v Teams > dlls.txt
   ```

   e. Run the following to capture the drivers that are running.

   ```
   driverquery /v > driverquery.txt
   ```

f. Run the following to capture the access control lists (ACLs) of the Teams folder.

```
icacls %LOCALAPPDATA%\Microsoft\Teams /save icacls.txt /T
```

Analyze logs (for advanced users)

A failed update can result in unpredictable app behavior. For example, users may be unable to exit Teams, have a stale version of Teams, or can't start Teams. If you experience an issue during an update, the first place to look to find the cause is SquirrelTemp.log. Here are the different types of update failures, listed from most common to least common, and how to analyze and troubleshoot them using logs.

Unable to exit Teams

As Teams determines that it needs to update itself to a newer version, it downloads and stages the new app, and then waits for an opportunity to restart itself the next time the machine is idle. A common issue during this process is when another process or a file system driver locks up the Teams.exe process, which prevents Teams.exe from exiting. As a result, the Teams app can't be replaced by the newly-downloaded and staged app.

Troubleshooting tips:

- To confirm that is the issue that you're experiencing, quit Teams (right-click Teams on the task bar, and then click **Quit**). Then, open Task Manager in Windows to see whether an instance of Teams is still running.
- If you're not on the computer that's having this issue, inspect the SquirrelTemp.log collected from the computer that's experiencing this issue and look for a "Program: Unable to terminate the process in the log" entry.
- To determine what's preventing Teams.exe from exiting, look at the Dlls.txt and Handles.txt logs. These tell you the processes that prevented Teams from exiting.
- Another culprit that can prevent Teams from exiting is the kernel-mode file system filter driver. Use the SysInternals tool, ProcDump, to collect the kernel-mode process dump by running `procdump -mk <pid>`, where is the process ID obtained from Task Manager. You can also inspect the Driverquery.txt log file to see the active filter drivers that may interfere with Teams.
- To recover from this state, restart the computer.

File permissions

Teams creates a number of subfolders and files in the user's profile throughout the installation and update process. Because the app and the updater runs as a non-elevated user, read and write permissions must be granted on the following folders:

FOLDER	USED BY
%LocalAppData%\SquirrelTemp	Teams installer (for example, Teams_Windows_x64.exe) during installation phase
%LocalAppData%\Microsoft\Teams	Teams updater (Update.exe) to extract and stage the app package during update process
%AppData%\Microsoft\Teams	Teams app (Teams.exe) to save settings, app states, and the (pre-staged) downloaded update package

If Teams is denied access because it can't write to a file, another software application may be interfering or a security descriptor entry may be limiting write access to a folder.

Troubleshooting tips:

- Look for "access denied" evidence in SquirrelTemp.log or Logs.txt. Check these files to see whether there was an attempt to write to a file that failed.
- Open Icacls.txt and look for the effective access control entry (ACE) that blocks write operations by a user who

is not an admin. Typically, this is in one of the DACL entries. For more information, see the icacls documentation.

File corrupted

In some cases, encryption software can change files in the %LocalAppData%\Microsoft\Teams folder, which can prevent Teams from starting. This can happen at any time, even when the app isn't being updated. Unfortunately, when a file is corrupted, the only way to recover from this state is to uninstall and re-install Teams.

> **NOTE**
>
> If you can't determine the underlying cause of the issue by using any of these steps, you may want to try a Process Monitor session. Process Monitor is a Sysinternals tool that records access to the registry and file system.

Related topics

- Get clients for Teams
- Teams client updates
- Teams Troubleshooting

Manage user access to Teams

11/2/2020 • 4 minutes to read • Edit Online

You manage access to Teams at the user level by assigning or removing a Microsoft Teams product license. Each user in your organization must have a Teams license before they can use Teams. You can assign a Teams license for new users when new user accounts are created or to users with existing accounts.

By default, when a licensing plan (for example, Microsoft 365 Enterprise E3 or Microsoft 365 Business Premium) is assigned to a user, a Teams license is automatically assigned, and the user is enabled for Teams. You can disable or enable Teams for a user by removing or assigning a license at any time.

Use messaging policies, managed from the Teams Admin Center, to control what chat and channel messaging features are available to users in Teams. You can use the default policy or create one or more custom messaging policies for people in your organization. To learn more, read Manage messaging policies in Teams. You manage Teams licenses in the Microsoft 365 admin center or by using PowerShell. You must be a Global admin or User management admin to manage licenses.

> **NOTE**
>
> We recommend that you enable Teams for all users so that teams can be formed organically for projects and other dynamic initiatives. Even if you're running a pilot, it may still be helpful to keep Teams enabled for all users, but only target communications to the pilot group of users.

Using the Microsoft 365 admin center

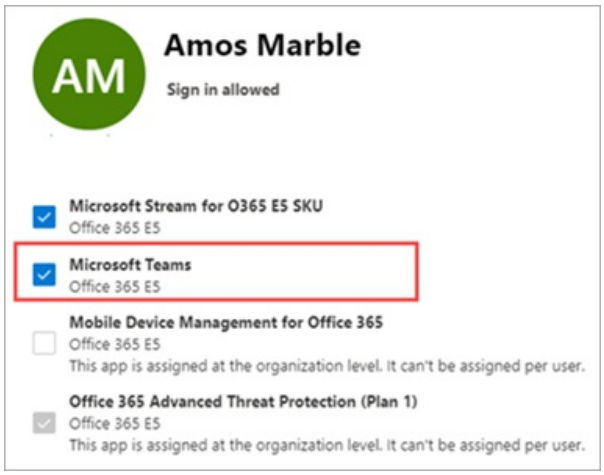
Teams user-level licenses are managed directly through the Microsoft 365 admin center user management interfaces. An administrator can assign licenses to new users when new user accounts are created, or to users with existing accounts.

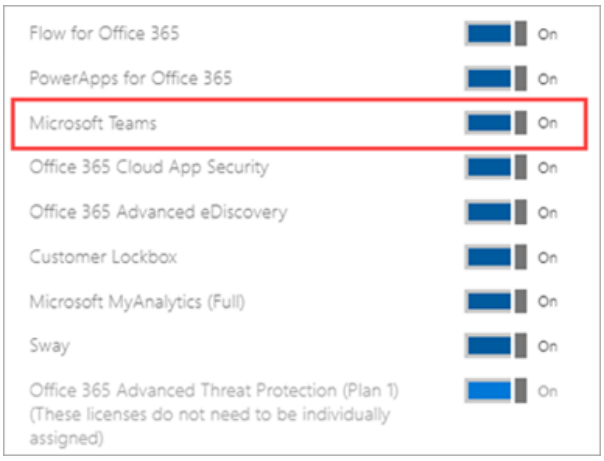
> **IMPORTANT**
>
> The administrator must have Global Administrator or User Management Administrator privileges to manage Microsoft Teams licenses. Use the Microsoft 365 admin center to manage Teams licenses for individual users or small sets of users at a time. You can manage Teams licenses on the **Licenses** page (for up to 20 users at at time) or **Active users** page. The method you choose depends on whether you want to manage product licenses for specific users or manage user licenses for specific products.

If you need to manage Teams licenses for a large number of users, such as hundreds or thousands of users, use Powershell or group-based licensing in Azure Active Directory (Azure AD).

Assign a Teams license

The steps are different depending on whether you use the **Licenses** page or **Active users** page. For step-by-step instructions, see Assign licenses to users.

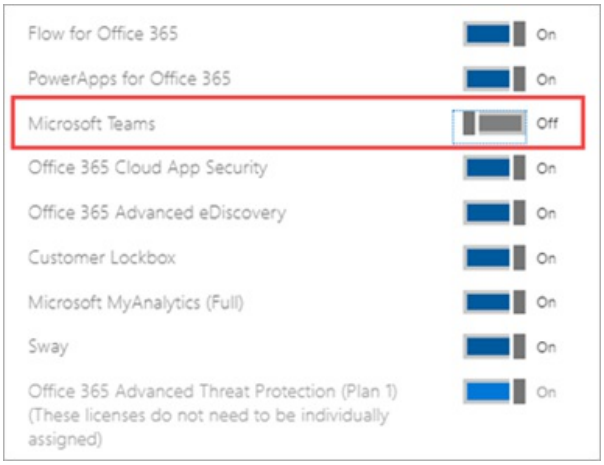




Remove a Teams license

When you remove a Teams license from a user, Teams is disabled for that user, and they will no longer see Teams in the app launcher or homepage. For detailed steps, see Unassign licenses from users.





Using PowerShell

Use PowerShell to manage Teams licenses for users in bulk. You enable and disable Teams through PowerShell in the same way that you would for any other service plan license. You'll need the identifiers for the service plans for Teams, which are as follows:

- Microsoft Teams: TEAMS1
- Microsoft Teams for GCC: TEAMS_GOV
- Microsoft Teams for DoD: TEAMS_DOD

Assign Teams licenses in bulk

For detailed steps, see Assign licenses to user accounts with PowerShell.

Remove Teams licenses in bulk

For detailed steps, see Disable access to services with PowerShell and Disable access to services while assigning user licenses.

Example

The following is an example of how to use the New-MsolLicenseOptions and Set-MsolUserLicense cmdlets to disable Teams for users who have a specific licensing plan. For example, follow these steps to first disable Teams

for all users who have a particular licensing plan. Then enable Teams for each individual user who should have access to Teams.

> **IMPORTANT**
> The New-MsolLicenseOptions cmdlet will enable all services that were previously disabled unless explicitly identified in your custom script. For example, if you want to leave both Exchange and Sway disabled while also disabling Teams, you'll need to include this in the script or both Exchange and Sway will be enabled for those users you identified.

Run the following command to display all available licensing plans in your organization. To learn more, see View licenses and services with PowerShell.

```
Get-MsolAccountSku
```

Run the following commands, where <CompanyName:License> is your organization name and the identifier for the licensing plan that you retrieved in the earlier step. For example, ContosoSchool:ENTERPRISEPACK_STUDENT.

```
$acctSKU="<CompanyName:License>
$x = New-MsolLicenseOptions -AccountSkuId $acctSKU -DisabledPlans "TEAMS1"
```

Run the following command to disable Teams for all users who have an active license for the licensing plan.

```
  Get-MsolUser | Where-Object {$_.licenses[0].AccountSku.SkuPartNumber -eq
($acctSKU).Substring($acctSKU.IndexOf(":")+1,  $acctSKU.Length-$acctSKU.IndexOf(":")-1) -and $_.IsLicensed -
eq $True} |  Set-MsolUserLicense -LicenseOptions $x
```

Manage teams at the organization level

Tenant-level control for Teams was removed effective August 2018. Control access to Teams in your organization with user-level licensing. To learn more, see Manage user access to Teams.

The exception to this change is Microsoft Teams for Education (EDU). You can still manage Teams at the organization level if you have an EDU license. To do this, go to the Microsoft 365 admin center > **Settings** > **Services and add-ins** > **Microsoft Teams**. If you're using the new Teams admin center, you'll have to turn off **Try the new admin center** to find **Services and add-ins**.

> **IMPORTANT**
> You may have to wait up to 24 hours for your changes to take effect.

Related topics

- Teams add-on licenses
- Assign Teams add-on licenses
- View licenses and services with PowerShell
- Product names and service plan identifiers for licensing
- Education SKU reference

Microsoft Teams add-on licenses

9/30/2020 • 8 minutes to read • Edit Online

What are add-on licenses?

Add-on licenses are licenses for specific Microsoft Teams features. They give you the flexibility to add features only for users in your organization who need them. To add a feature, buy one add-on license for each user who will use it.

What features can I get with add-on licenses?

Here's a list of features that you can add with Teams add-on licenses. The add-on licensing options available to you depend on the Microsoft 365 or Office 365 plan you have.

Feature	Description	Small business (<300 users)	Large business (>300 users)
Microsoft 365 Business Voice	Business Voice is a telephony solution designed for small and medium businesses of up to 300 users that bundles Phone System, Audio Conferencing, a Domestic Calling Plan, and more. Phone System capabilities that you'll get include voicemail, caller ID, call park, call forwarding, auto attendants, and call queues. To find out whether Business Voice is available in your country or region, see Country and region availability for Business Voice. For pricing info, see Pricing for Business Voice.	✓	

Audio Conferencing	Sometimes people in your organization will need to use a phone to call in to a Teams meeting instead their computer. Set up Audio Conferencing for users who schedule or leads meetings. To find out whether Audio Conferencing is available in your country or region, see Country and region availability for Audio Conferencing and Calling Plans. For pricing info, see Pricing for Audio Conferencing. If you're a small or medium-sized business with up to 300 users and you currently don't have Audio Conferencing licenses, you can get Audio Conferencing free for one year. Starting October 1, 2020, the free Audio Conferencing offer is available to users who have Microsoft 365 Business Basic, Business Standard, Business Premium, Enterprise E1, or Enterprise E3 licenses. To learn more, see Set up Audio Conferencing for small and medium businesses.	✓	✓
Toll free numbers	If you want toll-free numbers for Audio Conferencing, auto attendants, or call queues, you must set up Communications Credits.	✓	✓
Phone System	Phone System is a hosted telephone service that gives you call control and Private Branch Exchange (PBX) capabilities, with options for connecting to the Public Switched Telephone Network (PSTN). Phone System features include cloud voicemail, caller ID, call park, call forwarding, auto attendants, call queues, call transfer, caller ID, and more. To learn more, see Here's what you get with Phone System. For pricing info, see Pricing for Phone System.	✓[1]	✓

Calling Plans	If you want users to be able to call phone numbers outside your organization, get a Calling Plan. There are Domestic Calling Plans and Domestic and International Calling Plans. For pricing info, see Pricing for Calling Plans.	✓[1]	✓
Microsoft Teams Rooms	Microsoft Teams Rooms isn't an add-on, but a feature that brings video, audio, and content sharing to conference rooms. See Teams Meeting Room Licensing.	✓	✓
Advanced Communications	Advanced Communications includes enhanced calling and meeting capabilities such as large meetings, meetings customization, communications integrations, and advanced tools for communications management. Reach larger audiences with live events for up to 20,000 participants and interactive meetings for 1,000 participants. Additional features include custom branded meeting lobby to tailor your meetings, the ability to integrate meetings and calling to workflows, and tools to monitor, track, and analyze data on users and devices.	✓	✓

[1] If you're a small or medium-sized business who has a Microsoft 365 Enterprise plan, you can still buy add-on licenses for these voice features, however, we recommend that you consider a Microsoft 365 Business plan and Business Voice.

What voice features are available with my plan?

See what add-on licenses you need to get voice features in Teams, depending on the plan you have.

Depending on the voice features that you want, we recommend comparing whether it's more cost effective for you to switch to a plan that includes those features. For example, for most large organizations, buying a bundle of software in a Microsoft 365 Enterprise plan will result in lower overall cost. Typically, when you buy several add-on licenses individually instead of as part of a plan, you may end up with a higher combined cost.

- **Small business**
- **Enterprise**
- **Education**
- **Government**

- Nonprofit
- Trial offers

If you're a small or medium-sized business (less than 300 users), you have four ways to get voice features:

- Buy a Microsoft 365 Business plan and Microsoft 365 Business Voice.
- Buy an Enterprise E1 or E3 plan and Microsoft 365 Business Voice.
- Buy an Enterprise E1 or E3 plan and add voice features individually.
- Buy an Enterprise E5 plan, which includes voice features.

For Microsoft 365 Business Voice, you have two options to choose from:

- **Microsoft 365 Business Voice with a Calling Plan**: Get this if you want all phone number management and billing to be handled by Microsoft.
- **Microsoft 365 Business Voice without a Calling Plan (Direct Routing)**: Get this if you want all phone number management and billing to be handled by your third-party telephone provider. You'll need to set up and deploy Direct Routing to connect your on-premises Session Border Controllers (SBCs) to Microsoft 365 or Office 365.

To learn more, see What do I need to buy to use Microsoft 365 Business Voice?.

Here's a summary, based on licensing plan.

Small business (<300 people)					
Base plan	Voice calling and conferencing options				
Microsoft 365 Business Basic Microsoft 365 Business Standard Microsoft 365 Business Premium	Microsoft 365 Business Voice International Calling Plan (optional) Communications Credits	Or	Microsoft 365 Business Voice without Calling Plan Audio Conferencing Communication Credits	Or	Audio Conferencing Communication Credits
Microsoft 365 Enterprise E1/E3 Office 365 Enterprise E1/E3 Microsoft 365 F3 Office 365 F3	Microsoft 365 Business Voice International Calling Plan (optional) Communications Credits	Or	Microsoft 365 Business Voice without Calling Plan	Or	Audio Conferencing Phone System Domestic Calling Plan Domestic and International Calling Plan (optional) Communications Credits
Microsoft 365 Enterprise E5 Office 365 Enterprise E5	Domestic Calling Plan Domestic and International Calling Plan (optional) Communications Credits				

If Audio Conferencing isn't supported in your country or region, you have the option to get a Microsoft 365 Enterprise E5 without Audio Conferencing plan or an Office 365 Enterprise E5 without Audio Conferencing plan.

If you already have a Microsoft 365 Enterprise or Office 365 Enterprise plan, you can still buy add-on licenses for individual voice features. However, you have the option to switch to a Microsoft 365 Business plan and Microsoft 365 Business Voice. In some cases, depending on the features that you want, it might be more cost effective to get a Microsoft 365 Business plan with Microsoft 365 Business Voice.

> **NOTE**
>
> If you need to use a third-party telephone service, Direct Routing is deployed in your organization, or if Calling Plans aren't available in your country or region, you need to use Direct Routing for voice features.

Need help?

Need to talk to someone about the add-on options? Contact support for business products - Admin Help.

Related topics

- Assign Teams add-on licenses
- Manage user access to Teams
- Teams service description

Assign Teams add-on licenses to users

8/17/2020 • 5 minutes to read • Edit Online

Add-on licenses are licenses for specific Teams features such as Audio Conferencing, Phone System, and Calling Plans. This article describes how to assign add-on licenses to individual users and to large sets of users in bulk.

> **NOTE**
>
> See Teams add-on licensing for Teams features that are available with add-on licenses. You'll also find information about what licenses you need to buy and how to buy them (depending on your plan), so users can get features such as Audio Conferencing, toll-free numbers, and the ability to call phone numbers outside your organization. After you decide which features you want for your users, assign the licenses to them.

You can use the Microsoft 365 admin center or PowerShell to assign licenses to users in your organization. You must be a Global admin or User management admin to manage licenses.

What you need to know before you assign Phone System, Calling Plan, and Communication Credits licenses

Before you get started, review the following:

- If you're using on-premises Public Switched Telephone Network (PSTN) connectivity for hybrid users, you only need to assign a Phone System license. Do NOT assign a Calling Plan license.
- Because of the latency between Microsoft 365 and Microsoft Teams, it can take up to 24 hours for a user to be assigned a Calling Plan after you assign a license. If the user isn't assigned a Calling Plan after 24 hours, contact support for business products - admin help.
- You'll get an error message if you haven't purchased the correct number of licenses. If you need to buy more Calling Plan licenses, choose the option to buy more.
- Even if your users are assigned Enterprise E5 licenses, you still need to assign Communications Credits licenses to them if they want make or receive calls from the PSTN.
- After you assign Calling Plan or Communication Credits licenses to your users, you'll need to get phone numbers for your organization, and then assign those numbers to users. For step-by-step instructions, see Set up Calling Plans.

Using the Microsoft 365 admin center

Use the Microsoft 365 admin center to assign licenses to individual users or small sets of users at a time. You can assign licenses on the **Licenses** page (for up to 20 users at a time) or the **Active users** page. The method you choose depends on whether you want to manage product licenses for specific users or manage user licenses for specific products.

For step-by-step instructions, see Assign licenses to users.

If you need to assign licenses for a large number of users, such as hundreds or thousands of users, use Powershell or group-based licensing in Azure Active Directory (Azure AD).

Using PowerShell

Use PowerShell to assign licenses to users in bulk. To learn more, see Assign licenses to user accounts with PowerShell.

Example script

Here's an example of how to use a script to assign licenses to your users.

1. Install the 64-bit version of the Microsoft Online Services Sign-in Assistant for IT Professionals RTW.
2. Install the Microsoft Azure Active Directory Module for Windows PowerShell:
   a. Open an elevated Windows PowerShell command prompt (run Windows PowerShell as an admin).
   b. Run the following command:

   ```
   Install-Module MSOnline
   ```

   c. If you're prompted to install the NuGet provider, type **Y**, and then press Enter.
   d. If you're prompted to install the module from PSGallery, type **Y**, and then press Enter.
3. At the Windows PowerShell command prompt, run the following script to assign licenses to your users, where <CompanyName:License> is your organization name and the identifier for the license that you want to assign. For example, litwareinc:MCOMEETADV.

   The identifier is different than the friendly name of the license. For example, the identifier for Audio Conferencing is MCOMEETADV. To learn more, see Product names and SKU identifiers for licensing.

   ```
   #Create a text file with a single column that lists the user principal names (UPNs) of users to assign
   licenses to. The MSOL service uses the UPN to license user accounts.
   #Example of text file:''
   #user1@domain.com
   #user2@domain.com

   #Import Module
   ipmo MSOnline

   #Authenticate to MSOLservice
   Connect-MSOLService
   #File prompt to select the userlist txt file
   [System.Reflection.Assembly]::LoadWithPartialName("System.windows.forms") | Out-Null
     $OFD = New-Object System.Windows.Forms.OpenFileDialog
     $OFD.filter = "text files (*.*)| *.txt"
     $OFD.ShowDialog() | Out-Null
     $OFD.filename

   If ($OFD.filename -eq '')
   {
   Write-Host "You did not choose a file. Try again" -ForegroundColor White -BackgroundColor Red
   }

   #Create a variable of all users
   $users = Get-Content $OFD.filename

   #License each user in the $users variable
   foreach ($user in $users)
       {
       Write-host "Assigning License: $user"
       Set-MsolUserLicense -UserPrincipalName $user -AddLicenses "litwareinc:<CompanyName:License>" -
   ErrorAction SilentlyContinue
       Set-MsolUserLicense -UserPrincipalName $user -AddLicenses "litwareinc:<CompanyName:License>" -
   ErrorAction SilentlyContinue
       }
   ```

   For example, to assign Microsoft 365 Enterprise 1 and Audio Conferencing licenses, use the following

syntax in the script:

```
Set-MsolUserLicense -UserPrincipalName $user -AddLicenses "litwareinc:ENTERPRISEPACK" -ErrorAction
SilentlyContinue
Set-MsolUserLicense -UserPrincipalName $user -AddLicenses "litwareinc:MCOMEETADV" -ErrorAction
SilentlyContinue
```

To assign a Microsoft Business Voice (without Calling Plan) license, use the following syntax in the script:

```
Set-MsolUserLicense -UserPrincipalName $user -AddLicenses "litwareinc:BUSINESS_VOICE_DIRECTROUTING" -
ErrorAction SilentlyContinue
```

Product names and SKU identifiers for licensing

Here's a partial list of product names and their corresponding SKU part names that you can use as a reference when you use PowerShell to manage licenses in Teams.

To learn more, see View licenses and services with PowerShell, Product names and service plan identifiers for licensing, and Education SKU reference.

PRODUCT NAME	SKU PART NAME
Microsoft Enterprise E5 (with Phone System)	ENTERPRISEPREMIUM
Microsoft Enterprise E5 (without Audio Conferencing)	ENTERPRISEPREMIUM_NOPSTNCONF
Microsoft Enterprise E5 (with Audio Conferencing)	ENTERPRISEPREMIUM
Microsoft Enterprise E3	ENTERPRISEPACK
Microsoft Enterprise E1	STANDARDPACK
Microsoft 365 Business Basic	O365_BUSINESS_ESSENTIALS
Microsoft 365 Business Standard	O365_BUSINESS_PREMIUM
Microsoft 365 Business	SPB
Microsoft Business Voice (Canada)	BUSINESS_VOICE_MED
Microsoft Business Voice (United Kingdom)	BUSINESS_VOICE
Microsoft Business Voice (United States)	BUSINESS_VOICE_MED2
Microsoft Business Voice (without Calling Plan)	BUSINESS_VOICE_DIRECTROUTING
Microsoft Business Voice (without Calling Plan) for the United States	BUSINESS_VOICE_DIRECTROUTING _MED
Audio Conferencing	MCOMEETADV
Audio Conferencing Pay Per Minute (pay as you go) *Requires Communications Credits to be set up and enabled.*	MCOMEETACPEA

PRODUCT NAME	SKU PART NAME
Phone System	MCOEV
Domestic and International Calling Plan	MCOPSTN2
Domestic Calling Plan (3000 minutes per user/month for US/PR/CA, 1200 minutes per user/month for EU countries)	MCOPSTN1
Domestic Calling Plan (120 minutes per user/month for each country) *This plan isn't available in the United States.*	MCOPSTN5
Domestic Calling Plan (240 minutes per user/month for each country) *This plan isn't available in the United States.*	MCOPSTN6
Communications Credits	MCOPSTNPP

Related topics

- Teams add-on licensing
- Manage user access to Teams
- View licenses and services with PowerShell
- Product names and service plan identifiers for licensing
- Education SKU reference

Manage the Office 365 E1 Trial

8/6/2020 • 2 minutes to read • Edit Online

As of July 1, 2020, the Office 365 E1 Trial license is no longer available. If you need to license users for Microsoft Teams, read the Microsoft Teams service description for a list of paid subscriptions that include Teams. Alternatively, eligible organizations can use the **Free version of Teams**, or employees can activate the **Teams Exploratory** experience.

If you're a Teams for Education customer, check out the free Office 365 A1 license.

Use the guidance in this article to manage your existing Office 365 E1 Trial licenses, including upgrading to a paid subscription.

Don't miss all of our guidance for supporting remote workers with Teams.

Manage the E1 Trial

Once you've activated the Office 365 E1 Trial, turn on the license for any uses who need it. To learn how, read Manage user access to Teams.

Once you've turned on the E1 Trial for the users who need it, you'll manage these users just like you manage users who have a paid license. For more information, see Manage Teams settings for your organization.

Upgrade users from the Office 365 E1 Trial license

To upgrade E1 Trial users to a paid subscription:

1. Purchase a subscription that includes Teams.
2. Remove the Office 365 E1 Trial subscription from the user.
3. Assign the newly purchased license.

For more information, see Microsoft Teams service description.

> **NOTE**
> If the E1 Trial license ends and a user is not immediately upgraded to a subscription that includes Teams, the user data is not removed. The user still exists in Azure Active Directory and all data within Teams still remains. Once a new license is assigned to the user to enable Teams functionality again, all content will still exist.

Remove an Office 365 E1 Trial license

- If you would like to remove this license by using PowerShell, see: Remove licenses from user accounts with Office 365 PowerShell
- If you would like to remove this license through the admin portal, see: Delete a user from your organization

Related topics

Manage user access to Teams

Manage Teams settings for your organization

Manage the Teams Exploratory experience

Microsoft 365 or Office 365 Nonprofit

Get assistance deploying Teams

Manage the Office 365 G1 Trial for US government

8/6/2020 • 2 minutes to read • Edit Online

As of July 1, 2020, the Office 365 E1 Trial license is no longer available. If you need to license users for Microsoft Teams, read the Microsoft Teams service description for a list of paid subscriptions that include Teams.

Use the guidance in this article to manage your existing Office 365 G1 Trial licenses, including upgrading to a paid subscription. To learn more, read Microsoft 365 Government Plans and the Microsoft Teams capabilities available in the GCC Cloud.

Don't miss all of our guidance for supporting remote workers with Teams.

Manage the G1 Trial

Once you've activated the Office 365 G1 Trial, turn on the license for any uses who need it. To learn how, read Manage user access to Teams.

Once you've turned on the G1 Trial for the users who need it, you'll manage these users just like you manage users who have a paid license. For more information, see Manage Teams settings for your organization.

Upgrade users from the Office 365 G1 Trial license

To upgrade G1 Trial users to a paid subscription:

1. Purchase a subscription that includes Teams.
2. Remove the Office 365 G1 Trial subscription from the user.
3. Assign the newly purchased license.

For more information, see Teams for Government.

> **NOTE**
> If the G1 Trial license ends and a user is not immediately upgraded to a subscription that includes Teams, the user data is not removed. The user still exists in Azure Active Directory and all data within Teams still remains. Once a new license is assigned to the user to enable Teams functionality again, all content will still exist.

Remove an Office 365 G1 Trial license

- If you would like to remove this license by using PowerShell, see: Remove licenses from user accounts with Office 365 PowerShell
- If you would like to remove this license through the admin portal, see: Delete a user from your organization

Related topics

Manage user access to Teams

Manage Teams settings for your organization

Manage the Microsoft Teams Exploratory license

12/5/2020 • 6 minutes to read • Edit Online

The Microsoft Teams Exploratory experience lets users in your organization who have Azure Active Directory (Azure AD) and aren't licensed for Teams initiate an exploratory experience of Teams. Admins can switch this feature on or off for users in their organization. The earlier Microsoft Commercial Cloud Trial is now replaced by The Teams Exploratory experience.

What's in the Teams Exploratory experience

The service plans that an admin will see as part of the Teams Exploratory experience are:

- Exchange Online (Plan 1)
- Flow for Microsoft 365 or Office 365
- Insights by MyAnalytics
- Microsoft Forms (Plan E1)
- Microsoft Planner
- Microsoft Search
- Microsoft StaffHub
- Microsoft Stream for Microsoft 365 and Office 365 E1 SKUs [1</1>]
- Microsoft Teams
- Mobile Device Management for Microsoft 365 or Office 365
- Office Mobile Apps for Office 365
- Office Online
- PowerApps for Microsoft 365 or Office 365
- SharePoint Online (Plan 1)
- Sway
- To-Do (Plan 1)
- Whiteboard (Plan 1)
- Yammer Enterprise

[1] The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt in to this experience. In November, you'll have to opt out if you want to continue using Stream. Sometime in early 2021, we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

Who's eligible

Users fit the criteria for a Teams Exploratory experience if they:

- Have a managed Azure AD domain email address.

- Belong to a tenant with a paid subscription.

Users must be enabled to sign up for apps and trials (in the Microsoft 365 admin center). For more information, see Manage the Teams Exploratory experience, later in this article.

Who isn't eligible

Users don't fit the criteria if they:

- Currently or previously had Teams from a paid, unpaid or trial license
- Are in a tenant that used/received at least one special COVID offer.

Your organization isn't eligible for this offer if you're a Syndication Partner Customer or a GCC, GCC High, DoD, or EDU customer.

How users sign up for the Teams Exploratory experience

Eligible users can sign up for the Teams Exploratory experience by signing in to Teams (teams.microsoft.com). They'll be assigned this license automatically and the tenant admin will receive an email notification the first time someone in your org starts the Teams Exploratory experience.

Manage the Teams Exploratory experience

The Teams Exploratory experience is meant to be initiated by individual end users, and you can't initiate this offer on behalf of end-user employees.

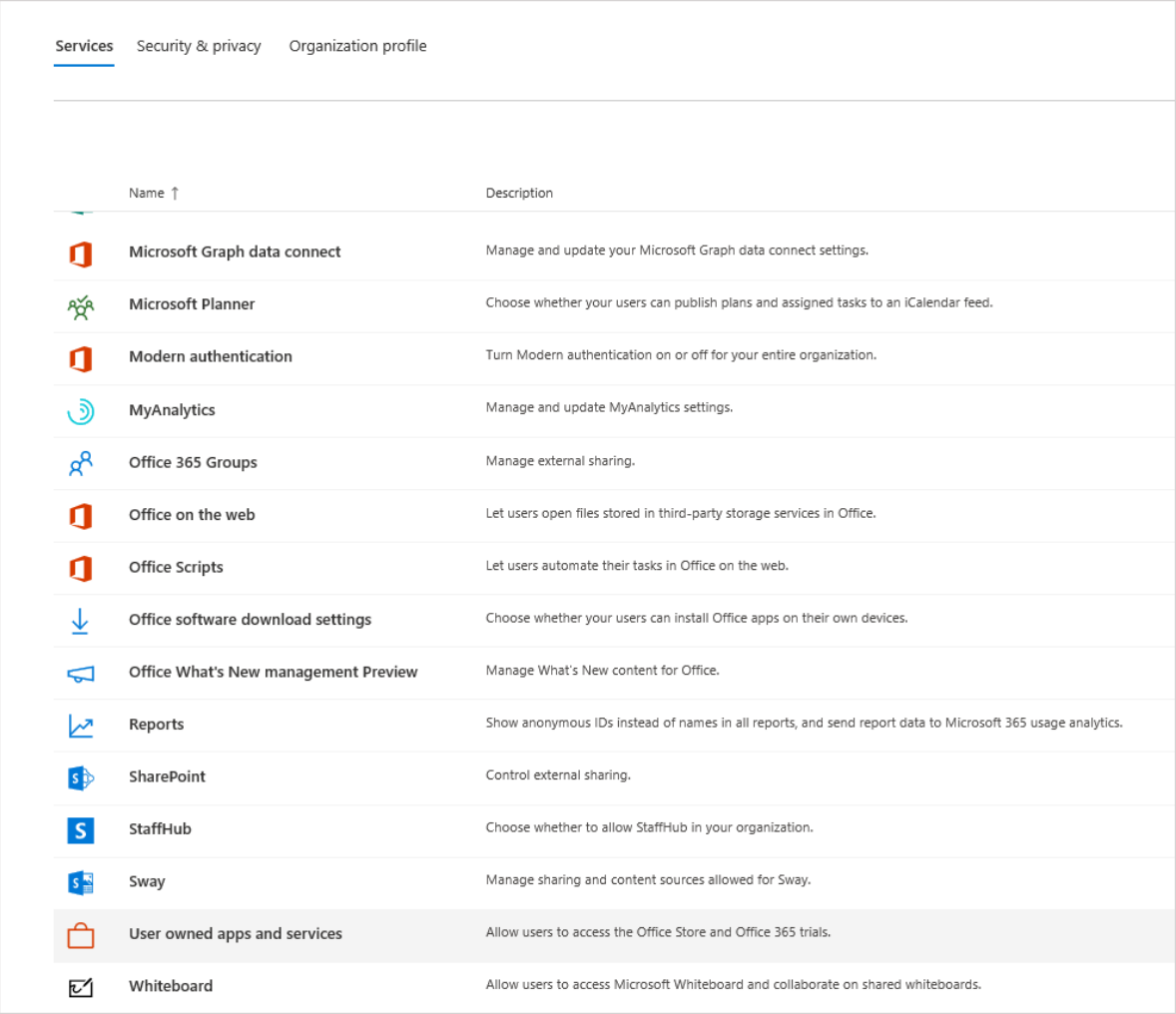
The Teams Exploratory experience comes with an Exchange Online license, but it won't be assigned to the user until the admin assigns it. If the user doesn't have an Exchange license already, and the admin has yet to assign the Exchange Online license, the user won't be able to schedule meetings in Teams and might be missing other Teams functionality.

Admins can disable the ability for end users to run the Teams Exploratory experience within their organization by using the **Trial apps and services** switch.

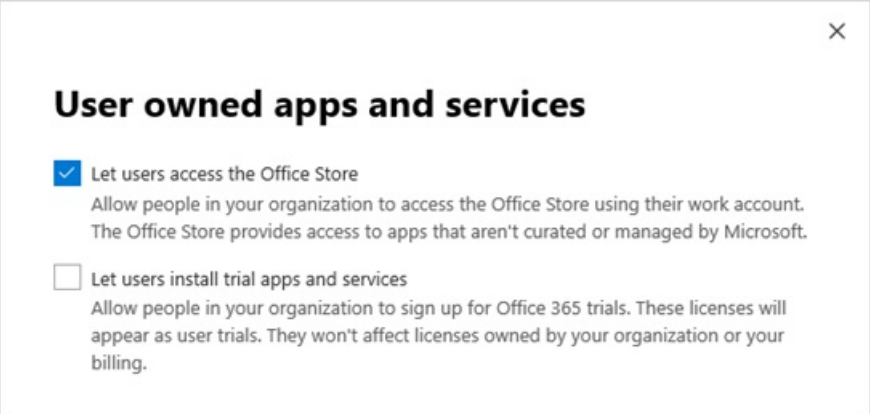
Prevent users from installing trial apps and services

You can turn off a user's ability to install trial apps and services, which would prevent the user from running the Teams Exploratory experience.

1. From the Microsoft 365 admin center, go to **Settings** > **Org settings**, select **Services**, and then select **User owned apps and services**.



2. Clear the **Let users install trial apps and services** check box.



> **NOTE**
>
> If your organization is ineligible for the Teams Exploratory experience, you won't see the **Let users install trial apps and services** option.

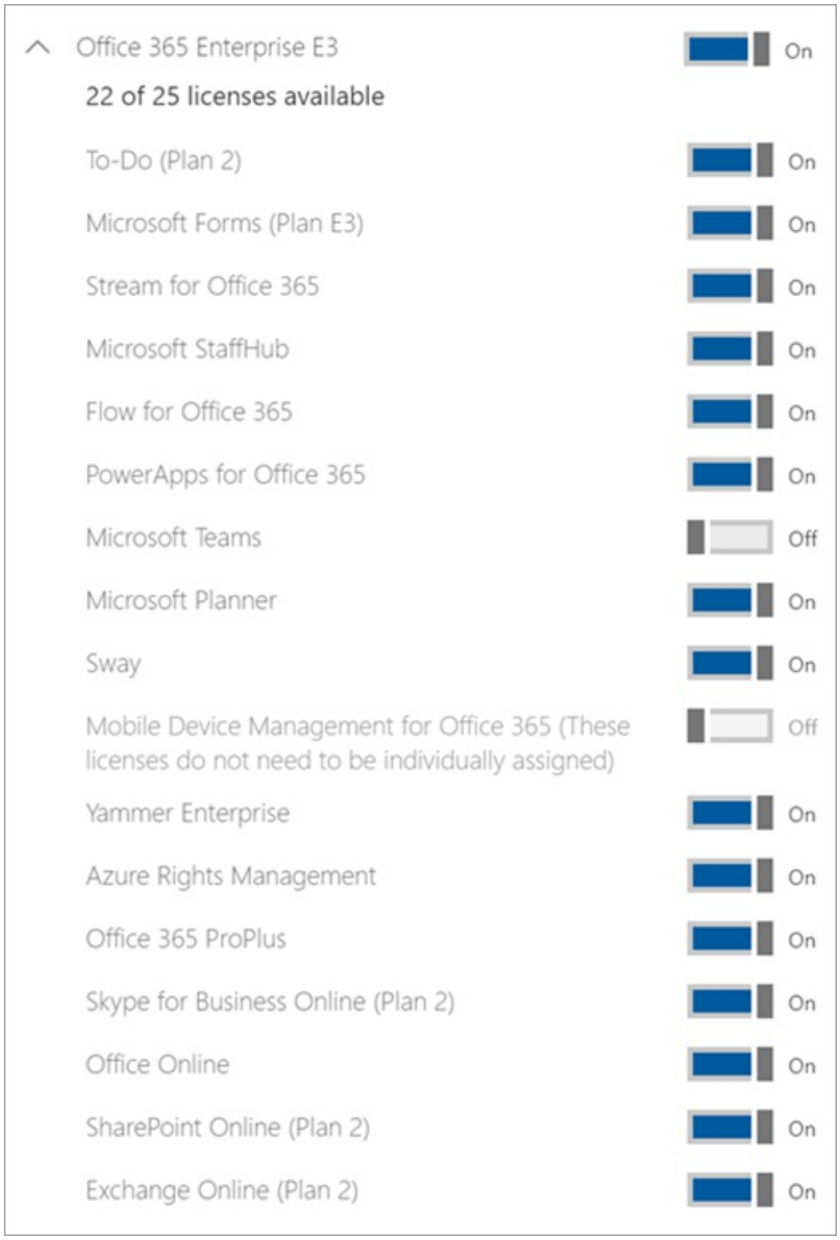
Manage availability for a user with a license that includes Teams

A user who is assigned a license that includes Teams isn't eligible for the Teams Exploratory experience. When the Teams service plan is turned on, the user can sign in and use Teams. If the service plan is disabled, the user can't sign in and the Teams Exploratory experience isn't available. You must have admin privileges.

To turn off access to Teams:

1. In the Microsoft 365 admin center, select **Users** > **Active users**.

2. Select the box next to the name of the user.
3. In the **Product licenses** row, choose **Edit**.
4. In the **Product licenses** pane, switch the toggle to **Off**.



Manage Teams availability for users who are already using the Teams Exploratory experience

If a user is running the Teams Exploratory experience, you can turn it off by removing the license or service plan. You must have admin privileges.

To turn off the Teams Exploratory experience license:

1. In the Microsoft 365 admin center, select **Users** > **Active users**.
2. Select the box next to the name of the user.
3. In the **Product licenses** row, choose **Edit**.
4. In the **Product licenses** pane, switch the toggle for this exploratory license to **Off**.

> **NOTE**
> The Teams Exploratory toggle switch will appear after the first user in the organization launches the Teams Exploratory experience.

Manage Teams for users who have the Teams Exploratory license

You can manage users who have the Teams Exploratory license just like you manage users who have a regular paid license. For more information, see Manage Teams settings for your organization.

Upgrade users from the Teams Exploratory license

To upgrade users from the Teams Exploratory license (you must have admin privileges), do the following tasks:

1. Purchase a subscription that includes Teams.
2. Remove the Teams Exploratory subscription from the user.
3. Assign the newly purchased license.

For more information, see Microsoft Teams service description.

> **NOTE**
> If the Teams Exploratory license ends and a user isn't immediately upgraded to a subscription that includes Teams, they have 30 days of grace period and then another 30 days after which time the data is going to be deleted. The user still exists in Azure Active Directory. Once a new license is assigned to the user to enable Teams functionality again, all content will still exist if the user is added within the grace period time frame.

What happens to legacy Microsoft Teams Commercial Cloud Trial licenses

As of February 2020, eligible users can begin using the latest Microsoft Teams Exploratory experience. All legacy Teams Commercial Cloud Trial licenses will be automatically converted to the new offer before their trial expires.

When users sign in to their expired Teams Commercial Cloud Trial for the first time, we automatically assign a Teams Exploratory experience license to those users. Users aren't converted until they sign in.

Remove a Teams Exploratory license

- If you would like to remove this license by using PowerShell, see: Remove licenses from user accounts with Office 365 PowerShell
- If you would like to remove this license through the admin portal, see: Delete a user from your organization

What is the data retention policy

See Microsoft 365 subscription information.

How long does the Teams Exploratory experience last

The Microsoft Teams Exploratory experience is available at no additional cost until your next **agreement anniversary** or **renewal** on or after January 2021. At that time, end users on a Microsoft Exploratory experience license will need to move to a paid license that includes Teams. Any Microsoft Exploratory experience licenses initiated after that will remain available at no additional cost until your next **anniversary** or **renewal** cycle.

What happens if an end user initiates the Microsoft Teams Exploratory experience just before the anniversary

or renewal date

Microsoft Teams Exploratory experience licenses initiated within 90 days of your **agreement anniversary** or **renewal** won't be required to move to a paid license until the subsequent anniversary or renewal cycle.

What if my agreement doesn't have an anniversary or yearly renewal date (for example, month-to-month agreements)

For agreements without an anniversary or yearly renewal date, the subsequent year after the first end-user activates the Microsoft Teams Exploratory experience licenses will be treated as the anniversary or renewal date. Users on the Microsoft Teams Exploratory license must be converted to a paid license by that date each year, according to the policies outlined in this article.

For example, if the first end user activates Microsoft Teams Exploratory on June 19, 2020, then they and all other eligible users in the customer tenant must convert to a paid license with Teams by June 19, 2021.

> **NOTE**
>
> Customers will be disabled and blocked from starting a new Exploratory trial licenses for 3 months past the expiration of their previous Exploratory trial license.

Manage the free version of Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

In the free version of Microsoft Teams, the first person who signs up in your organization has a limited admin role. The person who has this limited role can add and remove team members and specify whether anyone can invite additional members, but this user has no advanced administrative capabilities and no access to the Microsoft Teams admin center. To learn more, read Invite people to Teams (free).

To get the full set of Teams features, including enhanced administration, you'll need to upgrade to the full version of Teams by purchasing an appropriate Microsoft 365 or Office 365 subscription plan for your users.

To find out more about Teams versions and their capabilities, see Compare Teams plans.

More information

- For a quick summary of the differences between Teams and Teams free, see Differences between Microsoft Teams and Microsoft Teams free.
- For more information about upgrading to the full version of Teams, see Upgrade from Teams free to Teams and Upgrade Microsoft Teams free to subscription version.
- To get started with additional admin tasks associated with upgrading users, including adding user licenses, changing user names, and assigning temporary passwords, see For admins upgrading from Teams free to a paid subscription.

Get the right Teams trial

- As an alternative to Teams Free, check out Teams Exploratory.
- EDU customers should use the free Office 365 A1 license.

Upgrade Microsoft Teams free to subscription version

12/5/2020 • 3 minutes to read • Edit Online

If your organization is using the free version of Microsoft Teams, you can easily upgrade to the full version by purchasing a Microsoft 365 or Office 365 subscription plan for your users. The full version provides additional Teams features — like scheduling, audio conferencing, enhanced administration, and security capabilities — that the free version doesn't provide. Microsoft 365 and Office 365 combine the familiar Microsoft Office desktop suite with cloud-based versions of Microsoft's next-generation communications and collaboration services — including Exchange Online, SharePoint Online, and Office — to help users be productive from virtually anywhere through the internet. When you upgrade Teams, your existing Teams data will not be lost; all your teams, channels, chats, files, and permissions come with you.

> **NOTE**
> If you already have a Microsoft 365 or Office 365 subscription, you're eligible for the trial version of Teams (with your corporate identity), not the free version. The Teams trial provides the full version of Teams for a limited time. For more information, see Manage the Microsoft Teams Commercial Cloud Trial offer.

How does Teams free compare to the full version of Teams?

Teams free is designed for small to medium businesses and has the following features:

- 500,000 maximum users
- Unlimited chat messages and search
- Guest access
- Integration with apps and services, including the Online versions of Word, Excel, PowerPoint, and OneNote
- 2 GB of storage per user and 10 GB of shared storage
- 1:1 and group online audio and video calling
- Channel meetings
- Screen sharing

The full version of Teams included with a Microsoft 365 or Office 365 subscription provides the following features in addition to the features that Teams free provides:

- No user limit (with an enterprise license)
- Exchange email hosting and custom email domain
- OneDrive, SharePoint, Planner, Yammer, and more Microsoft 365 and Office 365 services
- 1 TB of storage per user
- Scheduled meetings
- Audio conferencing
- Enhanced security and compliance features, including multi-factor authentication, single sign-on, and advanced auditing and reporting
- Administrative controls and support features, including 24 x 7 phone and web support, admin tools for managing users and apps, usage reporting for Microsoft 365 or Office 365 services, service-level agreement, and configurable user settings and policies

For a detailed comparison of Teams free and Teams features, see Compare Teams plans.

Upgrade requirements

You can upgrade to the full version of Teams if you meet the following requirements:

- You are the person who signed up for the existing Teams free subscription.
- If you are bringing your own domain, it isn't already associated with Azure Active Directory (via trial or purchased Microsoft 365 or Office 365 subscription).

> **NOTE**
>
> To upgrade and transfer your data, you have to buy your subscription through the upgrade process in the Teams application. If you purchased Microsoft 365 or Office 365 with Teams without going through the upgrade process, you can't transfer your data because you will already have a separate tenant.

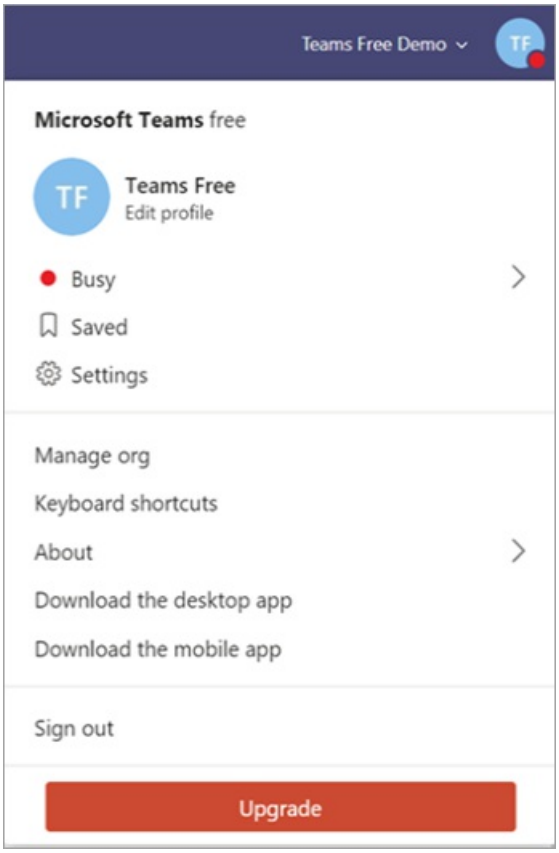
Limitations

Keep the following limitations in mind:

- You can't switch back to Teams free after you upgrade.
- You can't merge multiple Teams free tenants into a single paid tenant.
- All users must be in the same domain. (All users will get a sign-in in the format *username@domain.com*.)
- All users must be upgraded: a mix of Teams free and paid subscription users in the same tenant is not supported.

How do I upgrade my organization?

To upgrade to the full version of Teams, select **Upgrade** in Teams.



Enter the email address that you use to sign in to Teams, and then purchase an Microsoft 365 Business Standard plan. If you would like to purchase Microsoft 365 Business Basic or an Enterprise edition of Office 365, contact support.

What's next?

After your upgrade is complete, see Get started with Microsoft Teams for first steps and Adopt Microsoft Teams for a phased approach to Teams adoption across your organization.

More information

- To find out more about Teams versions and their capabilities, see Compare Teams plans.
- For more information about upgrading to the full version of Teams, see Upgrade from Teams free to Teams.
- For additional admin tasks associated with upgrading users, including adding user licenses, changing user names, and assigning temporary passwords, see For admins upgrading from Teams free to a paid subscription.
- For information about managing Teams free in your organization, see Manage the free version of Microsoft Teams.

Advanced Communications add-on for Microsoft Teams

12/5/2020 • 2 minutes to read • Edit Online

Effective August 1, 2020, Advanced Communications is available as a Microsoft Teams add-on SKU to any paid Microsoft 365 or Office 365 subscription.

If your organization is looking to further enhance your communication experience, get Advanced Communications for calling and meeting capabilities that include large meetings, meeting customization, and tools to manage your organization's communications policies.

What is Advanced Communications?

Advanced Communications provides enhanced calling and meeting capabilities that address a spectrum of communication needs, including the following:

- **Reach larger audiences**: Help your users stay connected with live events for up to 20,000 participants and interactive meetings for 1,000 participants with the capability to enable up to 20,000 participants in a view-only meeting experience.
- **Tailor and customize meetings**: Drive standardization across meetings for your internal and custom-facing scenarios, with features such as custom branded meeting lobby. Implement with flexibility across your organization's departments.
- **Manage your organization communications**: Monitor, track, and analyze data on users and devices to ensure a smooth experience.

Advanced Communications is available in all Microsoft 365 markets as an add-on to any paid Microsoft 365 or Office 365 subscription. Features included in Advanced Communications won't be added to other Microsoft 365 or Office 365 plans and can't be purchased separately. To get the features, you must purchase the add-on.

> **NOTE**
> Advanced Communications isn't yet available for Microsoft 365 Government Community Cloud (GCC), GCC High, or Department of Defense (DoD) environments. We're planning on making it available later.

Feature availability

At release on August 1, 2020, the following features are available:

- Live events support for up to 20,000 participants, 50 concurrent events, event duration of 16 hours per broadcast

The following features will be available later this year:

- Interactive Teams meetings for up to 1,000 participants
- Interactive Teams meetings for 1,000 participants with the capability to enable up to 20,000 in a view-only meeting experience
- Custom branded meeting lobby

We'll be adding more customizations, tools, and communications enhancements in the coming months.

Note that Advanced Communications doesn't include communications compliance and communications data loss prevention (DLP).

Pricing

Advanced Communications is $12 per user/month. Keep in mind that only meeting organizers need a license. Meeting attendees don't need a license.

Trial offer

A 60-day trial is available starting August 4, 2020. You can get the trial through the Microsoft 365 admin center.

Difference between overflow meetings and live events

With Advanced Communications, any meeting with more than 300 attendees will provide a way for up to 1,000 participants to have an interactive experience, and up to 20,000 participants to join the meeting in a view-only experience. Live event enables additional capabilities. In live events, 20,000 attendees can watch the broadcast, and interact with Q&A in Teams, conversations in Yammer, or view-only in Microsoft Stream. Additionally, we're increasing the length of the live events from 4 hours to 16 hours and enabling up to 50 concurrent live events per tenant.

> **NOTE**
>
> The change from using Microsoft Stream to OneDrive for Business and SharePoint for meeting recordings will be a phased approach. At launch you'll be able to opt-in to this experience, in November you'll have to opt-out if you want to continue using Stream, and some time in early 2021 we'll require all customers to use OneDrive for Business and SharePoint for new meeting recordings.

> **NOTE**
>
> Enterprise and Education SKUs can temporarily hold live events for up to 20,000 attendees, with an event duration of 16 hours per broadcast, and 50 concurrent events within a tenant until January 1, 2021.

Related topics

Teams policy-based recording for calling and meetings

Messaging policies licensing

11/2/2020 • 2 minutes to read • Edit Online

We're hearing from customers around the globe how the COVID-19 (Coronavirus) pandemic has created new challenges as they work to handle drastic shifts in their day-to-day operations. Being able to directly and quickly connect with teammates during fast-changing conditions is essential to maintaining business continuity during the crisis response and as many of us return to the workplace.

Originally announced in June 2019, priority notifications for Microsoft Teams grants users the ability to continually send notifications that repeat every two minutes for up to 20 minutes on all messages marked as urgent. Priority notifications had been made available as a promotion to all Teams customers until the second half of 2020.

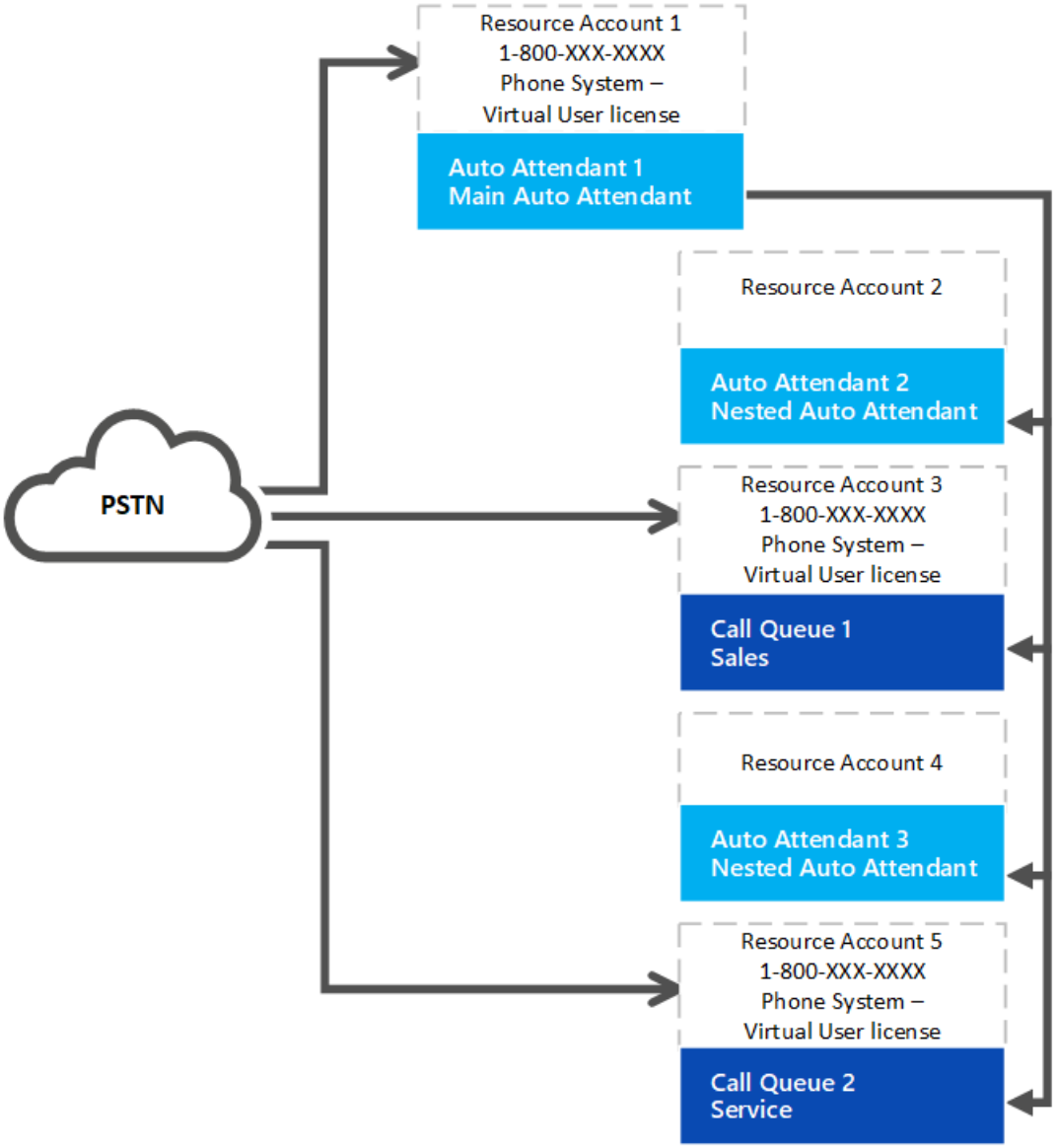
Effective immediately, we have ended this promotion and made priority notifications available to all Teams customers as a basic capability. Users will now be able to send and receive unlimited urgent messages with priority notification. Learn more about managing priority notifications.

Microsoft 365 Phone System – Virtual User license

6/24/2020 • 3 minutes to read • Edit Online

Organizations with Phone System licensed users can assign either a free Microsoft 365 Phone System – Virtual User license or a paid Phone System user license to resource accounts. A Calling Plan isn't required. All auto attendants or call queues require an associated resource account. Resource accounts that require a phone number need a free Microsoft 365 Phone System – Virtual User license or a paid Phone System user license before a phone number can be applied to the resource account.

> **TIP**
> No license is needed for resource accounts that will be used with nested auto attendants or call queues that don't have a phone number assigned. See the following diagram for reference:



Virtual User license allocation

Your organization is allotted Microsoft 365 Phone System – Virtual User licenses depending on its overall size. Any organization that has at least one license including Phone System or has Phone System added has 25 Virtual User

licenses available at no cost. When you add 10 Phone System user licenses in your organization, one more Microsoft 365 Phone System – Virtual User license becomes available.

> **NOTE**
> Phone System is an add-on license available with Microsoft 365 and Office 365 E1 and E3. Phone System is also included as part of Microsoft 365 E5, Office 365 E5, and Microsoft 365 Business Voice licenses.

If your organization uses up the available free Microsoft 365 Phone System – Virtual User licenses in creating auto attendant or call queue nodes, you can still use the paid Phone system licenses with a resource account. Most organizations will have enough Virtual User licenses based on the scaling plan.

License allocation example

Contoso, Inc. purchased 600 licenses that included Phone System (one for each employee). Contoso is allotted an initial 25 plus 60 Microsoft 365 Phone System – Virtual User licenses, 85 in total. Their organization has 90 call queues and auto attendants that have phone numbers. They need to assign all the Microsoft 365 Phone System – Virtual User licenses and obtain five regular-priced Phone System licenses.

Contoso should consider redesigning the auto attendant and call queue system. If they use fewer phone numbers and more nested nodes that don't need a phone number, they simplify the implementation and reduce costs.

How to buy Microsoft 365 Phone System – Virtual User licenses

1. Sign in to the Microsoft 365 admin center.
2. Go to **Billing** > **Purchase services** > **Add-ons**
3. Scroll to the end to find the **Microsoft 365 Phone System – Virtual User** license. Select **Buy now**.

> **NOTE**
> Keep in mind you must still **Buy** the license even though it has a cost of zero.

Change an existing resource account to use a Microsoft 365 Phone System – Virtual User license

If you decide to switch the license on your resource account from a Phone System license to a Microsoft 365 Phone System – Virtual User license:

1. Get the new Microsoft 365 Phone System – Virtual User license.
2. Follow the linked steps in the Microsoft 365 Admin center to Move users to a different subscription.

> **WARNING**
> Always remove a full Phone System License and assign the Microsoft 365 Phone System – Virtual User license in the same license activity. If you remove the old license, save the account changes, add the new license, and then save the account settings again, the resource account may no longer function as expected. If this happens, we recommend you create a new resource account for the Microsoft 365 Phone System – Virtual User license and remove the broken resource account.

Related information

Auto Attendant and Call Queues Service Update

Manage resource accounts in Microsoft Teams

Microsoft 365 Groups and Microsoft Teams

10/13/2020 • 2 minutes to read • Edit Online

Microsoft 365 Groups is the cross-application membership service in Microsoft 365. At a basic level, a Microsoft 365 Group is an object in Azure Active Directory with a list of members and a coupling to related workloads including a SharePoint team site, shared Exchange mailbox, Planner and Power BI workspace. You can add or remove people to the group just as you would any other group-based security object in Active Directory.

By default, users in Microsoft 365 can create and manage groups. For more information about Microsoft 365 Groups, see Learn about Microsoft 365 Groups and the Groups in Microsoft 365 for IT Architects poster.

How Microsoft 365 Groups work with Teams

When you create a team, a Microsoft 365 group is created to manage team membership. The group's related services, such as a SharePoint site, Power BI workspace, etc. are created at the same time.

People who create teams can choose to use an existing Microsoft 365 group if they are an owner of that group. Each channel in the team has a separate folder in the document library. Creating folders directly in the document library does not create channels in the team.

When creating a Microsoft 365 group in Outlook or SharePoint, the group mailbox is visible in Outlook. When creating a team in Teams, the group mailbox is hidden by default. You can use the Set-UnifiedGroup cmdlet with the **HiddenFromExchangeClientsEnabled** parameter to make a mailbox visible.

Group membership

If you remove a member of a team, they are removed from the Microsoft 365 group as well. Removal from the group immediately removes the team and channels from the Teams client. If you remove a person from a group using the Microsoft 365 admin center, they will no longer have access to the other collaborative aspects such as SharePoint Online document library, Yammer group, or shared OneNote. However, they will still have access to the team's chat functionality for approximately two hours.

As a best practice for managing team members, add and remove them from the Teams client to ensure that permissions updates for other group-connected workloads occur quickly. If you add or remove team members outside of the Teams client (by using the Microsoft 365 admin center, Azure AD, or Exchange Online PowerShell), it can take up to 24 hours for changes to be reflected in Teams.

Deleting groups and teams

Deleting a Microsoft 365 group will remove the mailbox alias for persistent Outlook/OWA conversations and Teams meeting invites, and mark the SharePoint site for deletion. It takes approximately 20 minutes between the removal of a team and its effect on Outlook. Deleting a team from the Teams client will remove it immediately from view to all who are members of the team. If you remove members of a Microsoft 365 Group that has had Teams functionality enabled on it, there could be a delay of approximately two hours before the team is removed from view in the Teams client for the affected people who were removed.

For details about groups and teams end of lifecycle options, see End of lifecycle options for groups, teams, and Yammer and Archive or delete a team in Microsoft Teams.

Related topics

Foundations of Microsoft Teams (video)

Restore a deleted Group

Create a Microsoft 365 resource account using the Microsoft 365 admin center

5/16/2020 • 3 minutes to read • Edit Online

Microsoft 365 resource accounts are mailbox and Teams accounts that are dedicated to specific resources, such as a room, projector, and so on. These resource accounts can automatically respond to meeting invites using rules you define when they're created. For example, if you have a common resource such as a conference room, you can set up a resource account for that conference room that will automatically accept or decline meeting invites depending on its calendar availability.

> **IMPORTANT**
>
> Microsoft 365 resource accounts aren't the same as Teams resource accounts. Teams resource accounts can be used with call queues and auto attendants to accept phone calls from external phone numbers. Microsoft 365 resource accounts are tied to an Exchange Online mailbox and enable booking of shared resources, such as rooms, projectors, and so on.
>
> If you want to know more about Teams resource accounts, see Manage resources accounts in Microsoft Teams.

Licensing

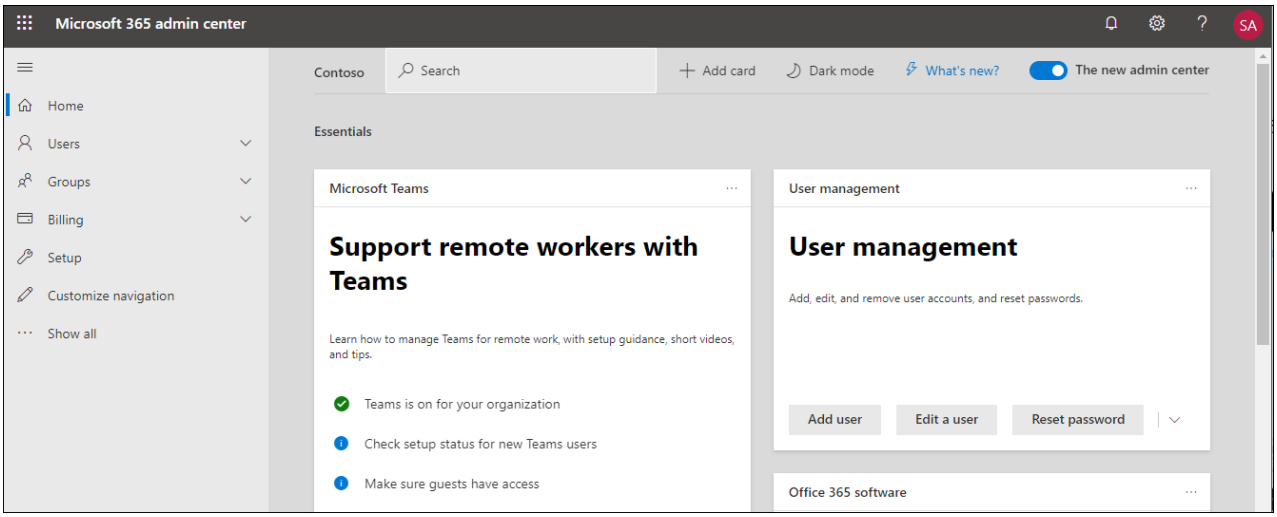
Before you create a Microsoft 365 resource account, check to see what kind of license it needs. If you'll only use a resource account to book a resource (that is, invite the resource to your meeting and have it automatically accept or decline the invitation), you don't need to assign a license to a resource account. You'll need to assign a license to the resource account in the following situations:

- **Teams meeting** If you want the resource (such as a Microsoft Teams Rooms console, collaboration bar, and so on) to join a Teams meeting so attendees can use it to present video and audio through it, you need a Meeting Room license.
- **PSTN calls** If you want the resource to make or receive calls to or from an external phone numbers (called a Public Switched Telephone Network or PSTN call), you need a Microsoft 365 Phone System or Microsoft 365 Business Voice license.

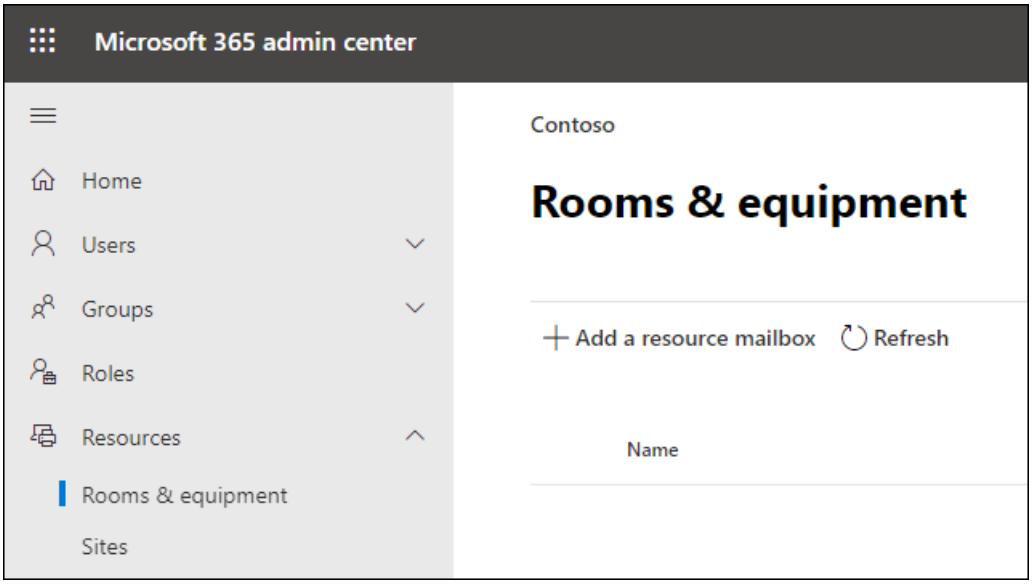
For more information about Meeting Room, Phone System, and Business Voice licenses, see Microsoft Teams add-on licenses

Create a resource account in the Microsoft 365 admin center

1. Sign in to Microsoft 365 by visiting https://admin.microsoft.com
2. Provide the admin credentials for your Microsoft 365 tenant. This will take you to your Microsoft 365 admin center.



3. In the admin center, navigate to **Resources** in the left panel (you might need to select **Show all** first), and then select **Rooms & equipment**.

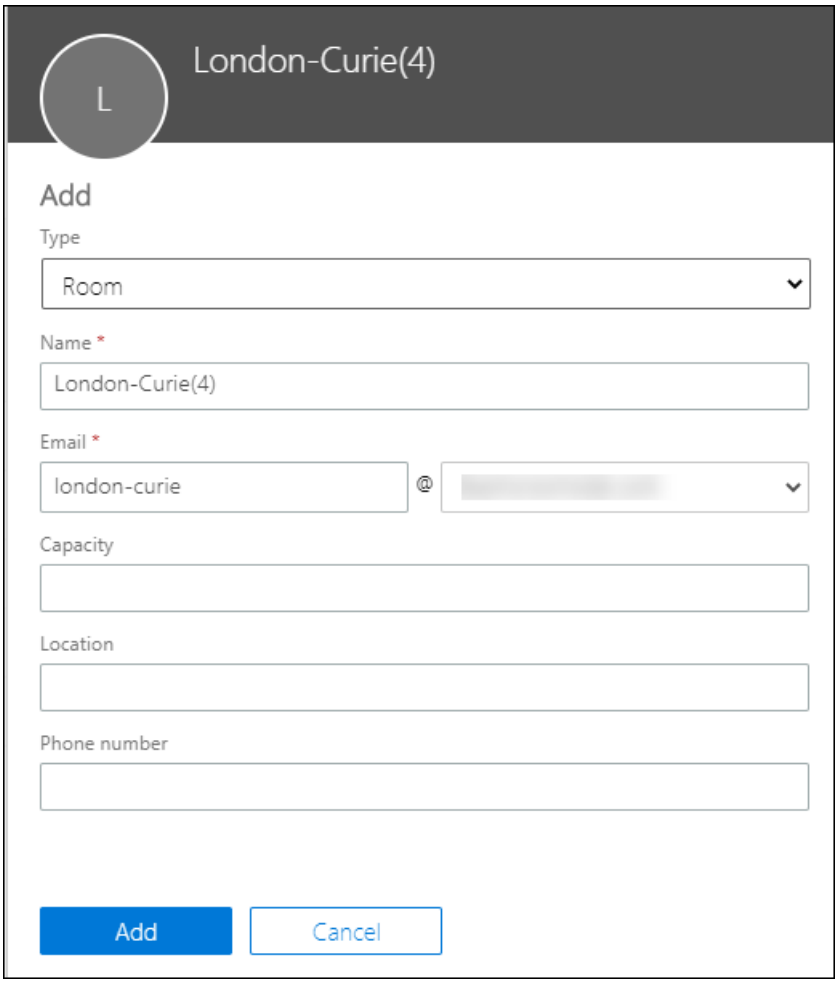


4. Select **Add a resource mailbox** to create a new room account. Enter a display name and email address for the account, select **Add**, and then select **Close**. We recommend you standardize on a naming convention for all of your resource accounts.

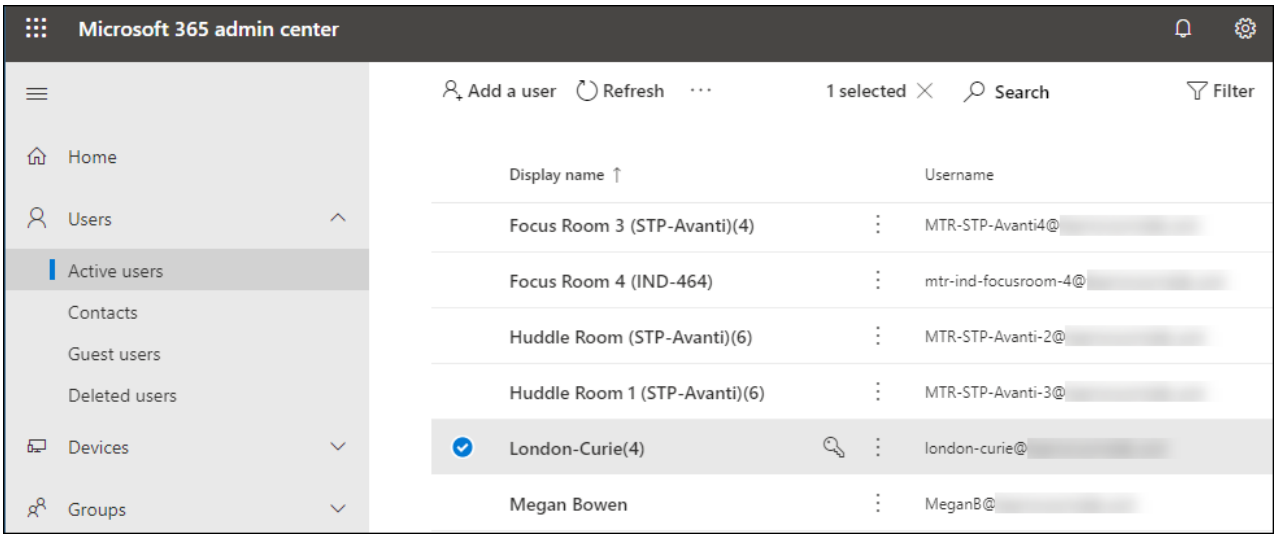
NOTE

By default, resource accounts are set up with the following settings. If you want to change them, select **Set scheduling options** before you select **Close**. If you want to change them later, navigate to **Resources** > **Rooms & equipment**, select the resource account and then select **Edit** under **Booking options**.

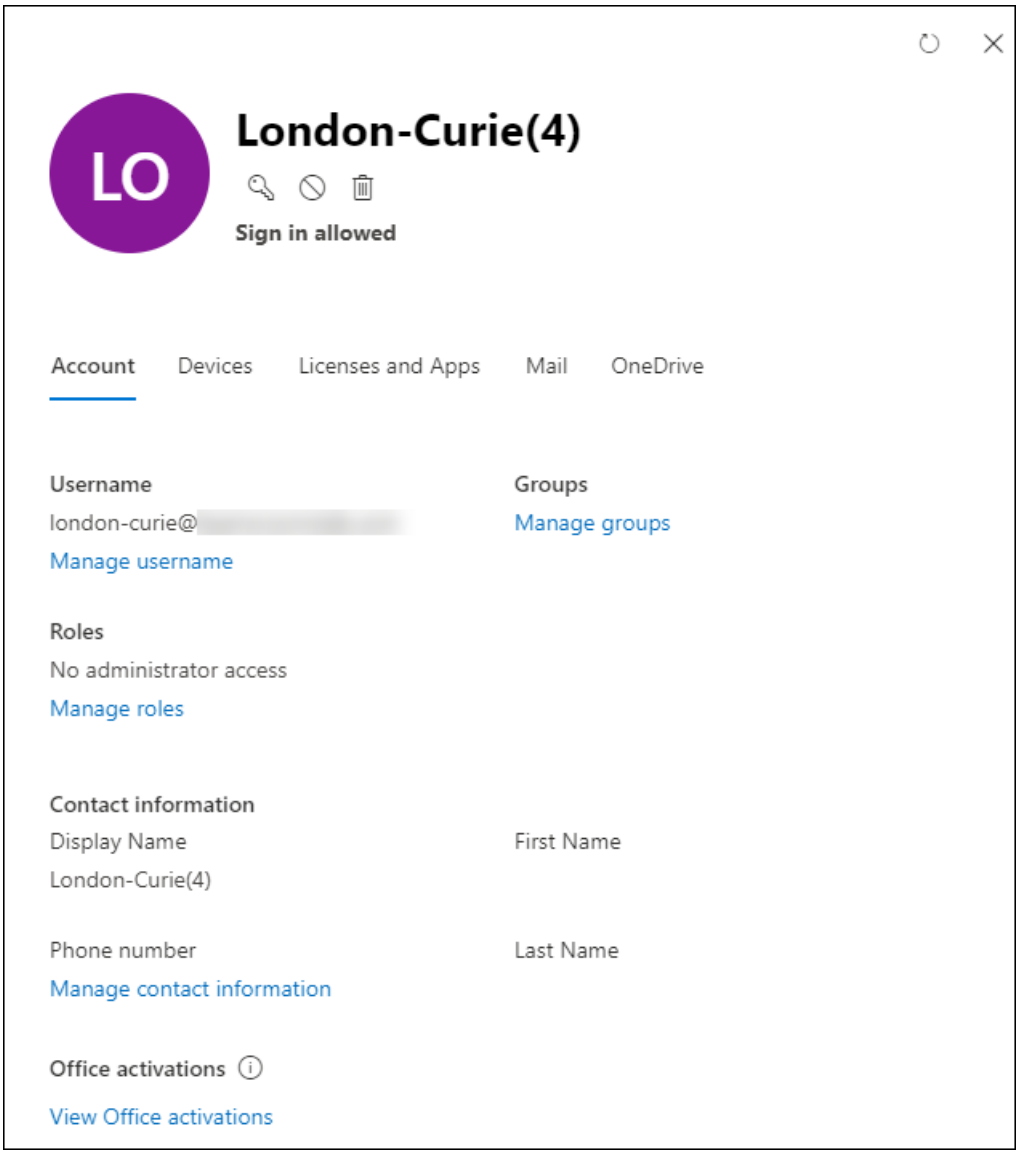
- Allow repeat meetings
- Automatically decline meetings outside of the following limits
  - Booking window (days): 180
  - Maximum duration (hours): 24
- Auto accept meeting requests



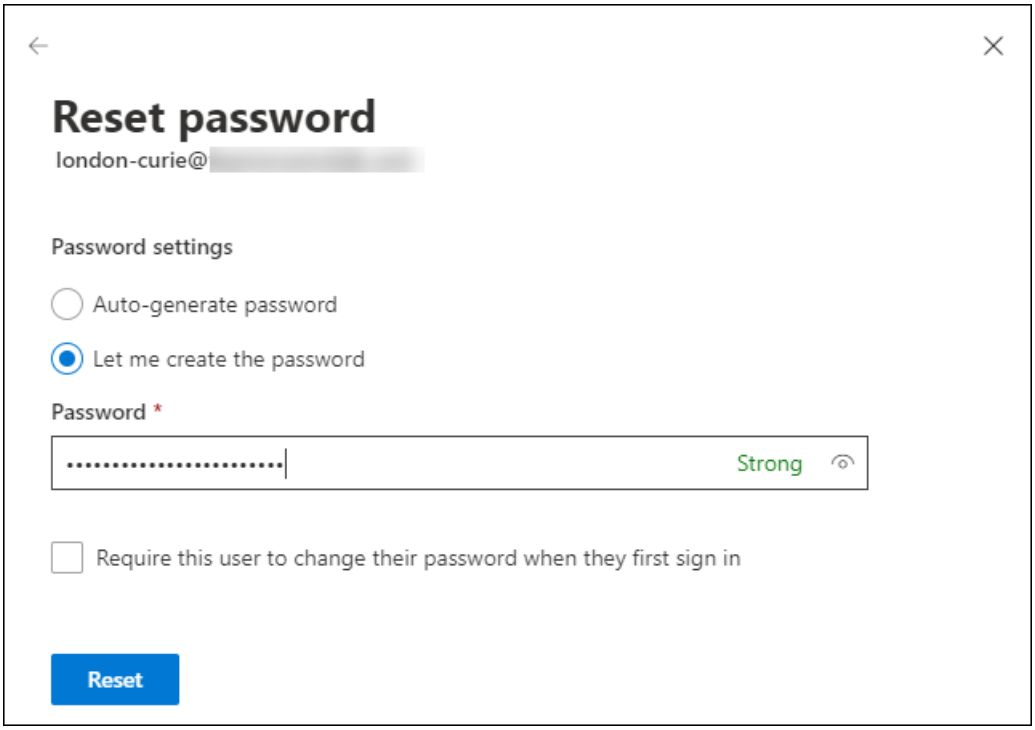
5. Navigate to the **Users** section in admin center and, in the **Active users** list, you will see the room you just created.



6. Select on the name of the room and an account properties panel will appear on the right.

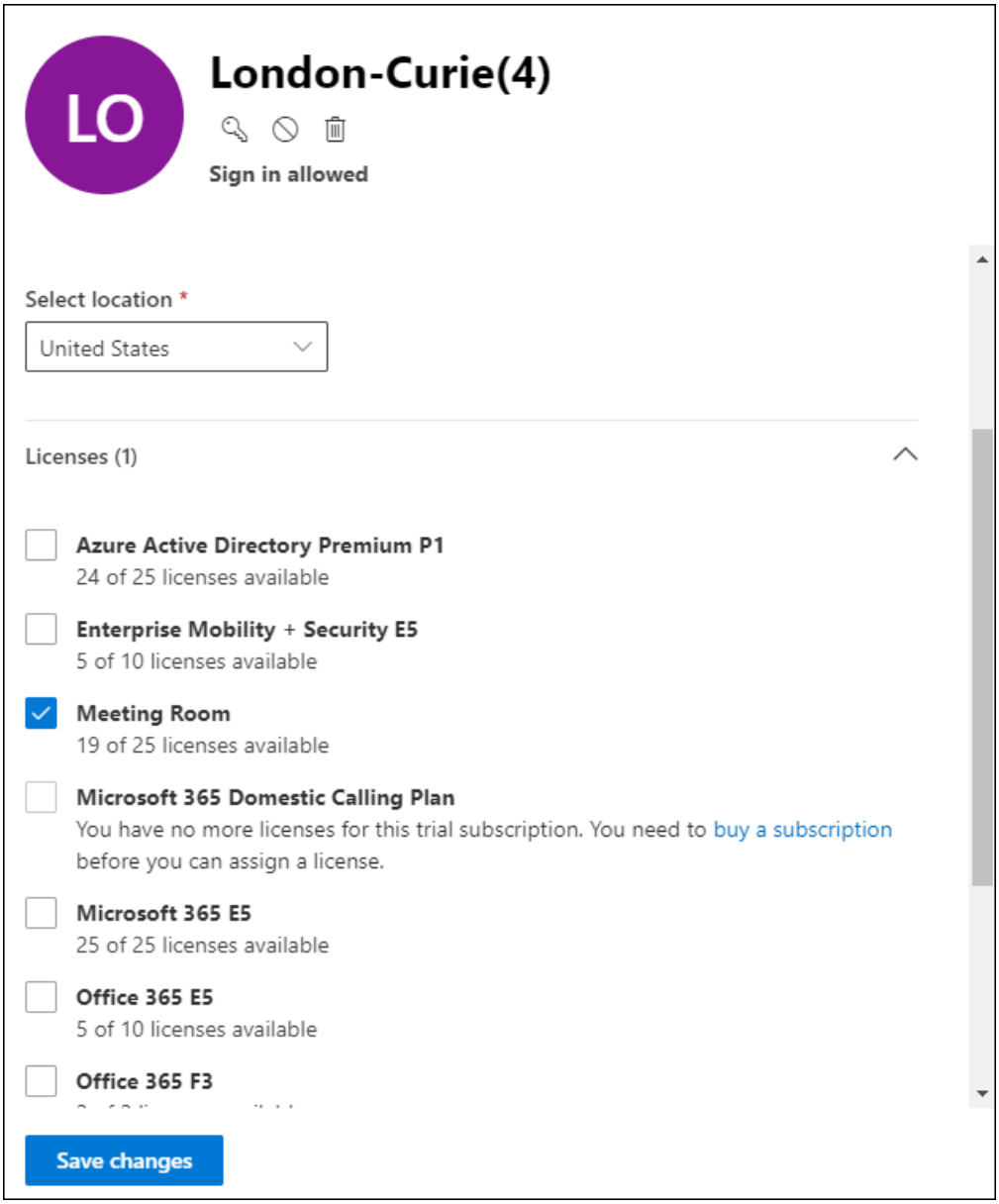


7. Now you need to assign a password to the resource account. In the panel, you can see the account properties and several optional actions. Select the **Reset password** key icon under the username to change the password. Unselect **Require this user to change their password when they first sign in**. It is not possible to change the password via the device sign-in process. Select **Reset**.



8. In the **Licenses**

and Apps section, set **Select location** to the country or region where the device will be installed. Scroll down and check the box next to the license to be assigned - such as Meeting Room - and then select **Save changes**. The license may vary depending on your organization.



Enhance existing Microsoft 365 groups with Microsoft Teams

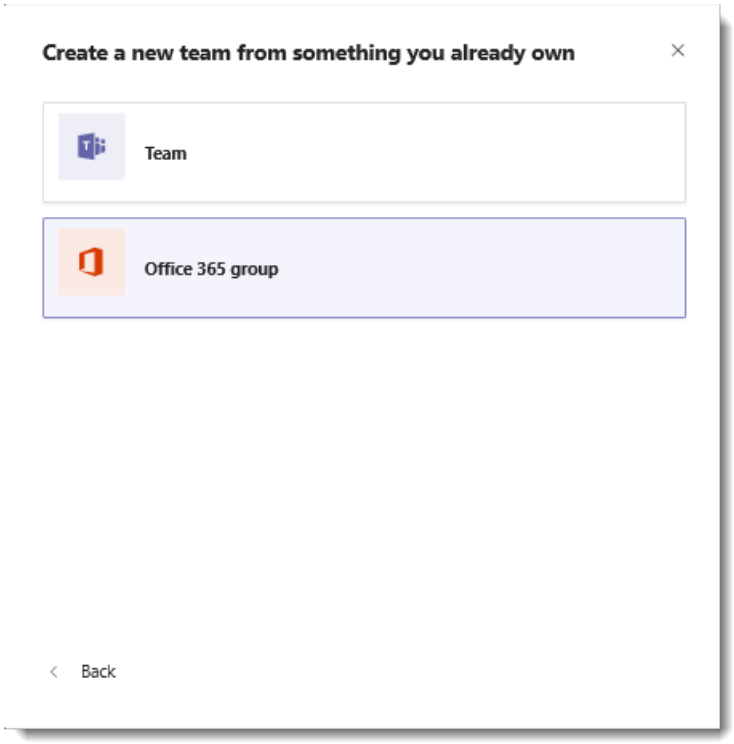
8/6/2020 • 2 minutes to read • Edit Online

Microsoft Teams users can enhance an existing Microsoft 365 Group with Teams functionality. When looking at enhancing a public Microsoft 365 Group, users can do that if the number of members is equal to or less than 5,000.

To do this, users should go through the flow of creating a new team from the Microsoft Teams client. Select **Create from** > **Microsoft 365 group**, and then choose the existing group that you want to enhance with Teams. Existing group members will be added as members to the team automatically.

> **IMPORTANT**
>
> Only Microsoft 365 Group owners have permission to enhance an existing group with Teams, and that group must contain less than 5,000 users. Teams that have already been enhanced will not show up in the list.
>
> The option to create a team from a Microsoft 365 Group will not be available unless these conditions have been met.

Users can also invite a distribution list to a team, and the members of that distribution list will be added to the team. This is a one-time add, and later changes in group membership in the distribution list will not be replicated or synced to Teams.



You can also add mail-enabled security groups as members of a team. But, if you later add more members to the security group, those members are not automatically added to the team. You must add the new members separately or re-add the security group to the team. (If you re-add the security group, deduplication makes sure members are added only once.)

There are two types of privacy settings with Microsoft 365 groups, **public and private**. Whereas both group types can be enabled for Teams, there is a slight difference when it comes to self-service.

- Users can search for public groups and can join by themselves without a need for team owner's approval.
- Private groups are not searchable, and users cannot join unless a team owner add them as a member.

When creating a new team in Teams, an owner of an existing private Microsoft 365 group has an option to use the membership in the Microsoft 365 group to create the team. Users can add their existing SharePoint and OneNote files by adding a tab for SharePoint and merging OneNote files.

How Exchange and Microsoft Teams interact

11/2/2020 • 7 minutes to read • Edit Online

> **TIP**
> Watch the following session to learn how Teams interacts with Azure Active Directory (AAD), Microsoft 365 Groups, Exchange, SharePoint and OneDrive for Business: Foundations of Microsoft Teams

For the full Teams experience, every user should be enabled for Exchange Online, SharePoint Online, and Microsoft 365 Group creation.

Users' Exchange mailboxes can be hosted online or on-premises.

Users hosted on Exchange Online or Exchange Dedicated vNext can use all the features of Teams. They can create and join teams and channels, create and view meetings, call and chat, modify user profile pictures (if the Outlook on the web mailbox policy allows them to do so), and add and configure connectors, tabs, and bots. For a more comprehensive list of available features, see the table below.

Users hosted on Exchange Online Dedicated (Legacy) must be synchronized to Azure Active Directory on Microsoft 365 or Office 365. They can create and join teams and channels, add and configure tabs and bots, and make use of the chat and calling features. However, they cannot modify profile pictures, manage meetings, access outlook contacts, or manage connectors.

> **IMPORTANT**
> For integration with on-premises, it's highly recommended that you have an Exchange full Classic Hybrid deployment with Exchange Server 2016 or later. Modern Hybrid support is limited to Free/Busy and will not provide calendar integration from Teams to mailboxes on-premises, for example. For more information about setting up a hybrid deployment, see Exchange Server hybrid deployments.

Users with mailboxes hosted on-premises must be synchronized to Azure Active Directory. They can make use of all the features in the above scenario, but additionally, they can manage meetings if the requirements listed on Requirements for mailboxes hosted on-premises section are met.

The following table provides a helpful quick reference to feature availability based on the Exchange environment.

Actions supported:

USER'S MAILBOX IS HOSTED IN:	EDISCOVERY	LEGAL HOLD	RETENTION	TEAM AND CHANNEL MGMT	CREATE AND VIEW MEETINGS IN TEAMS	MODIFY USER PROFILE PICTURE	CALL HISTORY	MANAGE CONTACTS	ACCESS OUTLOOK CONTACTS	VOICEMAIL	ADD AND CONFIGURE CONNECTORS	ADD AND CONFIGURE TABS	ADD AND CONFIGURE BOTS
Exchange Online	Yes [1]	Yes [1]	Yes	Yes	Yes	Yes[7]	Yes	Yes	Yes [6]	Yes	Yes	Yes	Yes
Exchange Online Dedicated vNext	Yes [1]	Yes [1]	Yes	Yes	Yes	Yes[7]	Yes	Yes	Yes [6]	Yes	Yes	Yes	Yes
Exchange Online Dedicated – Legacy (Sync to Azure AD required)	Yes [1]	Yes [1,2]	Yes [3]	Yes	No	No	Yes	Yes	No	Yes [4]	Yes [5]	Yes	Yes
Exchange On-premises (Sync to Azure AD)	Yes [1]	Yes [1]	Yes [3]	Yes	Yes [8]	No	Yes	Yes	No	Yes [4]	Yes [5]	Yes	Yes

[1] eDiscovery and Legal Hold for compliance on channel messages is supported for all hosting options.

[2] Teams private chat messages are not yet supported for Legal Hold for this hosting option.

[3] Retention will use a shadow mailbox for the online user to store messages.

[4] Teams users with on-premises Exchange mailbox may use voicemail with Teams and receive voicemail messages in Outlook, but voicemail messages will not be available to view or play within the Teams client.

[5] If one of the owners of a team can add connectors, everyone else in that team will be able to do so, even if their mailboxes are homed on-premises.

[6] Only contacts in default contacts folder. Access to other contacts folders or sub-folders is not supported.

[7] Teams honors the Outlook on the web mailbox policy setting that's configured by tenant admins to control whether users can change their profile picture. If the **-SetPhotoEnabled** setting is turned off in the policy, users cannot add, change, or remove their profile picture. For example, if a user uploads a profile picture that's approved by your organization's IT or HR department, no action is needed. However, if a user uploads an inappropriate picture, change it according to your organization's internal policies.

[8] You need to meet the requirements listed in the Requirements to create and view meetings for mailboxes hosted on-premises section.

Requirements to get the most out of Microsoft Teams

Microsoft Teams works with several Microsoft 365 and Office 365 services to provide users with rich experience. To support this experience, you need to enable certain features or services and assign licenses.

- Users must be assigned an Exchange Online license.
- SharePoint Online is required to share and store files in team conversations. Microsoft Teams doesn't support SharePoint on-premises.
- Users must be assigned a SharePoint Online license if they want to share files in Chats. If users aren't assigned and enabled with SharePoint Online licenses, they don't have OneDrive for Business storage in Microsoft 365 or Office 365. File sharing will continue to work in Channels, but users are unable to share files in Chats without OneDrive for Business storage in Microsoft 365 or Office 365.
- Users must be enabled for Microsoft 365 group creation to create teams in Microsoft Teams.

> **IMPORTANT**
>
> If you uninstall the Skype for Business client after you move a user to **Teams Only** mode, presence may stop working in Outlook and other Office apps. Presence works fine in Teams. To resolve this issue, select your profile picture in the top right-hand corner of Microsoft Teams and then select **Settings**. On the **General** tab under **Application**, select **Register Teams as the chat app for Office (requires restarting Office applications)**. After you select this option, close and re-open all Office apps, including Outlook. After you open Outlook, presence information will be available.

Requirements to create and view meetings for mailboxes hosted on-premises

If mailboxes are hosted on-premises, to create and view meetings, the following requirements must be met:

- The required Teams license needs to be assigned for the Azure Active Directory synced user.
- Users must be synchronized to Azure Active Directory. For information about how to use Azure AD Connect to synchronize with Azure Active Directory, see Hybrid identity documentation.
- Mailboxes are hosted in Exchange Server 2016 Cumulative Update 3 or later.
- Autodiscover and Exchange Web Services is published externally.

- OAuth authentication is configured preferably via the Exchange Hybrid Configuration Wizard running a full hybrid configuration (Classic or Modern). If you are not able to use the Hybrid Configuration Wizard, configure OAuth as described in Configure OAuth authentication between Exchange and Exchange Online organizations.

  > **NOTE**
  > Exchange trusts OAuth Token from Teams service which is known as EvoSTS. Step 1 should be enough, but just the EvoSTS; ACS is used for Free/Busy lookup in the calendar.

- The checkbox for the Exchange Hybrid Deployment feature in Azure AD Connect is set.
- For calendar app support and Teams Outlook Add-In for Mac, Exchange Web Service URLs must be configured as SPNs in Tenant Azure AD for the Exchange Service Principal. This step is done with Hybrid Configuration Wizard or following manual steps for Hybrid Modern Authentication.

To enable calendar delegation for these users:

- You must also complete steps 2-3 as described in Configure Integration and OAuth between Skype for Business Online and Exchange Server; these steps will provide the Teams scheduling application the required permissions to confirm delegate permissions.

  > **NOTE**
  > Step 2 includes role assignment for ArchiveApplication, which is not required for delegation.

- Teams Scheduling add-in for Outlook when scheduling a meeting on behalf of someone requires Exchange 2013 CU19 or later. This is to support the unauthenticated discovery of the mailbox by our service to check delegate permissions against the delegator mailbox. The delegate and delegator location could be Exchange 2013 or later, or Exchange online, but Autodiscover must resolve to Exchange 2013 CU19 or later.

Additional considerations

Here are some extra things to think about as you implement Microsoft Teams in your organization.

- In Microsoft Teams, security and compliance features like eDiscovery, Content Search, archiving, and legal hold work best in Exchange Online and SharePoint Online environments. For channel conversations, messages are journaled to the group mailbox in Exchange Online, where they're available for eDiscovery. If SharePoint Online and OneDrive for Business (using work or school account) are enabled across the organization and for users, these compliance features are available for all files within Teams as well.
- Control and protect the configuration of compliance policies in Teams and Exchange using Conditional Access. For more information see How do Conditional Access policies work for Teams?
- If your organization has compliance requirements to ensure all meeting discussions are discoverable, you should disable private meetings if the organizer has an Exchange on-premises mailbox. For more information, see Allow scheduling private meetings.
- In an Exchange hybrid deployment, content from chat messages is searchable regardless of whether chat participants have a cloud-based mailbox or an on-premises mailbox. To learn more, read Searching cloud-based mailboxes for on-premises users. To learn about searching for content in Teams, read Content Search in the Microsoft 365 Compliance Center.

Troubleshooting

For a full troubleshooting guide on the topic, make sure to check out Troubleshoot Microsoft Teams and Exchange Server interaction issues.

Configure an Exchange hybrid organization for use with Microsoft Teams

8/3/2020 • 2 minutes to read • Edit Online

Generally, you should not have to configure any Exchange Online functionality for use with Microsoft Teams. However, for Exchange Hybrid scenarios, there are steps necessary to ensure Group memberships are synchronized between Exchange Server (on-premises) and Exchange Online. This involves enablement of Group Writeback functionality in Azure AD Connect along with various initialization scripts: Configure Microsoft 365 Groups with on-premises Exchange hybrid.

How SharePoint Online and OneDrive for Business interact with Microsoft Teams

8/6/2020 • 3 minutes to read • Edit Online

TIP

Watch the following session to learn how Teams interacts with Azure Active Directory (AAD), Microsoft 365 Groups, Exchange, SharePoint and OneDrive for Business: Foundations of Microsoft Teams

Each team in Microsoft Teams has a team site in SharePoint Online, and each standard channel in a team gets a folder within the default team site document library. Files shared within a conversation are automatically added to the document library, and permissions and file security options set in SharePoint are automatically reflected within Teams. To see the impact of changing a site address in SharePoint, read Change a site address.

NOTE

This article applies only to standard channels. The architecture for private channels is different from standard channels. Each private channel has its own SharePoint site collection that's separate from the parent team site. To learn more, see Private channels in Microsoft Teams.

Private chat files are stored in the sender's OneDrive for Business folder, and permissions are automatically granted to all participants as part of the file sharing process.

If users aren't assigned and enabled with SharePoint Online licenses, they don't have OneDrive for Business storage in Microsoft 365 or Office 365. File sharing will continue to work in standard channels, but users won't be able to share files in chats without OneDrive for Business storage in Microsoft 365 or Office 365.

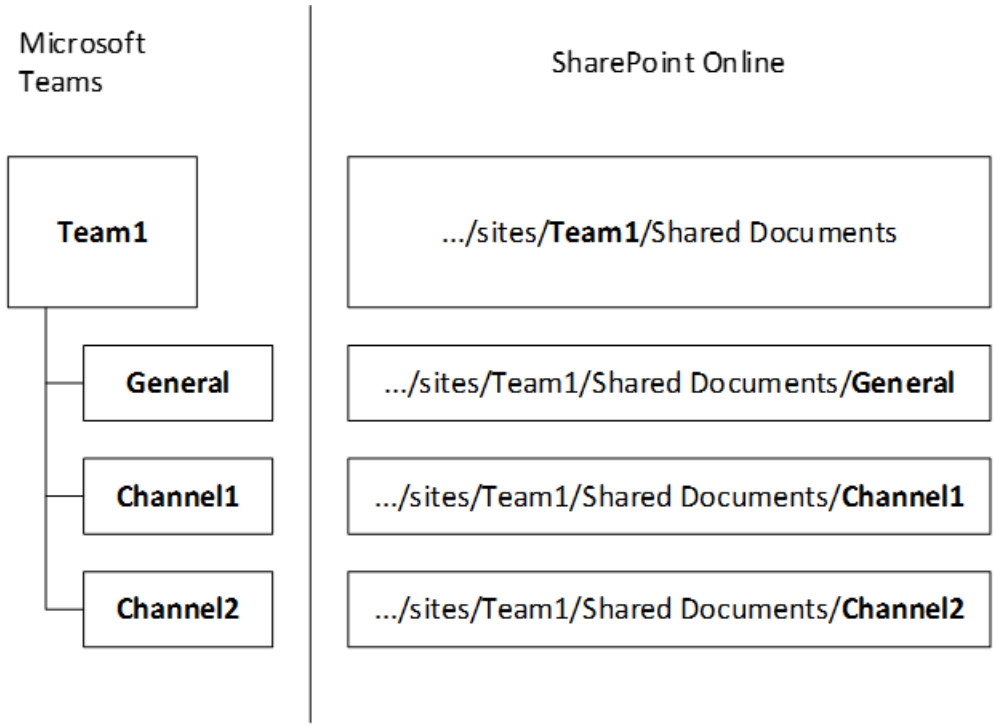
By storing the files in the SharePoint Online document library and OneDrive for Business, all compliance rules configured at the tenant level will be followed.

NOTE

Integration with SharePoint On-premises is not supported for Microsoft Teams at this time.

The following is the example of relationships between team, standard channel, and document library.

For every team, a SharePoint site is created, and the **Shared Documents** folder is the default folder created for the team. Each standard channel, including the **General** channel (the default channel for each team) has a folder in **Shared Documents**.



NOTE

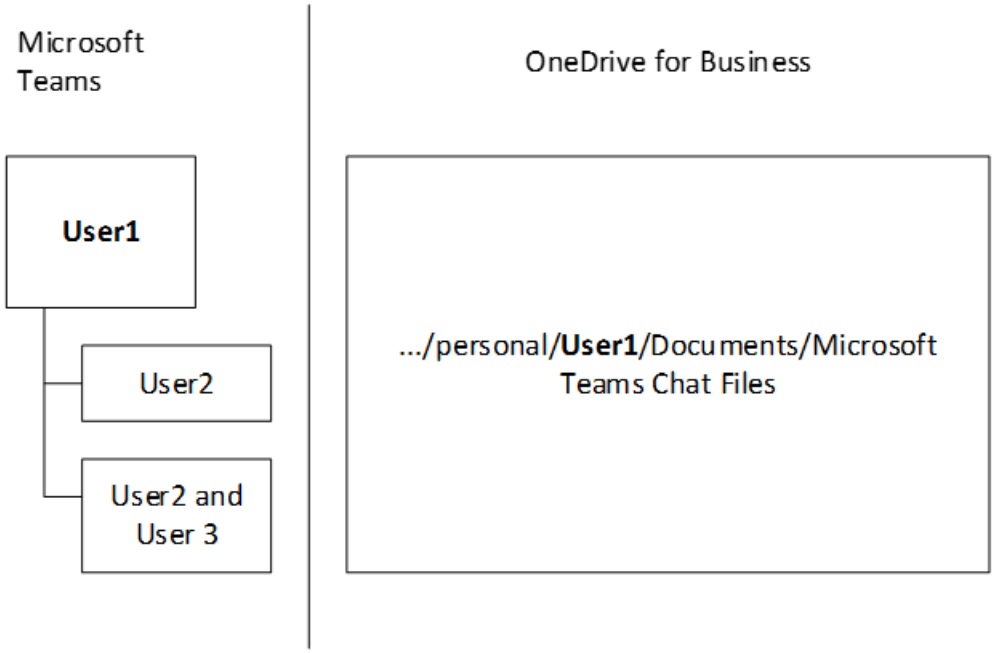
It's not currently possible to replace the default SharePoint site and document library with another one. We've heard from you that you want it, and we're considering it. Check the Teams Roadmap or Teams UserVoice to stay on top of upcoming features.

TIP

To add a tab to your team that links to an existing SharePoint site page or to your existing SharePoint document library:

1. Select the plus sign next to the tabs.
2. Select either **SharePoint** for an existing SharePoint site page or **Document Library** for an existing document library.
3. Select the appropriate page or document library.

For every user, the OneDrive folder **Microsoft Teams Chat Files** is used to store all files shared within private chats with other users (1:1 or 1:many), with permissions configured automatically to restrict access to the intended user only.



Note that for public teams, the SharePoint team site is provisioned with "Everyone except external users" access. The public team isn't displayed in Teams for people who aren't members of that team. However, they can access content on the SharePoint team site using the URL of the SharePoint team site.

Channel Files tab

> This feature hasn't yet been released. It's been announced, and is coming soon. If you're an admin, you can find out when this feature will be released in the Message Center (in the Microsoft 365 admin center).

The **Files** tab in Teams closely resembles the SharePoint documents view. On the **Files** tab, users can:

- See additional options in the **New** file menu.
- Sync files to their local drive.
- On the **All Documents** menu, switch from **List** view to **Compact list** to **Tiles** view.
- Identify files that need attention or have malware.
- Immediately see whether a file is read-only or checked out.
- Check out and check in files.
- Pin, unpin, and change the sort order of files.
- Identify which files need metadata
- Choose from many more filter options.
- Group files based on column headings.
- Modify column settings (move left or right, hide) and column width.

Default link type setting

SharePoint and OneDrive have an admin setting for specifying the default link type for links that are created for a file. Teams is adopting that same approach by reusing the settings that the admin sets for SharePoint and OneDrive. More details about this approach are described in Change the default link type when users get links for sharing.

More information

For more information about how SharePoint works with Teams, see SharePoint and Teams: better together.

To learn more about the guest experience in Teams, read What the guest experience is like.

Teams experience in a Microsoft 365 or Office 365 OneDrive and SharePoint Online Multi-Geo-enabled tenancy

8/6/2020 • 2 minutes to read • Edit Online

Microsoft Teams is group chat software, the hub for teamwork in Microsoft 365 and Office 365. It is powered by the Microsoft 365 Groups service along with SharePoint Online and OneDrive for Business for its files experience. In a OneDrive for Business/SharePoint Online Multi-Geo tenancy, in which the tenant is extended to many geographic locations such as North America, Europe, and Australia, the underlying files experience is Multi-Geo aware, so the Teams experience with file collaboration is also Multi-Geo aware. This is a key leading-edge capability for Teams to surface files hosted across multiple Geos in its native files experience.

For example, in a Contoso tenancy with Europe as a satellite Geo and North America as the central Geo, a European satellite user will see his or her OneDrive files under the Files tab in left pane, although the files are hosted in the Europe data location and the United States is the tenant's central location. Also, the user can access the most recently used files under the Recent view blade. Recent files may include files shared with the user from users in other Geos and might be mastered in other Geo locations that the tenant is extended to.

A given Team's group site is also Multi-Geo aware. That is, if a European satellite user is creating a Team, the corresponding Groups site will be created in the Europe location and the files associated with that Team group will be kept at rest in that location. Any subsequent experiences, such as uploading a new file or editing the file, will be targeted to that European location, keeping the promise of data residency for those files. This is all made possible by the underlying foundation Microsoft 365 Groups becoming Multi-Geo aware.

Because a Multi-Geo tenancy is a single global tenant, during @ mentions satellite users will be able to see their colleagues from across the globe, no matter where they reside.

Note that conversations in chats and meeting IM notes within the Teams experience are not Multi-Geo aware and are all kept only inside the central location of the tenant. Typically, chat conversations aren't applied to data residency needs.

For more information about Multi-Geo, refer to the Microsoft Multi-Geo capabilities page.

Manage your devices in Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

You can manage devices used with Microsoft Teams in your organization from the Microsoft Teams admin center. You can view and manage the device inventory for your organization and do tasks such as update, restart, and monitor diagnostics for devices. You can also create and assign configuration profiles to a device or groups of devices.

To manage devices, such as change device configuration, restart devices, manage updates, or view device and peripheral health, you need to be assigned one of the following Microsoft 365 admin roles:

- Microsoft 365 Global admin
- Teams Service admin
- Teams Device admin

For more information about admin roles in Teams, see Use Teams administrator roles to manage Teams.

What devices can you manage?

You can manage any device that's certified for, and enrolled in, Teams. A device is automatically enrolled the first time a user signs in to Teams on the device. For a list of certified devices that can be managed, see:

- Microsoft Teams Rooms
- Conference phones
- Desk phones
- Teams displays
- Collaboration bars

To manage devices, in the left navigation of the Microsoft Teams admin center, go to **Devices**, and then select the device type. Each type of device has its own respective section, which lets you manage them separately.

Manage Teams Rooms devices

You can use the Teams admin center to view and remotely manage your Teams Rooms devices across your organization. The Teams admin center makes it easy to see, at a glance, which devices are healthy and which need attention, and lets you focus on specific devices to see detailed information about device health, meeting performance, call quality, and peripherals.

Here are some things you can do to manage your Teams Rooms devices. Teams Rooms devices can be found in the Microsoft Teams admin center under **Devices** > **Teams Rooms**.

For details about how to manage your Teams Rooms devices, see Manage Microsoft Teams Rooms.

TO DO THIS...	DO THIS
Change settings on one or more devices	Select one or more devices > **Edit settings**. If you select multiple devices, the values you change will replace the values on all the selected devices.

TO DO THIS...	DO THIS
Restart devices	Select one or more devices > **Restart**. When you restart a device, you can choose whether to restart the device immediately or select **Schedule restart** to restart the device at a specific date and time. The date and time you select are local to the device being restarted.
View meeting activity	Select a device name to open device details > **Activity**. When you open the **Activity** tab, you can see all the meetings that the device has participated in. This summary view shows the meeting start time, the number of participants, its duration, and the overall call quality.
View meeting details	Select a device name to open device details > **Activity** > select a meeting. When you open a meeting's details, you can see all of the participants in the meeting, how long they were in the call, the Teams session types, and their individual call quality. If you want to see technical information about a participant's call, select the participant's call start time.

Manage phones, collaboration bars, and Teams displays

In the Teams admin center, you can view and manage phones, collaboration bars, and Teams displays enrolled in Teams in your organization. Information that you'll see for each device includes device name, manufacturer, model, user, status, action, last seen, and history. You can customize the view to show the information that fits your needs.

Phones, collaboration bars, and Teams displays are automatically enrolled in Microsoft Intune if you've signed up for it. After a device is enrolled, device compliance is confirmed and conditional access policies are applied to the device.

Here are some examples of how you can manage phones, collaboration bars,and Teams displays in your organization.

TO DO THIS...	DO THIS
Change device information	Select a device > **Edit**. You can edit details such as device name, asset tag, and add notes.
Manage software updates	Select a device > **Update**. You can view the list of software and firmware updates available for the device and choose the updates to install. For more information about updating devices, see Update Teams devices remotely
Upgrade Teams phones to Teams displays	On the **IP phones** page, select one or more Teams phones > **Upgrade**. This option is available only to phones that support upgrading to Teams displays. To learn more, see Upgrade Teams phones to Teams displays.
Assign or change configuration policies	Select one or more devices > **Assign configuration**.
Add or remove device tags	Select one or more devices > **Manage tags**. For more information about device tags, see Manage Teams device tags.
Restart devices	Select one or more devices > **Restart**.

TO DO THIS...	DO THIS
Filter devices using device tags	Select the filter icon, select the **Tag** field, specify a device tag to filter on, and select **Apply**. For more information about filtering devices using device tags, see Use filters to return devices with a specific tag.
View device history	Select a device > **History**. You can view the update history for the device.
View diagnostics	Select a device > **Diagnostics**.

Use configuration profiles in Teams

Use configuration profiles to manage settings and features for Teams phones and collaboration bars in your organization. You can create or upload configuration profiles to include settings and features you want to enable or disable and then assign a profile to a device or groups of devices.

Create a configuration profile

1. In the left navigation, go to **Devices** > **Configuration profiles**.
2. Click **Add**.
3. Enter a name for the profile and if you want, add a friendly description.
4. Specify the settings you want for the profile, and then click **Save**.

Assign a configuration profile

1. In the left navigation, go to **Devices** > **Configuration profiles**.
2. Select the **Configuration profile** you want to assign, and then click **Assign to device**.
3. In the **Assign devices to a configuration profile** pane, search for and select the devices you want to assign.
4. Click **Save**.

Update Microsoft Teams devices remotely

9/17/2020 • 3 minutes to read • Edit Online

Using the Microsoft Teams admin center, you can update your Teams devices, such as phones and collaboration bars, remotely, and you can choose device firmware automatic-update behavior. You can update the following on your devices using the Teams admin center:

- Teams app and teams admin agent
- Company portal app
- OEM agent app
- Device firmware

Device firmware updates can either be applied automatically or scheduled for a future date and time. Other available device updates aren't applied automatically, but can be applied manually or scheduled for a future date and time.

> **NOTE**
> While device firmware updates can be scheduled, if the scheduled date and time falls after the configured maximum 30 or 90 day delay, the firmware update is applied when the maximum delay is reached. The scheduled date and time are ignored. Additionally, updating Microsoft Teams devices remotely is a feature not yet available on US Government Cloud tenants (GCC-High).

To manage devices, you need to be a Global admin, Teams Service admin, or Teams Device admin. For more information about admin roles, see Use Microsoft Teams administrator roles to manage Teams.

Choose automatic device firmware update behavior

Device firmware updates are applied automatically. You can decide whether to apply updates as soon as one is released (if you choose this option, updates are applied on the first weekend after an update is released), or 30 or 90 days after an update is released. By default, device firmware updates are applied 30 days one released.

> **IMPORTANT**
> The latest firmware update release isn't applied on your Teams device. Instead, the update that's automatically applied on your device is delayed by one version. For example, assume your device has version "10" applied, and version "11" is released. Version "11" won't be applied yet. Instead your device will only be updated to version "11" after version "12" is released.

> **NOTE**
> Some devices don't support automatic firmware update yet. Applying automatic firmware update settings on devices that don't support automatic updates won't have any affect on those devices. For questions about whether your device will support automatic firmware updates, contact your device manufacturer.

To choose the automatic update behavior for your devices, do the following:

1. Sign in to Microsoft Teams admin center by visiting https://admin.teams.microsoft.com
2. Navigate **Devices** > **Phones** or **Collaboration bars**

3. Select one or more devices and then select **Update**
4. Under **Firmware auto-update**, select one of the following:
   - **As soon as available** Second-newest device firmware update is applied on the first weekend after the latest update is released.
   - **Defer 30 days** Second-newest device firmware update is applied 30 days after the latest update is released.
   - **Defer 90 days** Second-newest device firmware update is applied 90 days after the latest update is released.
5. Select **Update**

If, for whatever reason, you need to revert a device firmware update, you need to reset your device to its factory settings. Reset your device using the instructions from its manufacturer.

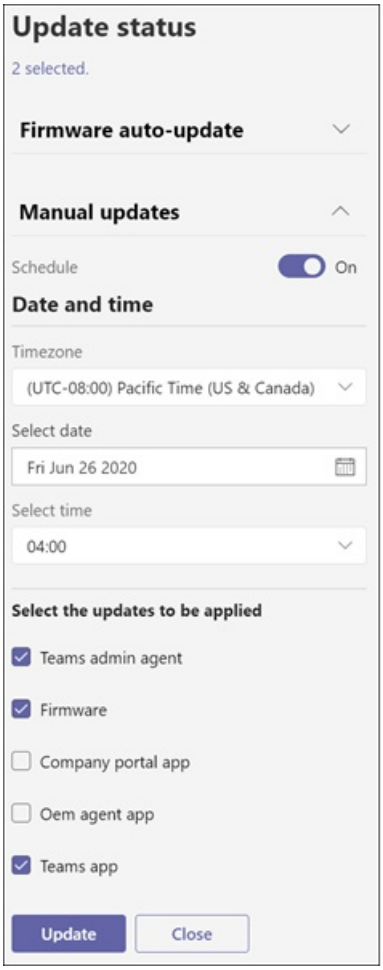
Manually update remote devices

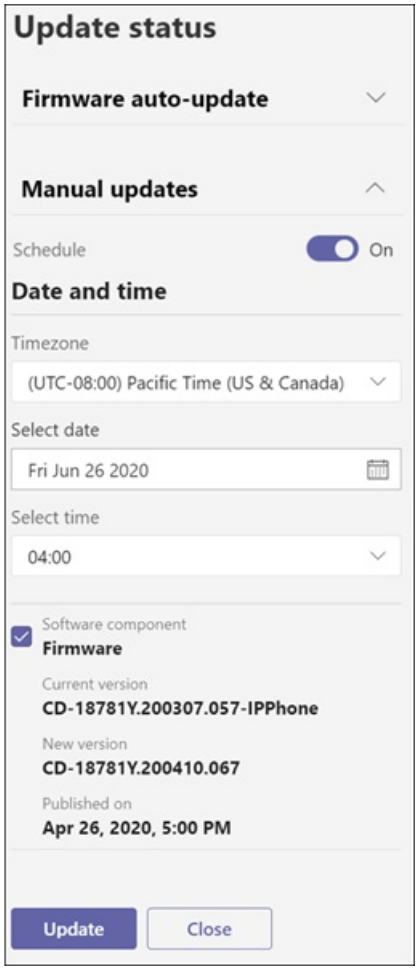
When you update one or more devices using the admin center, you can decide whether to update the devices immediately or schedule an update for a future date and time.

To manually update remote devices, do the following:

1. Sign in to Microsoft Teams admin center by visiting https://admin.teams.microsoft.com
2. Navigate **Devices** > **Phones** or **Collaboration bars**
3. Select one or more devices and then select **Update**
4. Under **Manual updates**, select **Schedule** if you want to schedule the update for a future date and time. The updates are applied at the date and time in the timezone selected in **Timezone**.

What you'll see depends on whether you have one, or multiple, devices selected. The left image below shows multiple devices selected while the image on the right shows a single device selected.





When you select multiple devices, you can choose which update types to apply to each selected device. Select the update types you want to apply and select **Update**.

When you select a single device, updates that are available for the device are shown. If multiple update types are available for the device, select each update type to apply. You can view the **Current version** applied on the device and the **New version** that will be applied. Select the update(s) you want to apply and select **Update**.

After you select **Update**, updates are applied to your devices at the date and time you selected if you scheduled an update. If you didn't select a future date and time, updates are applied to your devices within a few minutes.

Manage Microsoft Teams device tags

9/17/2020 • 5 minutes to read • Edit Online

Device tags in Microsoft Teams let you group, organize, and more easily manage the devices you've deployed in your organization. With the Microsoft Teams admin center, you can add one or more tags to devices, use filters to view devices that match the tag you specify, and then perform actions the devices that have that tag.

You can add a device tag to more than one device type. However, when you open a device pane in the admin center, only the devices of that type are returned. For example, you can assign the "Corporate" tag to both phones and Teams Rooms devices. If you search for the "Corporate" tag while in **Devices** > **Phones**, only phones are returned. Similarly, if you search for the "Corporate" tag in **Devices** > **Teams Rooms**, only Teams Rooms devices are returned.

To manage device tags, you need to be a Global admin, Teams Service admin, or Teams Device admin. For more information about admin roles, see Use Microsoft Teams administrator roles to manage Teams.

> **IMPORTANT**
>
> Device tags are assigned to the resource account that's logged into a device. If you sign a resource account out of one device and then use it to sign into another devices, the device tags are applied to new device.

Create, remove, or rename device tags

Using the device tag management panel, you can:

- See all your device tags.
- Create multiple device tags easily and then assign them to devices at a later time. Tags can be up to 25 characters.
- Remove device tags that are no longer needed. Before you can remove a device tag, you'll need to remove it from all of the devices it has been added to.
- Rename device tags. When you rename a device tag, that change is reflected on all the devices it's been added to. Tags can be up to 25 characters.

1. Sign in to Microsoft Teams admin center by visiting https://admin.teams.microsoft.com.
2. Navigate to **Devices** and then choose any device pane, such as **Phones**.
3. Select **Actions** in the upper-right corner of the page and select **All device tags**.
4. To create a device tag, select **+ Add**, provide a value for the device tag, and select the **Save** icon.
5. To remove a device tag, select the ellipsis **...** next to the device tag you want to remove, and select **Delete**.

   > **NOTE**
   >
   > If you try to remove a device tag that's been added to devices, you'll receive a message asking if you want to remove it from all devices. If you want to do this and continue to remove the device tag, select **Untag devices**.

6. To rename a device tag, select the ellipsis **...** next to the device tag you want to rename, and select **Edit**. Provide a new value for the device tag and select the **Save** icon.

Add or remove tags on a single device

When you add tags to a device, you can either select an existing tag or create a new one. Tags can be up to 25 characters.

1. Sign in to Microsoft Teams admin center by visiting https://admin.teams.microsoft.com.
2. Navigate to **Devices** and then choose the device pane that contains the device you want to add or remove tags on.
3. Place a check mark next to the device you want to add or remove tags on and select **Manage tags**.
4. If you want to add a tag:
   a. Start typing the tag name you want to add.
   b. If the tag already exists, select it from the list of tags that are returned.
   c. If the tag doesn't exist, select **Add "<tag name>" as a new tag**. Tags can be up to 25 characters.
5. If you want to remove a tag, select **X** next to the tag you want to remove.
6. Repeat the steps above if you want to add or remove more tags.
7. Select **Apply**.

Add or remove tags on multiple devices

When you add tags to a device, you can either select an existing tag or create a new one. Tags can be up to 25 characters. If you want to remove a tag from multiple devices, you need to select the Teams user that's associated with the device and remove the tag from the user.

1. Sign in to Microsoft Teams admin center by visiting https://admin.teams.microsoft.com.
2. Navigate to **Devices** and then choose the device pane that contains the devices you want to add or remove tags on.
3. Place a check mark next to the devices you want to add or remove tags on and select **Manage tags**.
4. If you want to add a tag:
   a. Start typing the tag name you want to add in **Manage tags for all devices of Teams users**.
   b. If the tag already exists, select it from the list of tags that are returned.
   c. If the tag doesn't exist, select **Add "<tag name>" as a new tag**.
5. If you want to remove a tag:
   a. Expand **Select Teams users**.
   b. Expand **<x> tags** under the name of the Teams user you want to remove tags from.
   c. Select **X** next to the tag you want to remove.
6. Repeat the steps above if you want to add or remove more tags.
7. Select **Apply**.

Use filters to return devices with a specific tag

If you've added device tags to your devices, you can use them to filter the device list to return only the devices that have had a specified tag added to them. This can be helpful if you just want to view all the devices in a specific room, all the devices of a certain type, or any other criteria you used when adding your tags. You can also perform bulk actions on returned devices, such as applying updates in waves, or setting different configuration policies depending on the groups of devices identified using device tags.

1. Sign in to Microsoft Teams admin center by visiting https://admin.teams.microsoft.com.
2. Navigate to **Devices** and then choose the device pane that contains the devices you want to filter.
3. Select the **Filter** icon.
4. If you only want to specify a single tag, or if you want to find devices that have all the tags you specify, select **Match all of these conditions**.
5. If you want to find devices that match one or more device tags, select **Match any one of these conditions**.
6. Select the **Tag** field and then specify a device tag name in the **Enter a value** field.

7. If you want to add more device tags, select **Add more** and repeat step 6 for each tag you want to add.
8. Select **Apply**.

After you've filtered the devices in your device list, you can perform actions on them as you normally would. For example, you can select them and then assign configurations, edit their settings (if they're Teams Rooms devices), and so on. When you're done, you can remove the filter by selecting the **X** next to the **Tag** filter entry or by selecting **Clear all** on the right side of the list.

Phones for Microsoft Teams

11/2/2020 • 3 minutes to read • Edit Online

Microsoft Teams supports a portfolio of desk phones for users who require a traditional phone experience. This article provides a complete overview of Teams phones and can help in planning, delivering, and managing Microsoft Teams phones as part of your Microsoft Phone System solution.

To deliver a high-quality and reliable Microsoft Teams experience on phones, we are partnering and actively working with Yealink, Crestron, Lenovo, Polycom, and Audiocodes to develop and certify a wide portfolio of desk phones and conference room audio devices. To get the latest and up-to-date information on Teams devices, go to Teams Marketplace.

To manage phones, you need to be a Global admin, Teams Service admin, or Teams Device admin. For more information about admin roles, see Use Microsoft Teams administrator roles to manage Teams.

Features supported by Teams phones

Teams-certified phones have a broad array of features to help your users do their jobs, and help you manage their use. Here's a summary of the features available in Teams-certified phones:

- **Authentication** Phones use Modern Authentication to simplify signing in and to improve security. Users can sign in by entering their username and password on the phone or by signing in from another device like PC/smartphone.
- **Speed dial and call history** Users have quick access to their contacts, call history, and voicemail. They can easily manage their contacts and speed dial entries directly from their phone.
- **Meetings and calls** Users can view their schedules and easily join meetings using Teams' one-touch join.
- **Call groups** Phone agents who participate in call groups can easily manage their availability and accept or decline incoming calls from the call queue.
- **User delegation** Executive assistants and admins can manage their executives' phones - intercept incoming calls; make calls on behalf of the executive; take over calls that the executive has placed on hold; and monitor whether the executive is on a call, on hold, and so on.
- **Hot desking** Users can get their contacts, meetings, and other preferences, just by signing into a phone. When they're done, they can sign out and leave the phone ready for the next user.
- **Video** Phones with video support let users join calls and video conferences just like they were at their computers. Users can keep their privacy by using a phone's camera shutter and microphone mute switch when available.
- **Better together** Phones can lock and unlock in an integrated fashion when connected to their Windows PC running a 64-bit Teams desktop client.
- **Accessibility** Phones have several accessibility features, such as high contrast text, to make it easier for anyone to use them.
- **Dynamic and enhanced E911 support** Signed-in users who call 911 will see their location on the phone.

  > **IMPORTANT**
  > If a phone isn't signed in, or if it doesn't have an Internet connection, 911 calls can't be placed. If this happens, a notification is displayed on the phone.

In addition to the above features, you can control what capabilities are available depending on the type of license and phone policy that are assigned to the user signing into the phone. For example, users who sign into a phone

with their personal accounts can access the full range of features - calling, meetings, voicemail, and so on. Accounts assigned a Common Area Phone license that sign into a phone, however, may only get access to a limited range of features; call history and meeting schedules may not be retained, for example, to protect users' privacy.

Required licenses

Teams licenses can be purchased as part of their Microsoft 365 and Office 365 subscriptions. To learn more about the required licenses for using Teams on phones, see available phone system licenses.

For more information about getting Teams, check out How do I get access to Microsoft Teams?

Deploy your phones using Intune

To learn more about how to deploy Teams displays using Intune, see Deploy Teams phones and Teams displays.

Manage your phones

Manage and keep your Teams phones up-to-date using the Microsoft Teams admin center. For more information, see Manage your devices in Teams.

Upgrade your phones to Teams displays

Microsoft Teams displays are a category of all-in-one dedicated Teams devices that feature an ambient touchscreen and a hands-free experience powered by Cortana. With Teams displays, users can use a microphone, camera, and speakers (or Bluetooth headset) for a reliable calling and meeting experience. Teams displays integrates with users' Windows PCs to bring a companion experience that allows for seamless cross-device interaction

You can upgrade Teams phones in your organization to Teams displays in the Microsoft Teams admin center. This option is available only to phones that support upgrading to Teams displays. To learn more, see Upgrade Teams phones to Teams displays.

See also

Teams Marketplace

IP phones certified for Microsoft Teams

Microsoft Teams displays

11/2/2020 • 2 minutes to read • Edit Online

Microsoft Teams displays are a category of all-in-one dedicated Teams devices that feature an ambient touchscreen and a hands-free experience powered by Cortana. This article provides an overview of Teams displays and can help you plan, deliver, and manage Teams displays in your organization.

Teams displays brings together your favorite Teams features–chat, meetings, calls, calendar, and files–into a single device. With Teams displays, users can use a microphone, camera, and speakers (or Bluetooth headset) for a reliable calling and meeting experience. Teams displays integrates with users' Windows PCs to bring a companion experience that allows for seamless cross-device interaction.

To learn more, check out Get started with Teams displays.

Features supported by Teams displays

In addition to the features supported by Teams phones, the following features are unique to Teams displays:

- **Dedicated displays for Teams** Users can access all core Teams features including chat, meetings, calls, teams and channels, files and more.
- **Ambient experience** Users can easily stay on top of their work with always-on and glanceable displays to see important activities and notifications without context-switching on their primary work device. Users can also personalize Teams displays by customizing the background through settings.
- **Hands-free with Cortana** Users can interact with Teams displays using their voice to effortlessly join and present in meetings, dictate replies to a Teams chat, check what's on the calendar, and more.
- **Leave a note on lock screen** Guests can choose to leave audio, video, and text notes, and users can check the notes left by guests and see who's stopped by.

Required licenses

Teams licenses can be purchased as part of Microsoft 365 and Office 365 subscriptions. To learn more about the required licenses to use Teams displays, see Voice and video calling with Microsoft Teams.

For more information about how to get Teams, check out How do I get access to Microsoft Teams?

Deploy Teams displays using Intune

To learn more about how to deploy Teams displays using Intune, see Deploy Teams phones and Teams displays.

Manage Teams displays in your organization

To manage your Teams display devices, in the left navigation of the Microsoft Teams admin center, go to **Teams displays**. From here, you can change the device configuration profile, manage updates, restart devices, add and remove device tags, and more. For more information, see Manage your devices in Teams.

Upgrade Teams phones to Teams displays

Teams displays is the evolution of Teams phones. You can upgrade Teams phones in your organization to Teams displays using the Microsoft Teams admin center. This option is available only to phones that support upgrading to Teams displays. To learn more, see Upgrade Teams phones to Teams displays.

See also

Introducing Microsoft Teams displays

Teams Marketplace

Phones for Teams

IP Phones certified for Microsoft Teams

Upgrade IP phones to Teams displays

Cortana voice assistance in Teams

Upgrade Teams phones to Teams displays

11/2/2020 • 3 minutes to read • Edit Online

> **IMPORTANT**
> Upgrading to Teams displays is available only on Lenovo ThinkSmart View devices. The information in this article applies only to this device model.

This article gives you an overview of how to upgrade your Teams phones to Teams display devices in the Microsoft Teams admin center. Doing this allows the devices to provide a rich experience for your users as Teams display devices.

Teams displays are a category of all-in-one dedicated Teams devices with an ambient touchscreen and a hands-free experience powered by Cortana. Teams displays are the evolution of Teams phones. In addition to features supported by Teams phones, Teams displays include features such as an always-on display in which all Teams activity and collaboration options are always available. To learn more about features unique to Teams displays, see Microsoft Teams displays.

What you need to know about upgrading to Teams displays

Which Teams phones can be upgraded?

Lenovo ThinkSmart View devices can be upgraded to Teams displays.

How can I prepare users?

To get your users ready, share Get started with Teams displays with your users to help them get familiar with using Teams displays. We recommend you do this well in advance of the upgrade.

Let them know that there's no changes to their data or preferences after the upgrade. For example, users can access all their meetings, missed calls, and voicemails in Teams displays.

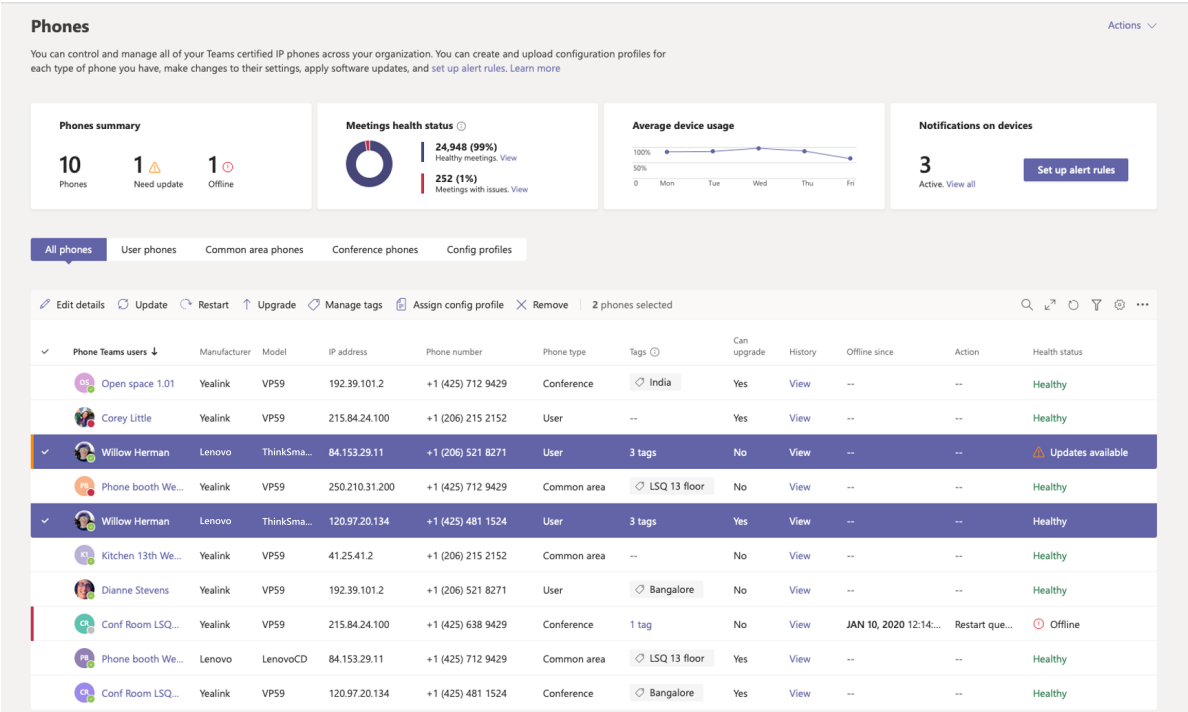
What happens after the upgrade?

After you upgrade a Teams phone to a Teams display device, the device is listed on the **Teams displays** page in the **Devices** section of the Microsoft Teams admin center. You manage it in the same way that you manage any other Teams device. To learn more, see Manage your devices in Teams.

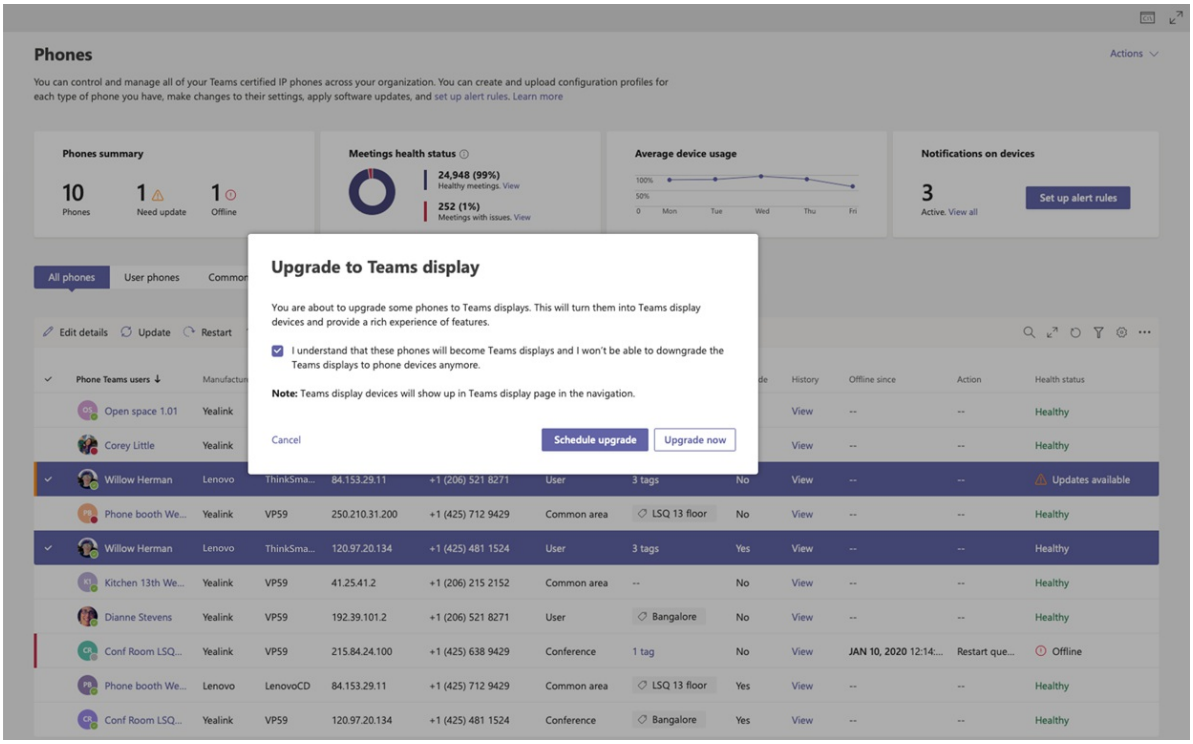
Keep in mind that after you upgrade a Teams phone to a Teams display device, the action can't be reversed. We recommend you first run a pilot with a group of early adopters before you upgrade your entire organization.

Upgrade your Teams phones to Teams displays

1. In the left navigation of the Microsoft Teams admin center, go to **Devices** > **Phones**.
2. Select the Teams phones you want to upgrade, and then select **Upgrade**.



3. In the **Upgrade to Teams display** dialogue box, select **Schedule upgrade** to set a date and time for the upgrade or **Upgrade now**.



> **NOTE**
>
> If you receive a message that says your selected phones can't be upgraded, check to make sure that you select phones that support the upgrade, and then try again.

During the upgrade process, the device's firmware is updated to a Teams display device, the device restarts, and is ready for use. When the upgrade is completed, you'll see the device listed on the **Teams displays** page in the Microsoft Teams admin center.

It can take up to an hour for the upgrade to complete. If the process hasn't completed after an hour, retry the upgrade. You can also go to the **History** tab of the device details page to see the status.

Known issues

Teams displays have the Default theme instead of the Dark theme

Dark theme support on Teams displays will be available in a future update. Teams phones that use the Dark theme will get the Default theme after the upgrade to Teams displays.

Some apps are missing from the Home screen

If certain apps are missing from the Home screen after the upgrade, sign out and sign in again. The fix for this will be available in a future update.

See also

Introducing Microsoft Teams displays

Teams displays

Teams Marketplace

Phones for Teams

IP Phones certified for Microsoft Teams

Cortana voice assistance in Teams

Deploy Teams phones and Teams displays using Intune

11/2/2020 • 2 minutes to read • Edit Online

This article gives you an overview of how to deploy Teams phones and Teams displays using Intune.

Conditional Access

Conditional Access is an Azure Active Directory (Azure AD) feature that helps you to ensure devices accessing your Office 365 resources are properly managed and are secure. If you apply Conditional Access policies to the Teams service, Android devices (including Teams phones and Teams displays) that access Teams need to be enrolled into Intune and their settings need to comply with your policies. If the device isn't enrolled into Intune, or if it's enrolled but its settings don't comply with your policies, Conditional Access will prevent a user from signing in to or using the Teams app on the device.

Typically, compliance policies defined within Intune are assigned to groups of users. This means that if you assign an Android compliance policy to user@contoso.com, that policy will apply equally to their Android smartphone and to any Android-based Teams device that user@contoso.com signs into.

If you use Conditional Access, which requires Intune enrollment to be enforced, in your organization, there are a couple things you need to set up to allow for a successful Intune enrollment:

- **Intune license** The user signing into the Teams device must be licensed for Intune. As long as the Teams device are signed in to a user account that has a valid Intune license, the device will automatically be enrolled in Microsoft Intune as part of the sign-in process.
- **Configure Intune** You must have a properly configured Intune tenant set up for Android Device Administrator enrollment.

Configure Intune to enroll Teams Android-based devices

Teams Android-based devices are managed by in Intune via Android Device Administrator (DA) management. Before devices can be enrolled into Intune, there are a few basic steps to perform. If you are already managing devices with Intune today, you probably have already done all these things. If not, here's what to do:

1. Set Intune MDM (mobile device management) Authority. If you're never used Intune before, you need to set the MDM authority before you can enroll devices. For more information, see Set the mobile device management authority. This is a one-time step that has to be done upon creating a new Intune tenant.
2. Enable Android device administrator enrollment. Android-based Teams device are managed as device administrator devices with Intune. Device administrator enrollment is off by default for newly created tenants. For more information, see Android device administrator enrollment.
3. Assign licenses to users. Users of Teams devices enrolling to Intune must be assigned a valid Intune license. For more information, see Assign licenses to users so they can enroll devices in Intune.
4. Assign Device Administrator compliance policies. Create an Android Device Administrator compliance policy and assign it to the Azure Active Directory group that contains the users that will be signing into the Teams devices. For more information, see Use compliance policies to set rules for devices you manage with Intune.

See also

Phones for Teams

IP Phones certified for Microsoft Teams

Teams displays

Manage your devices in Teams

Teams Marketplace

USB audio and video devices certified for Microsoft Teams

11/2/2020 • 7 minutes to read • Edit Online

The peripherals certification program ensures that USB peripherals such as headsets, speakerphones, webcams, and monitors, offer rich audio or video quality. Certified devices work out of the box (plug & play) with no additional configuration required, and offer call control with Microsoft Teams and Skype for Business. The products provide a great experience for end-users and administrators.

To explore devices tested and certified for Microsoft Teams, head over to the Teams store.

For more details on call control support with Teams, please read control calls using a headset in Teams.

> **TIP**
> Looking for devices certified for Skype for Business? Head over to USB audio and video devices certified for Skype for Business.

Understanding certification categories

Users don't need to replace previously certified devices when upgrading to Teams from Skype for Business. All certified devices are supported for both Microsoft Teams users and for Skype for Business users, with a few differences in functionality. Additionally certification provides further designation for certain device categories.

- **Skype for Business certified with Teams upgrade** Devices certified at this level were initially certified for Skype for Business. To deliver as much lifetime value to users as possible, Microsoft has worked with device manufacturers to deliver as much Teams integration as possible with these existing devices without any changes to the original hardware. The *hookswitch* button acts as a Teams button when not in a call, and may include additional functions over time. Devices in this category may carry the Teams certification badge on marketing materials.
- **Certified for Microsoft Teams** Devices certified at this level indicate the newest devices certified, for a no-compromise Teams experience. These devices offer all of the benefits of prior certification and also include a dedicated Teams button with LED indicator. With most form factors, the Teams button will be an easy-to-find tactile button with the Teams logo. Microsoft continues to work with device manufacturers to deliver new value via firmware updates over time.

Special usage designations

- **Premium Microphone for Open Office** All headsets are tested to provide clear audio, but open office and other noisy environments fulfill a greater challenge: to pick up clearly the voice of the headset user but not transmit the sound of their neighbors.
- **Meeting room size** Shared devices such as speakerphones and cameras have a supported usage distance and recommended distances may be reported differently by different manufacturers. To give customers clear guidance, all shared devices are tested at certification against well-defined rooms sizes and noise environments.

Browse devices certified for Microsoft Teams.

End-user experience

New Teams certification benefits

- Dedicated Teams button and LED indicator light.
- User notification of events and alerts from the Teams client (e.g., meeting starting, voicemail or missed call).
- Ability to activate the Teams client or respond to notification with a press of the button (e.g., to join a meeting).
- Certification designed for extensibility (new device/client features to be delivered via firmware update).

Core certification benefits

- Automatic selection of default audio device and prioritization if multiple audio peripherals are present.
- Devices automatically register with the Teams client and are ready to use.
- Audio devices (e.g., headsets, and speakerphones) offer:
  - Basic call control across when used with a PC or a Mac devices. Basic controls include answer/hang-up, mute/unmute, and volume control.
  - Wide-band audio with no echo, distortion, or excessive glitches. Echo cancellation is also supported across devices.
- Video devices meet requirements for noise, color, image detail, jitter, latency, frame rate, and field of view.

Administrator Experience

- No provisioning required
- All devices support firmware updates to allow new features and performance improvements.

If you are a manufacturer and want to join the certification program, see How to Join for requirements and available programs.

Certified devices

Table Updated October 2020

MANUFACTURER	MODEL	QUALIFIED	CERTIFIED PROGRAM
EPOS/Sennheiser	MB Pro 1	10/2/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	MB Pro 2	10/2/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Evolve 80 Headset	8/23/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Evolve 40 Headset	8/23/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Evolve 30 II Headset	8/23/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Evolve 20 Headset	8/23/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 660 with USB-ED CC 01 MS connecto	8/20/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 630 with USB-ED CC 01 MS connecto	8/20/2020	Skype for Business with upgrade to Microsoft Teams

MANUFACTURER	MODEL	QUALIFIED	CERTIFIED PROGRAM
EPOS/Sennheiser	Impact SC 260 with USB-ED CC 01 MS connecto	8/20/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Evolve 75 Headset	7/31/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Evolve 65 Headset	7/31/2020	Skype for Business with upgrade to Microsoft Teams
Jabra	Engage 50 Headset	7/31/2020	Skype for Business with upgrade to Microsoft Teams
Avocor	WCD- AVW-6555	7/30/2020	Certified for Microsoft Teams
Jabra	Evolve2 85 Headset	7/17/2020	Certified for Microsoft Teams
Bose	NC 700 Headset	6/8/2020	Certified for Microsoft Teams
Jabra	Speak 750 speakerphone with Jabra Link 370 USB Dongle	5/21/2020	Certified for Microsoft Teams
EPOS	Sennheiser Adapt 660 headset	5/15/2020	Certified for Microsoft Teams
EPOS	Sennheiser Adapt 560 Headset	5/15/2020	Certified for Microsoft Teams
EPOS	Sennheiser Adapt 460T headset	5/15/2020	Certified for Microsoft Teams
EPOS	Sennheiser Adapt 360 headset	5/15/2020	Certified for Microsoft Teams
Yealink	UH36 headset	5/13/2020	Certified for Microsoft Teams
Poly	Savi 8210 Office	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Savi 8210 UC	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Savi 8220 Office	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Savi 8220 UC	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Savi 8240 Office	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Savi 8240 UC	4/20/2020	Skype for Business with upgrade to Microsoft Teams

MANUFACTURER	MODEL	QUALIFIED	CERTIFIED PROGRAM
Poly	Savi 8245 Office	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Savi 8245 UC	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Blackwire 5210 Headset	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Blackwire 5220 Headset	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Blackwire 7225 Headset	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Voyager Focus UC	4/20/2020	Skype for Business with upgrade to Microsoft Teams
Yealink	CP700	4/13/2020	Certified for Microsoft Teams
Jabra	Evolve2 65 Headset	4/13/2020	Certified for Microsoft Teams
EPOS/Sennheiser	Impact SC 30	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 45	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 60	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 75 MS	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 75 MS EUL	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 230 USB MS II	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 260 USB MS II	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 630 USB MS	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 635 USB	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 660 USB MS	4/9/2020	Skype for Business with upgrade to Microsoft Teams

MANUFACTURER	MODEL	QUALIFIED	CERTIFIED PROGRAM
EPOS/Sennheiser	Impact SC 660 ANC USB	4/9/2020	Skype for Business with upgrade to Microsoft Teams
EPOS/Sennheiser	Impact SC 665 USB	4/9/2020	Skype for Business with upgrade to Microsoft Teams
Logitech	Zone Wireless	4/8/2020	Certified for Microsoft Teams
Poly	Voyager 8200 Headset	3/26/2020	Skype for Business with upgrade to Microsoft Teams
Logitech	Zone Wired	3/26/2020	Certified for Microsoft Teams
Jabra	Evolve2 40 Headset	3/26/2020	Certified for Microsoft Teams
Poly	Voyager 6200 Headset	3/23/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Voyager 4245 Office	3/23/2020	Certified for Microsoft Teams
Poly	Blackwire 8225 Headset	3/23/2020	Certified for Microsoft Teams
Poly	Calisto 5300-M	03/05/2020	Certified for Microsoft Teams
Poly	Voyager 4210 Office	03/05/2020	Certified for Microsoft Teams
Poly	Voyager 4210 UC	03/05/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Voyager 4220 Office	03/05/2020	Certified for Microsoft Teams
Poly	Voyager 4220 UC	03/05/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Voyager 5200 Office	03/05/2020	Certified for Microsoft Teams
Poly	Voyager 5200 UC	03/05/2020	Skype for Business with upgrade to Microsoft Teams
Poly	Blackwire 3310-M	03/05/2020	Certified for Microsoft Teams
Poly	Blackwire 3315-M	03/03/2020	Certified for Microsoft Teams
Poly	Blackwire 3320-M	03/05/2020	Certified for Microsoft Teams
poly	Blackwire 3325-M	03/05/2020	Certified for Microsoft Teams
Poly	Calisto 3200-M	01/27/2020	Certified for Microsoft Teams
Crestron	CCS-UCA-MIC	12/18/2019	Certified for Microsoft Teams

MANUFACTURER	MODEL	QUALIFIED	CERTIFIED PROGRAM
Sennheiser	SP 30T	12/05/2019	Certified for Microsoft Teams
Polycom	Elara	11/06/2019	Certified for Microsoft Teams
Polycom	Studio Soundbar	10/18/2019	Certified for Microsoft Teams
Yealink	UVC30	10/18/2019	Certified for Microsoft Teams
Jabra	PanaCast	08/14/2019	Certified for Microsoft Teams

Deploy collaboration bars for Microsoft Teams

9/17/2020 • 5 minutes to read • Edit Online

Deployment of collaboration bars for Microsoft Teams can be broken down into the following phases:

- **Site readiness** Confirm that your deployment locations (rooms) meet the deployment requirements.
- **Service readiness** Create resource accounts and assign them to the devices (see Create a resource account using the Microsoft 365 admin center). While we recommend using a dedicated room license, a properly licensed end user account can also sign in to collaboration bars.
- **Configuration and deployment** Set up collaboration bars in rooms and connect the peripheral devices you need (see the manufacturer's documentation for your collaboration bars).

To manage collaboration bars, you need to be a Global admin, Teams Service admin, or Teams Device admin. For more information about admin roles, see Use Microsoft Teams administrator roles to manage Teams.

Site readiness

While the ordered devices are being delivered to your organization, work with your networking, facilities, and audio-visual teams to make sure that deployment requirements are met and each site and room is ready in terms of power, networking, and display.

Our recommendations for collaboration bar sites are:

- Rooms up to 4 people in size
- Dedicated resource accounts
- Touch-enabled displays
- Ethernet cabling
- Quality of Service (QoS) enabled on the network for Microsoft Teams media

For physical installation considerations, see the manufacturer's documentation and, if you have one, leverage the experience of your audio-visual team before you install and mount screens and run cabling.

> **TIP**
>
> Be sure to check out Prepare your network for Teams for bandwidth planning and assessing your network's suitability for real-time traffic.
>
> We don't recommend placing proxy servers between Teams devices and the Internet. For more information about proxy servers and Teams, check out Proxy servers for Teams.

Decision points	• Confirm that your sites meet the site readiness requirements for collaboration bars for Microsoft Teams. • Confirm that you've provided sufficient bandwidth for each site.
Next steps	• Start to plan your collaboration bar deployment and configuration.

Service readiness

Before you deploy your collaboration bars, you need to decide if they'll use Microsoft 365 resource accounts, end-user accounts, or a mixture of both. Microsoft 365 resource accounts are mailbox and Teams accounts that are dedicated to specific resources, such as a room, projector, and so on. These resource accounts can automatically respond to meeting invites using rules you define when they're created. Unless a collaboration bar is dedicated to a specific individual for their private use, we recommend setting up a Microsoft 365 resource account for it.

Using a resource account

If you decide to set up a Microsoft 365 resource account, you'll need to purchase a Meeting Room license for it. The Meeting Room license includes a resource mailbox that enables people in your organization to book the meeting room via Outlook or Teams. The license also enables video and audio conferencing and screen sharing among meeting participants.

If you need to receive or make calls to or from an external telephone number, you may need a Calling Plan or Microsoft 365 Business Voice add-on license. If you have Direct Routing enabled in your organization, you only need the Meeting Room SKU.

When you create a resource account, you can choose whether to let the account automatically accept or decline meeting requests, allow recurring meetings, specify how far in advance people can book the resource, and so on.

> **IMPORTANT**
>
> Microsoft 365 resource accounts aren't the same as Teams resource accounts. Teams resource accounts can be used with call queues and auto attendants to accept phone calls from external phone numbers. Microsoft 365 resource accounts are tied to an Exchange Online mailbox and enable booking of shared resources, such as rooms, projectors, and so on.
>
> If you want to know more about Teams resource accounts, see Manage resources accounts in Microsoft Teams.

For more information about collaboration bars for Microsoft 365 resource accounts, see Create a resource account using the Microsoft 365 admin center.

Decision points	• Decide whether you want to make or receive external phone calls and identify licensing requirements for your resource accounts.
Next steps	• Prepare resource accounts.

Configuration and deployment

Planning for configuration and deployment covers the following key areas:

- Resource account provisioning
- Device deployment
- Collaboration bars for Microsoft Teams application and peripheral device configuration
- Testing
- Asset management

Account provisioning

If you plan on using Microsoft 365 resource accounts to let users book collaboration bars, follow the instructions in Create a resource account using the Microsoft 365 admin center to create a Microsoft 365 resource account for

each collaboration bar that needs one. This is also where you'll need to add a Meeting Room license to the resource account and, if you want to make or receive calls to or from external phone numbers, a Calling Plan or Business Voice license if your organization is not using Direct Routing.

If you want to assign collaboration bars to individual users for their private use, you don't need to set up any additional accounts. Users can sign into collaboration bars using their personal accounts.

> **TIP**
> Make the display names for your Microsoft 365 resource accounts descriptive and easy to understand. These are the names that users will see when searching for and adding collaboration bars for Microsoft Teams to meetings. You could use a convention like *Site-Room Name(Max Room Capacity)*, so for example Curie, a 4-person meeting room in London, might have the display name LON-CURIE(4).

Decision points	• Decide the naming convention for your dedicated resource accounts. • Decide whether you'll create individual accounts or use bulk-provisioning scripts.
Next steps	• Start to plan your device deployment.

Device deployment

Next, you need to create your plan to deliver the devices and their assigned peripheral devices to your rooms, and then proceed with installation and configuration.

Decision points	• Decide who will manage the site-by-site deployment. • Identify the resources who will install the collaboration bars for Microsoft Teams on site and undertake the configuration and testing.
Next steps	• Start device testing.

Testing

After the collaboration bars for Microsoft Teams have been deployed, you should test them. Sign in to the device and check that the expected capabilities are working on the deployed device. We highly recommend that you verify that the devices are appearing in the **Collaboration bars** section under the **Devices** tab of Microsoft Teams admin center. It's also important that you make a number of test calls and meetings to check quality and performance.

We recommend that as part of the general Microsoft Teams rollout, you configure building files for Call Quality Dashboard (CQD), monitor quality trends, and engage in the Quality of Experience Review process. For more information, see the Quality of Experience Review Guide.

Asset management

As part of the deployment, you'll want to update your asset register with the room name, signed-in resource account, and assigned peripheral devices.

Related topics

Configure accounts for collaboration bars for Microsoft Teams using Microsoft Teams admin center

IP Phones certified for Microsoft Teams

12/5/2020 • 4 minutes to read • Edit Online

The IP Phones certification program ensures that customers using certified desk phones and conference phones will experience high quality audio calls and meetings experience.

Announcing Certified for Microsoft Teams

In addition to offering customers a range of Skype for Business certified IP phones, as part of the Teams IP phone certification program, we are announcing the availability of new IP phone hardware that will be certified for Microsoft Teams. This certification program ensures a higher quality bar with higher performance targets and audio quality metrics. Phone vendors are actively working to meet this higher bar and will be qualifying against the new requirements this calendar year. Some of our partners are also working to provide support for the Skype for Business service on the same hardware as the Teams IP phones. Benefits from the Teams certified IP phone include:

- Native Teams experience with hardware button integration and LED notifications
- Calendar integration and one-touch meeting join
- Deployed and managed via the Microsoft Device Management Solution with Intune integration

Currently certified IP Phones

The following phones are Certified for Microsoft Teams:

PHONE MODEL	FIRMWARE VERSION	RELEASE DATE
Audiocodes C450HD	C450HD_TEAMS_0.225	March 2019
Audiocodes C448HD (CAP mode only)	C450HD_TEAMS_0.225	March 2019
Crestron UC-2	1.0.1.46	July 2020
Crestron M100	This product has been discontinued. For more information, visit Crestron M100 on Crestron's website.	Discontinued as of 5/11/2020
Crestron Flex UC-P100-T & UC-P110-T	This product has been discontinued. For more information, visit UC Phone on Crestron's website.	Discontinued as of 5/11/2020
Lenovo ThinkSmart View	CD-18781Y.200410.067	April 2020
Poly Trio C60	5.9.3.6155	April 2020
Poly CCX400	1.0.0.0200	January 2020
Poly CCX600	5.9.12.1122	January 2020
Poly CCX500	5.9.12.1122	December 2019

PHONE MODEL	FIRMWARE VERSION	RELEASE DATE
Poly Trio 8500/8800 (shared mode only)	5.9.0.10869	June 2019
Yealink MP54	122.15.0.27	November 2020
Yealink MP56	122.15.0.6	March 2020
Yealink VP59	91.15.0.16	June 2019
Yealink T55	58.15.0.36	May 2019
Yealink CP 960	73.15.0.20	December 2018
Yealink T58 & T56 series	58.15.0.20	December 2018

Currently certified Collaboration Bars

The following Collaboration Bars are Certified for Microsoft Teams:

COLLABORATION BAR MODEL	FIRMWARE VERSION	RELEASE DATE	ROOM SIZE (UP TO)
Yealink MeetingBar A20	133.15.0.19	November 2020	Focus room(3m x 3m) Small meeting room(4.5m x 4.5m)
Poly Studio X30	3.1.1.216109	June 2020	Focus room(3m x 3m) Small meeting room(4.5m x 4.5m)
Poly Studio X50	3.1.1.216109	June 2020	Focus room(3m x 3m) Small meeting room(4.5m x 4.5m)
Yealink VC210	118.15.0.14	February 2020	Focus room(3m x 3m) Small meeting room(4.5m x 4.5m)

Currently certified Teams display

The following Teams displays are Certified for Microsoft Teams:

TEAMS DISPLAY MODEL	FIRMWARE VERSION	RELEASE DATE
Lenovo ThinkSmart View	CD-18781Y.201006.099	October 2020

Product release information for Teams Phones

The following are the latest Teams IP phone app and firmware versions.

App versions

PRODUCT RELEASE	RELEASE DATE	MICROSOFT TEAMS APP VERSION	COMPANY PORTAL VERSION	ADMIN AGENT VERSION
Update #6	October 12, 2020	1449/1.0.94.2020091801	5.0.4912.0	1.0.0.202006290446.product(216)
Update #5	August 31, 2020	1449/1.0.94.2020071702	5.0.4867.0	1.0.0.202006290446.product(216)
Update #4	June 30, 2020	1449/1.0.94.2020051601	5.0.4771.0	1.0.0.202005060552
Update #3	May 13, 2020	1449/1.0.94.2020040801	5.0.4715.0	1.210

Firmware versions

When you install a new firmware version on your device, you can determine the corresponding Microsoft Teams app, Company Portal, and Admin Agent, versions that are installed by finding the product release in the **Included product release** column. Then look up the product release in the **App versions** table above.

DEVICE MODEL	FIRMWARE VERSION	YEAR/INCLUDED PRODUCT RELEASE
AudioCodes C448HD	C450HD_TEAMS_1.7.9	2020, Update #6
AudioCodes C450HD	C450HD_TEAMS_1.7.9	2020, Update #6
Lenovo ThinkSmart View	CD-18781Y.200922.098	2020, Update #6
Poly CCX400	6.2.22.0185	2020, Update #6
Poly CCX500/CCX600	6.2.22.0185	2020, Update #6
Poly Trio C60	5.9.5.2983	2020, Update #6
Yealink T55/T56/T58	58.15.0.116	2020, Update #6
Yealink MP56	122.15.0.23	2020, Update #6
Yealink VP59	91.15.0.48	2020, Update #6
Yealink CP960	73.15.0.109	2020, Update #6

Product release information for Collaboration Bars

The following are the latest Teams Collaboration Bar app and firmware versions.

App versions

PRODUCT RELEASE	RELEASE DATE	MICROSOFT TEAMS APP VERSION	COMPANY PORTAL VERSION	ADMIN AGENT VERSION
Update #3	November 24, 2020	1449/1.0.94.2020102101	5.0.4927.0	1.0.0.202006290446.product versioncode: 216

PRODUCT RELEASE	RELEASE DATE	MICROSOFT TEAMS APP VERSION	COMPANY PORTAL VERSION	ADMIN AGENT VERSION
Update #2	August 24, 2020	1449/1.0.94.2020062501	5.0.4771.0	1.0.0.202005060552. product versioncode: 212
Update #1	May 13, 2020	.040901	.4715	.210

Firmware versions

When you install a new firmware version on your device, you can determine the corresponding Microsoft Teams app, Company Portal, and Admin Agent, versions that are installed by finding the product release in the **Included product release** column. Then look up the product release in the **App versions** table above.

DEVICE MODEL	FIRMWARE VERSION	YEAR/ INCLUDED PRODUCT RELEASE
Yealink VC210 + CP900	118.15.0.42	2020, Update #3
Poly Studio X30	3.2.3.280012	2020, Update #3
Poly Studio X50	3.2.3.280012	2020, Update #3

Product release information for Teams display

The following are the latest Teams display app and firmware versions.

App versions

PRODUCT RELEASE	RELEASE DATE	MICROSOFT TEAMS APP VERSION	COMPANY PORTAL VERSION	ADMIN AGENT VERSION
Update #1	October 22, 2020	1449/1.0.95.2020092307	5.0.4927.0	1.0.0.202006290446. product

Firmware versions

When you install a new firmware version on your device, you can determine the corresponding Microsoft Teams app, Company Portal, and Admin Agent, versions that are installed by finding the product release in the **Included product release** column. Then look up the product release in the **App versions** table above.

DEVICE MODEL	FIRMWARE VERSION	YEAR/ INCLUDED PRODUCT RELEASE
Lenovo ThinkSmart View	CD-18781Y.201006.099	2020, Update #1

See Microsoft Teams phones feature set for information on features supported by these devices.

See Finding the Firmware version on a mobile device to determine the device firmware version on your mobile device.

Microsoft Teams licenses can be purchased as part of their Microsoft 365 or Office 365 subscriptions. To learn more about the required licenses for using Microsoft Teams on phones, see available phone system licenses.

For more information about getting Teams, check out How do I get access to Microsoft Teams?

If you are a vendor seeking to join the certification program, see How to Join for requirements and available programs.

Additional resources

Learn about Skype for Business and Microsoft Teams certification programs.

Explore Microsoft Teams phones and certified devices.

Teams and Skype interoperability

Microsoft Teams PowerShell Overview

12/5/2020 • 2 minutes to read • Edit Online

Microsoft Teams PowerShell is a set of cmdlets for managing Teams directly from the PowerShell command line. Written in .NET Standard, Teams PowerShell works on PowerShell 5.1 on Windows, PowerShell 6.x and higher on all platforms including Azure Cloud Shell.

Before you can start using PowerShell, you'll need to install it.

> **WARNING**
> There are known issues with PowerShell 7 and Teams PowerShell. We recommend using PowerShell 5.1 until the issues are resolved.

Releases

Teams PowerShell is available on PowerShell Gallery in two release types.

- **General Availability (GA)**: Production-ready cmdlets, updated monthly.
- **Public Preview**: Early access to features. May be updated more frequently than GA.

For detailed information on feature additions and improvements for both releases, read the Teams PowerShell release notes.

Manage Teams with PowerShell

You'll use Teams PowerShell modules to fully manage Teams:

- Microsoft Teams PowerShell module: The Teams PowerShell module contains cmdlets for managing teams, chat, and channels.

> **NOTE**
> The latest Teams PowerShell public release is integrated with Skype for Business Online Connector, providing a single module for Teams PowerShell management.

- Skype for Business PowerShell Connector: The Skype for Business PowerShell connector is now a part of Teams PowerShell module.

For a complete guide to managing Teams using these modules, please see Manage Teams with Teams PowerShell.

Related topics

Installing Teams PowerShell

Managing Teams with Teams PowerShell

Teams PowerShell Release Notes

Microsoft Teams cmdlet reference

Skype for Business cmdlet reference

Use Microsoft Teams admin roles to manage Teams

Install Microsoft Teams PowerShell

9/15/2020 • 3 minutes to read • Edit Online

This article explains how to install the Microsoft Teams PowerShell module using PowerShellGet. These instructions work on Azure Cloud Shell, Linux, macOS, and Windows platforms.

Requirements

Teams PowerShell requires PowerShell 5.1 or higher on all platforms. Install the latest version of PowerShell available for your operating system.

> **WARNING**
> There are known issues with PowerShell 7 and Teams PowerShell. For the best experience, we recommend that you use PowerShell 5.1.

Install the Teams PowerShell module

> **NOTE**
> For the best experience, use either General Availability (GA) or Public Preview modules - not both. They're not intended to work together.

Use the **PowerShellGet** cmdlets to install the Teams PowerShell module. Installing the module for all users on a system requires elevated privileges. Start the PowerShell session using **Run as administrator** in Windows or use the `sudo` command on macOS or Linux:

```
Install-Module MicrosoftTeams
```

By default, the PowerShell Gallery (PSGallery) isn't configured as a trusted repository for **PowerShellGet**. The first time you use the PSGallery, you'll see the following message:

```
Untrusted repository

You are installing the modules from an untrusted repository. If you trust this repository, change
its InstallationPolicy value by running the `Set-PSRepository` cmdlet.

Are you sure you want to install the modules from 'PSGallery'?
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is "N"):
```

Answer **Yes** or **Yes to All** to continue with the installation.

Install Teams PowerShell public preview

> **NOTE**
> If you're using the Public Preview version of Teams PowerShell, we strongly recommend that you first uninstall Skype for Business Online Connector.

Installing the Teams PowerShell public preview module for all users on a system requires elevated privileges. Start the PowerShell session using **Run as administrator** in Windows or use the `sudo` command on macOS or Linux.

If you're using PowerShell 5.1, you must update the **PowerShellGet** module beforehand. After you update **PowerShellGet**, close and reopen an elevated PowerShell session to ensure that the latest **PowerShellGet** is loaded.

```
Install-Module PowerShellGet -Force -AllowClobber
```

To install Teams PowerShell public preview, run the PowerShell command below.

> **NOTE**
> You can find the latest preview version at PowerShell Gallery or in PowerShell by running "Find-Module MicrosoftTeams -AllowPrerelease"

```
Install-Module MicrosoftTeams -AllowPrerelease -RequiredVersion "1.1.3-preview"
```

Install the Skype for Business Online Connector

> **NOTE**
> Skype for Business Online Connector is currently part of the latest Teams PowerShell module. If you're using the latest Teams PowerShell public release, you don't need to install the Skype for Business Online Connector.

```
Import-Module -Name MicrosoftTeams
$userCredential = Get-Credential
$sfbSession = New-CsOnlineSession -Credential $userCredential
Import-PSSession $sfbSession
```

Sign in

To start working with Teams PowerShell, sign in with your Azure credentials.

> **NOTE**
> If you're using the latest Teams PowerShell public preview release, you don't need to install the Skype for Business Online Connector.

```
$credential = Get-Credential

#Connect to Microsoft Teams
Connect-MicrosoftTeams -Credential $credential

#Connection to Skype for Business Online and import into Ps session
$session = New-CsOnlineSession -Credential $credential
Import-PsSession $session
```

Update Teams PowerShell

To update Teams PowerShell, open a new elevated PowerShell command prompt and run the following:

```
Update-Module MicrosoftTeams
```

> **WARNING**
> If Teams PowerShell has already been imported into your PowerShell session, updating the module will fail. Close PowerShell and re-open a new elevated PowerShell session.

Uninstall Teams PowerShell

To uninstall Teams PowerShell, open a new elevated PowerShell command prompt and run the following:

```
Uninstall-Module MicrosoftTeams
```

> **WARNING**
> If Teams PowerShell has already been imported into your PowerShell session, uninstalling the module will fail. Close PowerShell and re-open a new elevated PowerShell session.

Next Steps

Now you're ready to manage Teams using Teams PowerShell. See Managing Teams with Teams PowerShell to get started.

Related topics

Managing Teams with Teams PowerShell

Teams PowerShell Release Notes

Microsoft Teams cmdlet reference

Skype for Business cmdlet reference

Manage Teams with Microsoft Teams PowerShell

12/5/2020 • 4 minutes to read • Edit Online

This article shows you how to use Microsoft Teams PowerShell to manage Teams and Skype for Business.

Use this guidance in conjunction with the Microsoft Teams cmdlet reference and Skype for Business cmdlet reference.

Create and manage teams using PowerShell

The cmdlets for creating and managing teams are in the Microsoft Teams PowerShell module.

Teams are backed by Office 365 Groups, so when you create a team, you create a group. There are a set of cmdlets provided for operating on the core team and its settings (`new-team` , `get-team` , `set-team`), managing team users (`add-teamuser` , `remove-teamuser`), as well as cmdlets for managing the channels of the team (`new-teamchannel` , `remove-teamchannel`). All of these cmdlets can be run as end users, but they'll work only on the teams that you own or are a member of. If you are a Global Admin or Teams Service Administrator, you'll be able to act on all teams in your organization.

```
New-Team -Name "Contoso Marketing" -Description "Collaboration space for Contoso's Marketing department"
```

> The **GroupId** used in the Microsoft Teams PowerShell module cmdlets is the same as the **Identity** property returned by `Get-UnifiedGroup` in the Exchange PowerShell module.

Manage policies via PowerShell

> **NOTE**
>
> - Skype for Business Online Connector is being consolidated into Teams PowerShell. It is currently available in public preview. In time, Skype for Business Online cmdlets that apply to Teams will be natively available in the Teams PowerShell module. Installation steps are available in the Install Teams PowerShell article.
> - The cmdlets will be available in your PowerShell session once you connect to Skype for Business Online. For more information, please see Manage Skype for Business Online with Office 365 PowerShell.

Find the cmdlets for managing policies in the Skype for Business cmdlet module.

A policy is a group of settings that can be applied granularly to individual users. Each policy type has its own set of cmdlets for creating, viewing, deleting, and updating the policies themselves, and then assigning those policies to users. The general structure is:

- **GET** commands (for example, `Get-CsTeamsMeetingPolicy`): Returns the policy documents that are available for you to assign in your organization, including the policies created by Microsoft for you to use as well as the custom policies you've created.
  - To find only the custom policies you've created in your organization, use `-Filter "tag:*"` .
- **NEW** commands (for example, `New-CsTeamsMeetingPolicy`): Creates new policies for your organization to assign to users in your organization. Not all policies support the creation of custom policies. Often this is to ensure that the policies you use in your organization have a supported combination of settings.

- **SET** commands (for example, `Set-CsTeamsMeetingPolicy`): Sets particular values on a given policy. Some policies don't have SET commands available, or they contain parameters that can't be customized in the policy. The PowerShell descriptions tell you which parameters can't be customized.
  - To edit the policy that will by default be assigned to users in your organization who do not have a custom policy assigned, run `Set-Cs<PolicyName> -Identity Global`.
- **REMOVE** commands (for example, `Remove-CsTeamsMeetingPolicy`): Deletes a custom policy that has been created in your tenant. If you delete a custom policy that has been assigned to at least one user in your organization, that user will fall back to the global policy.
  - You can't actually remove the global policy in your organization, but if you want to reset the global policy in your organization to the Microsoft-provided default settings, run `Remove-Cs<PolicyName> -Identity Global`.
- **GRANT** command (for example, `Grant-CsTeamsMeetingPolicy`): Assigns a policy to a particular user.
  - To remove a custom policy assignment and make the user fall back to the default policy in your organization, run `Grant-Cs<PolicyName> -Identity <User Identity> -PolicyName $null`.

> **TIP**
> Not all policies allow custom policies to be created, and some policies have settings that you can't customize (so you can view the setting but can't set a custom value during `set-` and `new-`). The documentation for each cmdlet calls out whether parameters are available for use by customers.

Common parameters:

- **Identity**: For `Get-`, `Set-`, `New-`, and `Remove-`, the **Identity** parameter will always refer to a specific policy instance. For `Grant`, the **Identity** parameter refers to a specific user object to whom the policy is being applied.

Manage configurations via PowerShell

Find the cmdlets for managing your configuration in the Skype for Business cmdlet module.

Configurations are buckets of settings maintained in the service that can't be specified at a user level. Settings always apply across the whole organization. Your global configuration is the only effective configuration in your organization. Each configuration type comes with two primary cmdlets:

- `Get-Cs<ConfigurationName>` (for example, `Get-CsTeamsClientConfiguration`):
- SET commands (for example, `Set-CsTeamsClientConfiguration`): set properties in the configuration of that type. Specify the parameters that you want to modify.

> You can reference the configuration that you're modifying in one of two ways: by specifying **-Identity Global**, or by running `Get-Cs<ConfigurationName>` | `Set-Cs<ConfigurationName>`.

What can each admin role do?

Read Use Microsoft Teams admin roles to manage Teams to understand which admin roles can run each PowerShell cmdlet.

Related topics

Installing Teams PowerShell

Teams PowerShell Release Notes

Teams cmdlet reference

Skype for Business cmdlet reference

Use Teams admin roles to manage Teams

Microsoft Teams PowerShell Release Notes

12/5/2020 • 2 minutes to read • Edit Online

This page provides the latest Teams PowerShell change log for both General Availability and Public Preview releases.

Release Notes

> **NOTE**
> **-preview** in the version column below represents updates to Teams PowerShell public preview.

DATE	VERSION	UPDATES
November 2020	1.1.7-preview	• Uses MSAL for authentication & authorization • Refactored Policy Package cmdlets and adds group package assignment • Refactored targeting hierarchy upload commands to use an asynchronous model • User will be prompted twice during initial authentication when they do not use the -credential parameter. Users can pass credentials using the -credential parameter to avoid a duplicate prompt. This behavior will be fixed in the next release.
September 2020	1.1.6	• Skype for Business Online Connector integration
September 2020	1.1.5-preview	• Skype for Business Online Connector integration
July 2020	1.1.4	• Added group policy assignment cmdlets
June 2020	1.1.3-preview	• Skype for Business Online Connector integration • Get-Team optimizations • Enhanced reliability
June 2020	1.0.7	• Added Cmdlet preloading • .Net Framework optimizations

DATE	VERSION	UPDATES
April 2020	1.0.6	• Authenticode and assembly signing • Added Get-CsPolicyPackage • Added Get-CsUserPolicyPackage • Added Get-CsUserPolicyPackageRecommendation • Added Grant-CsUserPolicyPackage • Added New-CsBatchPolicyPackageAssignmentOperation • Added Set-TeamArchivedState • Added Set-TeamPicture • Removed Get-TeamHelp
March 2020	1.0.5	• Added New-CsBatchPolicyAssignmentOperation
Feb 2020	1.0.4	• Get-Team optimizations

Cmdlet availability

> **NOTE**
> The list in the table below only includes cmdlets that are natively part of the Teams PowerShell module. The Teams cmdlets in the Skype for Business Online Connector module are not displayed. However, as those cmdlets are migrated natively into Teams PowerShell, we'll add them to this table.

CMDLET	AVAILABLE IN PUBLIC PREVIEW	AVAILABLE IN GA
Add-TeamChannelUser	Yes	**No**
Add-TeamUser	Yes	Yes
Add-TeamsAppInstallation	Yes	**No**
Connect-MicrosoftTeams	Yes	Yes
Disconnect-MicrosoftTeams	Yes	Yes
Get-CsBatchPolicyAssignmentOperation	Yes	Yes
Get-CsGroupPolicyAssignmentOperation	Yes	**No**
Get-CsOnlinePowerShellEndpoint	Yes	Yes
Get-CsPolicyPackage	Yes	Yes
Get-CsUserPolicyAssignment	Yes	Yes
Get-CsUserPolicyPackage	Yes	Yes

CMDLET	AVAILABLE IN PUBLIC PREVIEW	AVAILABLE IN GA
Get-CsUserPolicyPackageRecommendation	Yes	Yes
Get-Team	Yes	Yes
Get-TeamChannel	Yes	Yes
Get-TeamChannelUser	Yes	**No**
Get-TeamUser	Yes	Yes
Get-TeamsApp	Yes	Yes
Get-TeamsAppInstallation	Yes	**No**
Grant-CsUserPolicyPackage	Yes	Yes
New-CsBatchPolicyAssignmentOperation	Yes	Yes
New-CsGroupPolicyAssignment	Yes	Yes
New-CsBatchPolicyPackageAssignmentOperation	Yes	Yes
New-CsOnlineSession	Yes	Yes
New-Team	Yes	Yes
New-TeamChannel	Yes	Yes
New-TeamsApp	Yes	Yes
Remove-CsGroupPolicyAssignment	Yes	Yes
Remove-Team	Yes	Yes
Remove-TeamChannel	Yes	Yes
Remove-TeamChannelUser	Yes	**No**
Remove-TeamsApp	Yes	Yes
Remove-TeamsAppInstallation	Yes	**No**
Remove-TeamTargetingHierarchy	Yes	**No**
Remove-TeamUser	Yes	Yes
Set-CsGroupPolicyAssignment	Yes	**No**

CMDLET	AVAILABLE IN PUBLIC PREVIEW	AVAILABLE IN GA
Set-Team	Yes	Yes
Set-TeamArchivedState	Yes	Yes
Set-TeamChannel	Yes	Yes
Set-TeamPicture	Yes	Yes
Set-TeamsApp	Yes	Yes
Set-TeamTargetingHierarchy	Yes	**No**
Update-TeamsAppInstallation	Yes	**No**

Related topics

Teams PowerShell Overview

Installing Teams PowerShell

Managing Teams with Teams PowerShell

Microsoft Teams cmdlet reference

Skype for Business cmdlet reference

Move from Skype for Business Online Connector to the Teams PowerShell module

10/14/2020 • 2 minutes to read • Edit Online

To move from using Skype for Business Online Connector to the Teams PowerShell module to manage Teams, you'll need to update your existing PowerShell scripts. This article explains how to do this.

1. Install the latest Teams PowerShell module. For steps, see Install Microsoft Teams Powershell.
2. Uninstall Skype For Business Online Connector. To do this, in Control Panel, go **Programs and Features**, select **Skype for Business Online, Windows PowerShell Module**, and then select **Uninstall**.
3. In your PowerShell scripts, change the module name that's referenced in `Import-Module` from `SkypeOnlineConnector` or `LyncOnlineConnector` to `MicrosoftTeams`.

   For example, change `Import-Module -Name SkypeOnlineConnector` to `Import-Module -Name MicrosoftTeams`.

> **NOTE**
> Admins should continue to use New-CsOnlineSession and import the session before using Skype for Business Online cmdlets.

Related topics

Install Microsoft Teams Powershell

Manage Teams with Teams PowerShell

Teams PowerShell release notes

Microsoft Teams cmdlet reference

Skype for Business cmdlet reference

Get help in Microsoft Teams

8/6/2020 • 2 minutes to read • Edit Online

The Help button in Microsoft Teams is where your users and champions can find all the assistance they might need while using Teams.

Teams provides localized language support for help content. For the most current list of supported languages, see Microsoft Teams supported languages for help content.

- **Browse Topics** - This goes to help content organized by Teams feature. Simple and straightforward guidance to help users get the most out of Teams.
- **Videos** - Our on-demand video content enables users to learn specific tasks quickly. We're continually producing new videos, so check back frequently. Internet access is required, of course.
- **What's New** - Periodic release notes for users and team owners about new or updated Teams features.
- **Share an Idea** - We always want to hear from you about how to improve Teams. This option takes you to our product feedback forum where you can submit new feature requests or vote on existing ones. We constantly review this information as we plan new features.

Microsoft Teams content updates

8/6/2020 • 12 minutes to read • Edit Online

This topic lists Microsoft Teams topics that have been changed recently.

Week of November 23, 2020

PUBLISHED ON	TOPIC TITLE	CHANGE
11/23/2020	Upload tenant and building data in Call Quality Dashboard (CQD)	modified
11/23/2020	User presence in Teams	modified
11/23/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified
11/25/2020	Set up the Ringback bot for Direct Routing	modified
11/25/2020	Limits and specifications for Microsoft Teams	modified
11/25/2020	Manage meeting policies	modified

Week of November 16, 2020

PUBLISHED ON	TOPIC TITLE	CHANGE
11/16/2020	Limits and specifications for Microsoft Teams	modified
11/16/2020	Teams Contact Center	modified
11/16/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified
11/16/2020	Use Power BI to analyze CQD data for Microsoft Teams	modified
11/16/2020	Using CQD Power BI report to view Auto Attendant & Call Queue Historical Report	modified
11/16/2020	Assign policies to your users in Microsoft Teams	modified
11/16/2020	Create a call queue in Microsoft Teams	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/16/2020	Microsoft 365 Government - GCC deployments	modified
11/16/2020	What are Microsoft Teams live events?	modified
11/16/2020	Teams integration with Microsoft Power Platform	modified
11/17/2020	Using CQD Power BI report to view Auto Attendant & Call Queue Historical Report	modified
11/17/2020	Auto Attendant & Call Queue Historical Report	modified
11/17/2020	Calling Plans for Microsoft 365	modified
11/17/2020	Create a call queue in Microsoft Teams	modified
11/17/2020	Session Border Controllers certified for Direct Routing	modified
11/17/2020	Plan Direct Routing	modified
11/17/2020	Limits and specifications for Microsoft Teams	modified
11/17/2020	Phone number management for Canada	modified
11/17/2020	Phone number management for the United States	modified
11/17/2020	Manage the Tasks app for your organization in Microsoft Teams	modified
11/17/2020	Admin quick start - Meetings and live events in Microsoft Teams	modified
11/17/2020	Retention policies in Microsoft Teams	modified
11/17/2020	Advanced Communications add-on for Microsoft Teams	modified
11/17/2020	Microsoft Teams meeting attendance report	modified
11/17/2020	Configure live event settings in Microsoft Teams	modified
11/17/2020	Plan for live events in Microsoft Teams	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/17/2020	Set up for live events in Microsoft Teams	modified
11/17/2020	What are Microsoft Teams live events?	modified
11/17/2020	Toll-free dialing restrictions in Egypt	modified
11/18/2020	Availability in Guatemala	modified
11/18/2020	Limits and specifications for Microsoft Teams	modified
11/18/2020	Teams for Virtual visits	modified
11/18/2020	Sign in to Microsoft Teams	modified
11/18/2020	Teams for Virtualized Desktop Infrastructure	modified
11/19/2020	Teams for Virtual visits	modified
11/19/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified
11/20/2020	Plan for live events in Microsoft Teams	modified
11/20/2020	Sign in to Microsoft Teams	modified

Week of November 09, 2020

PUBLISHED ON	TOPIC TITLE	CHANGE
11/9/2020	Teams Contact Center	modified
11/9/2020	Direct Routing Local Media Optimization	modified
11/10/2020	Information barriers in Microsoft Teams	modified
11/10/2020	Teams Contact Center	modified
11/10/2020	What are Communications Credits?	modified
11/11/2020	Set up an auto attendant for Microsoft Teams	modified
11/11/2020	Information barriers in Microsoft Teams	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/11/2020	Session Border Controllers certified for Direct Routing	modified
11/11/2020	Retention policies in Microsoft Teams	modified
11/12/2020	Introduction to Teams Policy-based Recording for Calling & Meetings	modified
11/12/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified
11/12/2020	Use the Microsoft Teams Meeting add-in in Outlook	modified
11/12/2020	Authorize guest access in Microsoft Teams	modified
11/12/2020	Welcome to Microsoft Teams	modified
11/12/2020	Add funds and manage Communications Credits	modified
11/12/2020	Add a guest to a team	modified
11/12/2020	Audio Conferencing in Microsoft 365	modified
11/12/2020	On-network Conferencing for Audio Conferencing	modified
11/12/2020	Set up Audio Conferencing for small and medium businesses	modified
11/12/2020	Use the Getting Started wizard to set up Business Voice	modified
11/12/2020	What do I need to buy to use Microsoft 365 Business Voice with Calling Plan?	modified
11/12/2020	What is Microsoft 365 Business Voice?	modified
11/12/2020	Calling Plans in Microsoft Teams	modified
11/12/2020	Teams cloud meeting recording	modified
11/12/2020	Voice in Microsoft Teams	modified
11/12/2020	Network settings for cloud voice features	modified
11/12/2020	Call and chat with users from other organizations	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/12/2020	Configure dynamic emergency calling	modified
11/12/2020	Set up an auto attendant for Microsoft Teams	modified
11/12/2020	Create a call queue in Microsoft Teams	modified
11/12/2020	Configure Audio Conferencing settings - Microsoft Teams	modified
11/12/2020	Chat, teams, channels, & apps in Microsoft Teams	modified
11/12/2020	Meetings and conferencing in Microsoft Teams	modified
11/12/2020	Manage your devices in Microsoft Teams	modified
11/12/2020	Configure Direct Routing	modified
11/12/2020	Phone System Direct Routing	modified
11/12/2020	Plan Direct Routing	modified
11/12/2020	Edit guest user information	modified
11/12/2020	Get clients for Microsoft Teams	modified
11/12/2020	Create your first teams and channels	modified
11/12/2020	Monitor usage and feedback in Microsoft Teams	modified
11/12/2020	Onboard early adopters to Microsoft Teams	modified
11/12/2020	Get started with Microsoft Teams	modified
11/12/2020	Choose a path to your organization-wide rollout	modified
11/12/2020	Getting phone numbers for your users	modified
11/12/2020	Getting service phone numbers	modified
11/12/2020	Guest access in Microsoft Teams	modified
11/12/2020	Guest experience in Microsoft Teams	modified
11/12/2020	Hardware requirements for Microsoft Teams	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/12/2020	Here's what you get with Phone System	modified
11/12/2020	Limits and specifications for Microsoft Teams	modified
11/12/2020	Manage external access (federation)	modified
11/12/2020	Manage the free version of Microsoft Teams	modified
11/12/2020	Manage phone numbers for your organization	modified
11/12/2020	Manage resource accounts in Teams	modified
11/12/2020	Manage Audio Conferencing settings for users	modified
11/12/2020	Manage Audio Conferencing settings	modified
11/12/2020	Manage your network topology for cloud voice features in Microsoft Teams	modified
11/12/2020	Manage meeting policies	modified
11/12/2020	Manage meeting settings	modified
11/12/2020	Migrate from Slack to Microsoft Teams	modified
11/12/2020	Install Teams using Microsoft Endpoint Configuration Manager	modified
11/12/2020	Native chat experience for external (federated) users in Microsoft Teams	modified
11/12/2020	Use the Network planner for Microsoft Teams	modified
11/12/2020	Transfer phone numbers to Microsoft Teams	modified
11/12/2020	Plan for Microsoft 365 Groups when creating teams	modified
11/12/2020	Plan for Teams auto attendants and call queues	modified
11/12/2020	Prepare your organization's network for Teams	modified
11/12/2020	Public preview in Microsoft Teams	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/12/2020	Admin quick start - Meetings and live events in Microsoft Teams	modified
11/12/2020	Microsoft Teams virtual meeting rooms	modified
11/12/2020	Microsoft Teams Rooms managed service	modified
11/12/2020	Plan for Microsoft Teams Rooms	modified
11/12/2020	Set up Audio Conferencing for Microsoft Teams	modified
11/12/2020	Set up Communications Credits for your organization	modified
11/12/2020	Turn on or turn off guest access to Microsoft Teams	modified
11/12/2020	Set up Cloud Voicemail	modified
11/12/2020	Setting up Phone System in your organization	modified
11/12/2020	Advanced Communications add-on for Microsoft Teams	modified
11/12/2020	Teams updates	modified
11/12/2020	Manage the Microsoft Teams Exploratory experience	modified
11/12/2020	Teams for Virtualized Desktop Infrastructure	modified
11/12/2020	Configure live event settings in Microsoft Teams	modified
11/12/2020	Plan for live events in Microsoft Teams	modified
11/12/2020	Set up for live events in Microsoft Teams	modified
11/12/2020	What are Microsoft Teams live events?	modified
11/12/2020	Teams and Skype interoperability	modified
11/12/2020	Try or purchase Audio Conferencing in Microsoft 365 for Teams	modified
11/12/2020	Upgrade Microsoft Teams free to subscription	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/12/2020	Use Advisor for Teams to help you roll out Microsoft Teams	modified
11/12/2020	View guest users in a team	modified
11/12/2020	What are Communications Credits?	modified
11/12/2020	What are dial plans?	modified
11/12/2020	Plan and manage emergency calling	modified
11/12/2020	What is Phone System?	modified
11/13/2020	How to roll out Microsoft Teams	modified
11/13/2020	Voice in Microsoft Teams	modified
11/13/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified

Week of November 02, 2020

PUBLISHED ON	TOPIC TITLE	CHANGE
11/2/2020	Set up an auto attendant for Microsoft Teams	modified
11/2/2020	Manage Skype for Business settings in the Microsoft Teams admin center	modified
11/2/2020	Teams Contact Center	modified
11/2/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified
11/3/2020	Set up an auto attendant for Microsoft Teams	modified
11/3/2020	Plan Direct Routing	modified
11/3/2020	Teams policy packages for healthcare	modified
11/3/2020	Public preview in Microsoft Teams	modified
11/3/2020	Manage Teams with Microsoft Teams PowerShell	modified
11/3/2020	Microsoft Teams PowerShell Overview	modified
11/3/2020	Microsoft Teams PowerShell Release Notes	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/3/2020	Azure Sentinel and Microsoft Teams	modified
11/3/2020	How to roll out Microsoft Teams	modified
11/3/2020	Admin training resources - Microsoft Teams	modified
11/3/2020	Quick start - Microsoft Teams for Education admins	modified
11/3/2020	What is Microsoft 365 Business Voice?	modified
11/3/2020	Voice in Microsoft Teams	modified
11/3/2020	Call and chat with users from other organizations	modified
11/3/2020	Chat, teams, channels, & apps in Microsoft Teams	modified
11/3/2020	Phone System Direct Routing	modified
11/3/2020	Get started with Teams for healthcare organizations	modified
11/3/2020	Shifts for Teams	modified
11/3/2020	Firstline Worker Quick Start Guide	modified
11/3/2020	Instructor-led training for Microsoft Teams # < 60 chars	modified
11/3/2020	Admin quick start - Meetings and live events in Microsoft Teams	modified
11/3/2020	Microsoft Teams virtual meeting rooms	modified
11/3/2020	Overview of security and compliance	modified
11/3/2020	How Microsoft Teams uses memory	modified
11/3/2020	Microsoft Teams admin training	modified
11/3/2020	Upgrading Skype for Business to Teams - Microsoft Teams	modified
11/4/2020	Use Power BI to analyze CQD data for Microsoft Teams	modified
11/4/2020	Upload tenant and building data in Call Quality Dashboard (CQD)	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/4/2020	Assign policies to your users in Microsoft Teams	modified
11/4/2020	Audio Conferencing Dial-Out/Call Me At minutes	modified
11/4/2020	Calling Plans for Microsoft 365	modified
11/4/2020	Complimentary dial-out period	modified
11/4/2020	Auto attendant and call queue dialing and voice recognition reference	modified
11/4/2020	Firstline Worker Quick Start Guide	modified
11/4/2020	Manage policy packages in Microsoft Teams	modified
11/4/2020	Manage meeting settings	modified
11/4/2020	Outbound call restrictions - Audio Conferencing & PSTN calls	modified
11/4/2020	Plan for Teams auto attendants and call queues	modified
11/4/2020	Microsoft Teams policies and policy packages for EDU admins	modified
11/4/2020	Teams policy packages for government	modified
11/4/2020	Teams policy packages for healthcare	modified
11/4/2020	Introduction to Teams Policy-based Recording for Calling & Meetings	modified
11/4/2020	Set up Call Quality Dashboard (CQD)	modified
11/4/2020	Authorize guest access in Microsoft Teams	modified
11/4/2020	Set up an auto attendant for Microsoft Teams	modified
11/4/2020	Manage tags in Microsoft Teams	modified
11/4/2020	Teams and Skype interoperability	modified
11/5/2020	Manage the Praise app in the Teams admin center	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
11/5/2020	Teams for Virtualized Desktop Infrastructure	modified
11/5/2020	Teams and Skype interoperability	modified
11/5/2020	Phone number management for the United States	modified
11/5/2020	Onboard support for Microsoft Teams	modified
11/6/2020	Understand calling in Microsoft Teams	modified
11/6/2020	Sign in to Teams using modern authentication	modified
11/6/2020	Microsoft Teams PowerShell Release Notes	modified

Week of October 26, 2020

PUBLISHED ON	TOPIC TITLE	CHANGE
10/26/2020	Plan for Teams auto attendants and call queues	modified
10/26/2020	Upgrading from Skype for Business to Teams FAQ	modified
10/26/2020	Implement Quality of Service in Microsoft Teams	modified
10/26/2020	Virtual visits with Microsoft Teams and the Bookings app	modified
10/26/2020	Patients App and EHR integration DSTU2 interface	modified
10/26/2020	Use Teams healthcare templates in the admin center	modified
10/26/2020	Templates for healthcare organizations	modified
10/26/2020	Secure Messaging for healthcare organizations using Microsoft Teams	modified
10/26/2020	Connect the Patients app to Azure API for FHIR	modified
10/26/2020	Patients app for Teams admins	modified
10/26/2020	Patients app overview	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
10/26/2020	Auditing Patients app for Teams IT and compliance admins	modified
10/26/2020	Patients App and EHR integration STU3 interface	modified
10/26/2020	Get started with Teams for healthcare organizations	modified
10/26/2020	Teams for Healthcare	modified
10/26/2020	Hardware requirements for Microsoft Teams	modified
10/26/2020	Teams sessions at Ignite 2020	modified
10/26/2020	Manage the Lists app for your organization	modified
10/26/2020	Manage the Microsoft Teams Exploratory experience	modified
10/27/2020	Accessibility solutions for Skype for Business Online and Microsoft Teams	modified
10/27/2020	Patients App and EHR integration DSTU2 interface	modified
10/27/2020	Connect the Patients app to Azure API for FHIR	modified
10/27/2020	Patients app for Teams admins	modified
10/27/2020	Patients app overview	modified
10/27/2020	Auditing Patients app for Teams IT and compliance admins	modified
10/27/2020	Patients App and EHR integration STU3 interface	modified
10/27/2020	Get started with Teams for healthcare organizations	modified
10/27/2020	Use Teams templates to create a new team	modified
10/27/2020	Get started with Teams templates using Microsoft Graph	modified
10/27/2020	Priority notifications in Teams messaging	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
10/27/2020	Upgrade to Teams from a Skype for Business on-premises deployment - Microsoft Teams	modified
10/27/2020	Phones and Devices for Teams	modified
10/27/2020	Session Border Controllers certified for Direct Routing	modified
10/27/2020	Teams for Virtual visits	modified
10/27/2020	Install Teams using Microsoft Endpoint Configuration Manager	modified
10/27/2020	Teams for Virtualized Desktop Infrastructure	modified
10/27/2020	Use OneDrive for Business and SharePoint for meeting recordings	modified
10/28/2020	Cortana voice assistance in Microsoft Teams	modified
10/28/2020	Create a call queue	modified
10/28/2020	Manage your devices in Microsoft Teams	modified
10/28/2020	Phones for Microsoft Teams	modified
10/28/2020	Get started with Teams for healthcare organizations	modified
10/28/2020	Teams policy packages for healthcare	modified
10/28/2020	Environmental compatibility - Microsoft Teams	modified
10/28/2020	Virtual visits with Microsoft Teams and the Bookings app	modified
10/28/2020	Microsoft Teams Chalk Talks	modified
10/28/2020	Plan for media bypass with Direct Routing	modified
10/28/2020	Manage settings for your organization	modified
10/28/2020	Teams for Virtual visits	modified
10/28/2020	Message delegation	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
10/28/2020	Use Teams healthcare templates in the admin center	modified
10/28/2020	Templates for healthcare organizations	modified
10/28/2020	Secure Messaging for healthcare organizations using Microsoft Teams	modified
10/28/2020	Shifts for Teams	modified
10/28/2020	Manage the Shifts app for your organization	modified
10/28/2020	Manage the Lists app for your organization	modified
10/28/2020	Manage the Tasks app for your organization in Microsoft Teams	modified
10/28/2020	Manage Teams transitioning to the new Teams admin center	modified
10/28/2020	Microsoft Teams Upgrade | Environment Evaluation, Discovery Questions	modified
10/29/2020	IT Admin Guide to Insights in Teams for Education	modified
10/29/2020	Create a custom team template in Microsoft Teams	modified
10/29/2020	Create a new template from an existing team template in Microsoft Teams	modified
10/29/2020	Auto attendant and call queue dialing and voice recognition reference	modified
10/29/2020	Use Teams healthcare templates in the admin center	modified
10/29/2020	Teams for Education	modified
10/29/2020	Use Teams templates to create a new team	modified
10/29/2020	Use Teams government templates in the admin center	modified
10/29/2020	Get started with Teams manufacturing templates in the admin center	modified

PUBLISHED ON	TOPIC TITLE	CHANGE
10/29/2020	Microsoft Teams resources for Education admins	modified
10/29/2020	Use Teams retail templates in the admin center	modified
10/29/2020	What are Microsoft Teams live events?	modified
10/29/2020	Search the audit log for events in Microsoft Teams	modified
10/29/2020	Set up an auto attendant for Microsoft Teams	modified
10/29/2020	Patients App and EHR integration DSTU2 interface	modified
10/29/2020	Connect the Patients app to Azure API for FHIR	modified
10/29/2020	Patients app for Teams admins	modified
10/29/2020	Patients app overview	modified
10/29/2020	Auditing Patients app for Teams IT and compliance admins	modified
10/29/2020	Patients App and EHR integration STU3 interface	modified
10/29/2020	Get started with Teams for healthcare organizations	modified
10/30/2020	Adopt Microsoft Teams	modified
10/30/2020	Create a call queue	modified
10/30/2020	Upgrade Teams phones to Teams displays	modified
10/30/2020	Release notes for Microsoft Teams	modified
10/30/2020	Availability in Australia	modified
10/30/2020	Country/region availability - Audio Conferencing, Calling Plans	modified
10/30/2020	Set up an auto attendant for Microsoft Teams	modified
10/30/2020	Create a call queue in Microsoft Teams	modified

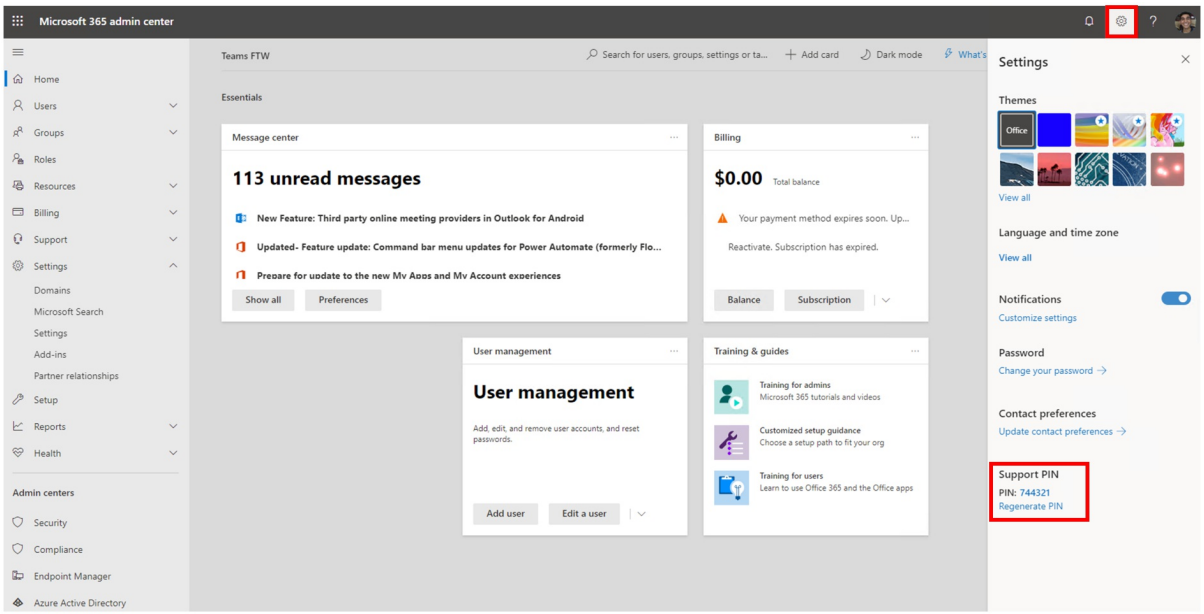
PUBLISHED ON	TOPIC TITLE	CHANGE
10/30/2020	Custom apps store	modified
10/30/2020	Auto attendant and call queue dialing and voice recognition reference	modified
10/30/2020	Manage discovery of private teams in Microsoft Teams	removed
10/30/2020	User presence in Teams	modified

How to look up your support PIN

5/13/2020 • 2 minutes to read • Edit Online

To look up your support PIN, which enables Microsoft Customer Support through the telephone, please follow these steps:

1. Log in to the Office Admin Center.
2. Click on the gear icon.
3. Your support PIN will be displayed in the lower right pane. You may also choose to re-generate your PIN if needed.



Country and region availability for Audio Conferencing and Calling Plans

11/2/2020 • 7 minutes to read • Edit Online

You can select a country or region to see what cloud voice features are available to your organization.

Select your country or region to see what's available for your organization

If you're looking for a spreadsheet with all countries and regions, download and save the Cloud voice feature country/region availability spreadsheet.

After you've verified if one of the Skype for Business or Microsoft Teams services are available, you can see Skype for Business and Microsoft Teams add-on licensing to help you buy licenses and assign them to your users.

> **NOTE**
>
> If you need to get more telephone numbers for your users, see Getting phone numbers for your users or, for phone number request forms, Manage phone numbers for your organization.

Want to learn more about these services

Audio Conferencing

Sometimes people in your organization will need to use a phone to call in to a meeting. Skype for Business and Microsoft Teams includes the Audio Conferencing feature for just this situation! People can call in to meetings using a phone instead of using the Skype for Business and Microsoft Teams apps on a mobile device or PC. When you've decided that you want Audio Conferencing for your organization, buy one **Audio Conferencing** license for each person in your organization who is going to schedule/host an audio meeting.

With Audio Conferencing, there are toll and toll free phone numbers that can be used by your users to dial in to meetings. Toll numbers from the following countries or regions are automatically assigned as shared audio conferencing numbers to organizations when they're enabled for Audio Conferencing. Dedicated toll and toll free numbers can be assigned to your organization from additional cities.

IMPORTANT

There isn't a resource that contains a listing of all of the dial-in numbers for Audio Conferencing. To find out if there are dial-in phone numbers available in your area or country/region, go to **Skype for Business admin center** > **Voice** > **Phone Numbers**, click **Add**, and then click **New Service Numbers**. Use the lists for **Country/Region**, **State/Region**, and **City** to filter your search. If you are looking for toll free service numbers, select **toll free** from the **State/Region** list.

To see more about Audio Conferencing, see Audio Conferencing common questions

Pricing for Audio Conferencing

Using the Call Me feature or when adding other people to a meeting so they can join it

In Audio Conferencing, the "*Call Me*" feature is used to let other people join a dial-in meeting. Use the drop-down list in this article to search for the country/region and see if this feature is available.

Caution

Dialing out to toll free or free phone numbers may not be possible, because some toll free numbers only function from within a certain country or area within a country. For example, if you dial out from the United States to a toll free number in Brazil, the call may not be successful because the call didn't originate from within Brazil or from a specific region within Brazil. The ability to dial out to toll free numbers varies widely depending on the restrictions of the toll free number dialed. Unfortunately, we can't control this behavior, and as a result, your experience may vary depending on the toll free number dialed and the restrictions of the toll free number.

Dialing out from a meeting to another country/region in the world that isn't listed below is available using Communication Credits. For those users, you'll need to Set up Communications Credits for your organization.

Phone System

With Phone System, you create auto attendants and call queues (with a toll or toll free number) to answer incoming calls for your organization. When you add a Calling Plan for users, they can use Skype for Business to take care of basic call-control tasks, such as placing and receiving calls, transferring calls, and muting and unmuting calls. **Phone System** users click a name in their address book, and Skype for Business will place a call to that person. To place and receive calls, **Phone System** users use their mobile devices, a headset with a laptop or PC, or one of many IP phones that work with Skype for Business.

> The availability of toll phone numbers from some of these locations might vary at any given time depending on inventory levels. In addition to getting phone numbers for individual users, it's also possible to search and acquire toll or toll free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants and call queues. These are called service numbers. See Getting service phone numbers to get phone numbers. But for your users, after you assign a Calling Plan to them, you can assign a user phone number so they can make and receive phone calls. To find those phone numbers, go to

> Getting phone numbers for your users. You can also see Assign, change, or remove a phone number for a user.

Pricing for Phone System

> **NOTE**
> The availability of toll phone numbers from some of these locations might vary at any given time depending on inventory levels.

Use the drop-down list at the top of the page to search for a country or region and what services are available.

Calling Plans

Along with Phone System, a Calling Plans let users make and receive phone calls. You first get a user (subscriber) phone number (not a service number) to assign to the user, and then assign a Calling Plan. There are two types of Calling Plans available: **Domestic** and **Domestic and International**. See Phone System and Calling Plans for more details.

You can also see Phone System and Calling Plans licensing for licensing information.

> **NOTE**
> The country/region is based on the location of the user's license in the **Microsoft 365 admin center** > **Active Users** and **not** the billing address listed under the **Organization Profile** in the **Microsoft 365 admin center**.

Toll and toll free phone numbers for services

In addition to getting phone numbers for individual users, it's also possible to search and acquire toll or toll free phone numbers for services such as Audio Conferencing (for conference bridges), auto attendants, and call queues. These are called service numbers.

The following is a list of capitals and major cities from where you can get toll service numbers to use with Audio Conferencing and Calling Plans. You get toll service numbers from these locations using the **Skype for Business admin center**.

If you want to get a toll or toll free service number, you can see Getting service phone numbers. If you already have a toll or toll free service number that you want to transfer from a different provider, see Manage phone numbers for your organization.

Use the drop-down list at the top of the page to search for a country or region and what services are available.

Communications Credits

We recommend that you set up Communications Credits for your Audio Conferencing and Calling Plans users that need the ability to dial out to **any destination**. Many countries/regions are included, but some destinations might not be included in your Calling Plan or Audio Conferencing subscriptions.

If you don't set up Communications Credits and assign a license to users, and you run out of minutes for your organization (depending on your Calling Plan or Audio Conferencing plan or your country/region), they won't be able to make calls or dial out from meetings. You can find out more information including recommended funding amounts by reading What are Communications Credits?

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Availability in Albania

6/25/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Albania.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute-only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Tirana
Are toll numbers available?	Yes (on request)
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Algeria

6/25/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Algeria.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Non-geographic (on request)
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Antigua and Barbuda

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and Calling Plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Antigua and Barbuda.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Argentina

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Argentina.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Buenos Aires If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Buenos Aires • Cordoba • La Plata • Mar Del Plata • Mendoza • San Miguel de Tucuman
Are toll numbers available?	Yes
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Australia

11/2/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Australia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No. Please contact us.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes, see Telstra Calling.
Minutes available for Calling Plans	See Telstra Calling.
Can make outbound calls to?	See Telstra Calling.

IMPORTANT

To delete Australian subscriber numbers (provided by Telstra), contact Telstra directly. To update emergency address information for Australian subscriber numbers (provided by Telstra), contact Telstra directly. For more information, see Telstra Calling.

If your tenant is located outside Australia

Starting September 1, 2019, if your tenant is located outside Australia, you can purchase Calling Plans for users who are located in Australia. This is available for the following countries and regions.

FEATURE	DETAILS
Americas	United States, U.S. Outlying Islands
APAC	Bangladesh, Bhutan, Brunei, Cambodia, Hong Kong, Indonesia, Laos, Macao, Malaysia, Maldives, Myanmar, Nepal, Philippines, Singapore, Sri Lanka, Thailand, Timor-Leste, Vietnam
EMEA	Åland Islands, Andorra, Austria, Belgium, Bouvet Island, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Germany, Gibraltar, Greece, Greenland, Guernsey, Hungary, Iceland, Ireland, Isle of Man, Italy, Jan Mayen, Jersey, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Slovakia, Slovenia, Spain, Svalbard, Sweden, Switzerland, United Kingdom, Vatican City

Note that Telstra Calling will show up as an add-on only for users who are located in Australia and the countries and regions listed above, once provisioned by Telstra. For users in other geographies, they'll continue to attach Microsoft Calling Plans or Direct Routing, as applicable. For more information, see Telstra Calling.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Adelaide • Brisbane • Canberra • Darwin • Melbourne • Newcastle • Perth • Sydney • Wollongong
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for auto attendants, call queues or audio conferencing service numbers, please contact us.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Austria

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Austria.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Vienna If you want dedicated phone numbers, see Getting service phone numbers.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Yes
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Vienna
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Bahamas

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the Bahamas.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Bahrain

7/23/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Bahrain.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	No
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Manama If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Manama
Are toll numbers available?	No
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Bangladesh

6/26/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Bangladesh.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Non-geographic (on request)
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Barbados

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Barbados.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Belarus

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Belarus.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Available with Communications Credits pay per minute

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Belgium

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Belgium.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Brussels If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Bruges • Brussels • Charleroi • Ghent • Liege • Namur
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendant, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Belize

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Belize.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Benin

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Benin.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Bermuda

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Bermuda.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Bosnia & Herzegovina

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Bosnia and Herzegovina.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Brazil

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Brazil.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Sao Paulo If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Rio de Janeiro • Sao Paulo • Other cities on request
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

See also

Other Resources

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Brunei

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Brunei.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	No
Are phone numbers automatically assigned for Audio Conferencing?	Not applicable
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Bulgaria

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Bulgaria.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Sofia If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Plovdiv • Sofia • Varna
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Cambodia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Cambodia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Phnom Penh
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Cameroon

6/25/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Cameroon.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Non-geographic (on request)
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Canada

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Canada.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Toronto If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 3000 minute Domestic Calling Plan • Domestic and International Calling Plan: 3000 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

> **NOTE**
> Calls to the U.S. are treated as domestic calls.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Calgary • Montreal • Toronto • Vancouver • Winnipeg
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

> **NOTE**
> When a Calling Plan (domestic or domestic and international) user in the U.S. dials a phone number in Canada it will be treated as a domestic call. This is also the case when a user in Canada will make a call to a U.S. number.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Cayman Islands

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the Cayman Islands.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Chile

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Chile.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Santiago (only available to organizations within Chile) If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Santiago **Note:** Only available to organizations within Chile.
Are toll numbers available?	Yes **Note:** Only available to organizations within Chile.
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in China

9/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for China.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, for use by users located outside of China. Please contact your account team for additional information.
Are phone numbers automatically assigned for Audio Conferencing?	Non-geographic. Phone numbers aren't linked to a specific city or location. If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Yes, except for customers who purchase the service from China. Dial-out capabilities are disabled for customers who purchase the service from China.

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Beijing
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes (on request), except for customers who purchase the service from China. Toll-free numbers are not available for customers who purchase the service from China.

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Colombia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Colombia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Bogota If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Bogota • Medellin
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Costa Rica

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Costa Rica.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Phone numbers aren't linked to a specific city or location. If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Croatia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Croatia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Zagreb If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Osijek • Rijeka • Split • Zadar • Zagreb
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Cyprus

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Cyprus.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Nicosia If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Nicosia
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Czech Republic

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the Czech Republic.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Prague If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Hradec Kralove • Liberec • Olomouc • Pilsen • Prague
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Denmark

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Denmark.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Copenhagen If you want dedicated phone numbers, see Getting service phone numbers.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Copenhagen
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Availability in Dominica

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Dominica.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Dominican Republic

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Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the Dominican Republic.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for Santiago. If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Santiago
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Ecuador

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Ecuador.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Egypt

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Egypt.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in El Salvador

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Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for El Salvador.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	San Salvador
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Estonia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Estonia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Tallinn If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Tallinn
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Finland

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Finland.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Helsinki If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Helsinki • Tampere • Turku
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in France

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for France.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Paris If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to French premium numbers?	Yes, fully supported when using Communications Credits to pay per minute.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Angers • Bordeaux • Carcassonne • Dijon • Grenoble • Le Havre • Lille • Lyon • Marseille • Montpellier • Nantes • Nice • Paris • Reims • Rennes • Saint-Etienne • Strasbourg • Toulon • Toulouse
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Georgia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Georgia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Tbilisi
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Germany

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Germany.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Munich If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic calling OR 600 minutes of international calling (whichever is reached first within a calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Frankfurt • Munich
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Ghana

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Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Ghana.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Greece

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Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Greece.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Athens If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Athens • Larissa • Patras • Thessaloniki
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Grenada

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Grenada.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Guam

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Guam.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Guatemala

12/5/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Guatemala.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Cuidad de Guatemala
Are toll numbers available?	Yes (on request) Toll numbers are only accessible from within the country.
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Honduras

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Honduras.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Tegucigalpa
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Hong Kong

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Hong Kong.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Hong Kong If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Hong Kong
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Hungary

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Hungary.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Budapest If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Budapest • Debrecen • Miskolc • Szeged
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in India

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for India.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Microsoft doesn't sell Audio Conferencing in India. TATA Communications offers a dial-in and dial-out service that is compatible with Microsoft Teams Meetings. For more information, please visit TATA Communications' website.
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Chennai • Mumbai If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Chennai • Mumbai • Other cities on request
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

Note that in India, service numbers can only be used for Audio Conferencing. So, if you want to get toll and toll-free phone numbers for Audio Conferencing, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Indonesia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Indonesia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Jakarta (on request)
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Ireland

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Ireland.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Dublin If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Dublin
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Israel

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Israel.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Tel Aviv If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Haifa • Jerusalem • Tel Aviv
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Italy

12/5/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Italy.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Milan If you want dedicated phone numbers, see Getting service phone numbers.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month) Tariff Transparency (IT) Tariff Transparency (EN)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Milan
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Availability in Jamaica

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Jamaica.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Japan

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Japan.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Tokyo If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

IMPORTANT

Only available through SoftBank for Japanese-based tenants. For more information, see SoftBank Calling for Office 365).

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes, see SoftBank Calling for Office 365.
Minutes available for Calling Plans	See SoftBank Calling for Office 365.
Can make outbound calls to?	See SoftBank Calling for Office 365.

IMPORTANT

To delete user (subscriber) numbers in Japan (Provided by SoftBank) please contact SoftBank directly. To update emergency address information for user (subscriber) numbers in Japan (Provided by SoftBank) please contact SoftBank directly. For more information, see SoftBank Calling for Office 365.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Tokyo
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Jordan

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Jordan.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Amman (on request)
Are toll numbers available?	Yes (on request)
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Kenya

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Kenya.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Nairobi (on request)
Are toll numbers available?	Yes (on request)
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Kuwait

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Kuwait.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Kuwait City
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Latvia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Latvia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Phone numbers aren't linked to a specific city or location. If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Riiga (on request)
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes (on request)

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Lithuania

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Lithuania.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Vilnius If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Vilnius
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Luxembourg

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Luxembourg.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Luxembourg If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Luxembourg
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Macedonia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Macedonia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	No
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Malaysia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Malaysia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Kuala Lumpur If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Kuala Lumpur
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Malta

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Malta.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Valletta If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Valletta
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Mexico

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Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Mexico.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Mexico City If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Mexico City
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Moldova

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Moldova.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Monaco

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Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Monaco.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Morocco

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Morocco.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Casablanca
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Netherlands

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the Netherlands.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Amsterdam If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Amsterdam
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in New Zealand

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for New Zealand.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Wellington If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Auckland • Christchurch • Dunedin • Hamilton • Wellington
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Nicaragua

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Nicaragua.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	No
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Managua (on request)
Are toll numbers available?	Yes (on request)
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Nigeria

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Nigeria.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Lagos
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Northern Mariana Islands

6/25/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Northern Mariana Islands.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Norway

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Norway.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Oslo If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Oslo
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Pakistan

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Pakistan.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	No
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Karachi If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Karachi
Are toll numbers available?	Yes
Are toll-free numbers available?	No

Note that in Pakistan, service numbers can only be used for Audio Conferencing. So, if you want to get toll and toll-free numbers for Audio Conferencing, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Panama

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Panama.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Panama City If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Panama City
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Paraguay

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Paraguay.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Peru

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Peru.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Lima If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Lima
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Philippines

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the Philippines.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Manila If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Manila
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Poland

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Poland.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Warsaw If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Bydgoszcz • Gdansk • Katowice • Krakow • Lodz • Lublin • Poznan • Szczecin • Warsaw • Wroclaw
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Portugal

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Portugal.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Lisbon If you want dedicated phone numbers, see Getting service phone numbers.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Lisbon
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Availability in Puerto Rico

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Puerto Rico.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans	3000 domestic minutes or 600 international minutes (whichever is reached first per calendar month). United States domestic calling includes calls to all 50 U.S. states and Puerto Rico. Users assigned with the license usage location of U.S. and/or Puerto Rico share the same pool of minutes.
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	San Juan
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Qatar

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Qatar.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Romania

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Romania.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Phone numbers aren't linked to a specific city or location. If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Russia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Russia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Moscow If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Moscow • St. Petersburg (on request)
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Saint Kitts and Nevis

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Saint Kitts and Nevis.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Saint Lucia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Saint Lucia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Saudi Arabia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Saudi Arabia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Serbia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Serbia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Singapore

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Singapore.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Singapore If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Singapore
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Slovakia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Slovakia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Bratislava If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Bratislava • Kosice • Nitra • Presov • Zilina
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Slovenia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Slovenia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Ljubljana If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Celje • Ljubljana • Maribor City
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in South Africa

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for South Africa.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Cape Town If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Cape Town • Durban • Johannesburg
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in South Korea

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for South Korea.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Seoul If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Spain

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Spain.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Madrid If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Barcelona • Madrid
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Sri Lanka

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Sri Lanka.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Phone numbers aren't linked to a specific city or location. If you want dedicated phone numbers, seeGetting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Sweden

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Sweden.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Stockholm If you want dedicated phone numbers, see Getting service phone numbers.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Gothenburg • Helsingborg • Linkoping • Malmo • Orebro • Stockholm • Uppsala • Vasteras
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Availability in Switzerland

9/30/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Switzerland.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Zurich If you want dedicated phone numbers, see Getting service phone numbers.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Zurich
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers

Country and region availability for Audio Conferencing and Calling Plans

Availability in Taiwan

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Taiwan.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Taipei If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Taipei
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Thailand

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Thailand.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Bangkok If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Bangkok • Chiang Mai • Chon Buri • Nakhon Ratchasima
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Trinidad and Tobago

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Trinidad and Tobago.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Tunisia

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Tunisia.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes, pay-per-minute only
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Turkey

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Turkey.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Istanbul If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Ankara • Antalya • Istanbul • Izmir
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Turks and Caicos Islands

6/25/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Turks and Caicos Islands.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll free numbers available?	Yes

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Uganda

6/25/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Uganda.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes. Pay-per-minute only.
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Non-geographic. Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Non-geographic (on request)
Are toll free numbers available?	No

If you want to get toll and toll free phone numbers for Audio Conferencing, Auto attendants and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the Ukraine

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Ukraine.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Phone numbers aren't linked to a specific city or location. If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Phone numbers aren't linked to a specific city or location.
Are toll numbers available?	Yes
Are toll-free numbers available?	No

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	No

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the United Arab Emirates (UAE)

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for United Arab Emirates.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the United Kingdom (U.K.)

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the United Kingdom.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • London If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan • 240 minute Domestic Calling Plan • 1200 minute Domestic Calling Plan • Domestic and International Calling Plan: 1200 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)

FEATURE	DETAILS
Can make outbound calls to premium numbers?	Partially supported: Calls to shared cost numbers (prefixes 44843, 44844, 44845, 44870, 44871, 44872) are supported using Communications Credits to pay per minute. Calls to 449XX prefixes are not supported.
Can make outbound calls to?	To 196 countries, including these.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Birmingham • Bolton • Bournemouth • Bradford • Brighton • Bristol • Coventry • Hull • Leeds • Leicester • Liverpool • London • Manchester • Newcastle • Nottingham • Plymouth • Sheffield • Stoke-on-Trent • Teesside (Middlesbrough)
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in the United States (U.S.)

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for the United States. See How to buy a calling plan for more information.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	Yes, for: • Chicago • Dallas • Los Angeles • New York City If you want dedicated phone numbers, see Getting service phone numbers for Skype for Business and Microsoft Teams.
Dial-out capability using the Call Me feature	Available

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	Yes

FEATURE	DETAILS
Minutes available for Calling Plans.	There are four plan options available per calendar month: • 120 minute Domestic Calling Plan (availability is limited) • 240 minute Domestic Calling Plan (availability is limited) • 3000 minute Domestic Calling Plan • Domestic and International Calling Plan: 3000 minutes of domestic -OR- 600 minutes of international calling (whichever is reached first in the calendar month)
Can make outbound calls to premium numbers?	Not supported at this time.
Can make outbound calls to?	To 196 countries, including these.

NOTE

Calls to Canada are treated as domestic calls.

NOTE

United States domestic calling includes calls to all 50 U.S. states and Puerto Rico. Users assigned with the license usage location of U.S. and/or Puerto Rico share the same pool of minutes.

Toll and toll-free numbers for services

FEATURE	DETAILS

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Alabama, Birmingham • Arizona, Phoenix • Arkansas, Little Rock • California, Los Angeles • California, San Francisco • Colorado, Denver • Columbia, Washington DC • Connecticut, Hartford • Delaware, Wilmington • Florida, Miami • Georgia, Atlanta • Hawaii, Honolulu • Idaho, Boise • Illinois, Aurora • Illinois, Chicago • Illinois, Cicero • Indiana, Indianapolis • Iowa, Iowa City • Kansas, Wichita • Kentucky, Louisville • Louisiana, New Orleans • Maine, Portland • Maryland, Baltimore • Massachusetts, Boston • Michigan, Pontiac • Minnesota, Minneapolis • Minnesota, St. Paul • Mississippi, Jackson • Missouri, Kansas City • Missouri, St. Louis • Montana, Billings • North Carolina, Charlotte • North Dakota, Fargo • Nebraska, Omaha • Nevada, Las Vegas • New Hampshire, Manchester • New Jersey, Newark • New Mexico, Albuquerque • New York, New York City • Ohio, Columbus • Oklahoma, Oklahoma City • Oregon, Portland • Pennsylvania, Philadelphia • Rhode Island, Providence • South Carolina, Charleston • South Dakota, Sioux Falls • Tennessee, Memphis • Texas, Dallas • Texas, Houston • Utah, Salt Lake City • Vermont, Brattleboro • Virginia, Richmond • Washington, Seattle • West Virginia, Charleston • Wisconsin, Milwaukee • Wyoming, Laramie

FEATURE	DETAILS
Are toll numbers available?	Yes
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Uruguay

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Uruguay.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Montevideo (on request)
Are toll numbers available?	Yes (on request)
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Venezuela

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Venezuela.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	Not applicable
Are toll numbers available?	No
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

Availability in Vietnam

5/14/2020 • 2 minutes to read • Edit Online

Find another country or region, or learn more about country and region availability for Audio Conferencing and calling plans.

Here are the Microsoft 365 and Office 365 services for Skype for Business and Microsoft Teams available for Vietnam.

Audio Conferencing

FEATURE	DETAILS
Is Audio Conferencing available for purchase?	Yes
Are phone numbers automatically assigned for Audio Conferencing?	No
Dial-out capability using the Call Me feature	Requires communication credits

Phone System

FEATURE	DETAILS
Is Phone System available for purchase?	Yes
Auto attendants	Available
Call queues	Available
Voicemail	Available

Calling Plans

FEATURE	DETAILS
Calling Plans are available to purchase?	No
Minutes available for Calling Plans	Not applicable
Can make outbound calls to?	Not applicable

If Calling Plans are not available to purchase, consider using Phone System Direct Routing. With Direct Routing, you can use Phone System with virtually any telephony carrier.

Toll and toll-free numbers for services

FEATURE	DETAILS
What capitals or major cities can you get toll numbers for?	• Hanoi (on request) • Ho Chi Minh (on request)
Are toll numbers available?	Yes (on request)
Are toll-free numbers available?	Yes

If you want to get toll and toll-free phone numbers for Audio Conferencing, Auto attendants, and Call queues, see Getting service phone numbers for Skype for Business and Microsoft Teams.

Communications Credits

FEATURE	DETAILS
Are Communications Credits available?	Yes

If you want to set them up, see Set up Communications Credits for your organization.

Related topics

Getting service phone numbers for Skype for Business and Microsoft Teams

Country and region availability for Audio Conferencing and Calling Plans

EN 301 549 Déclaration de conformité en matière d'accessibilité

4/3/2020 • 31 minutes to read • Edit Online

Date : 2 octobre 2018

Nom du produit : Microsoft Teams

Description du produit : Microsoft Teams est l'outil de chat collaboratif d'Office 365 qui intègre toutes les personnes, contenus et outils dont votre équipe a besoin pour être plus impliquée et efficace.

Plate-forme : Win32

Version du produit : 1.2.00.6412

Site web en matière d'accessibilité : Microsoft Accessibility

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Section 1 Champ d'application

La présente attestation de conformité à la norme EN 301 549 v2.1.2 (PDF) précise les exigences fonctionnelles en matière d'accessibilité applicables aux produits et services TIC de Microsoft.

Section 2 Références

Section 3 Définitions et abréviations

Section 4 Déclarations de conformité aux exigences fonctionnelles

Exigences fonctionnelles d'accessibilité

Section 5 Exigences génériques

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES
5.1.2.2 – 5.1.6.2	Non applicable	Fonctionnalité fermée
5.2 Activation des fonctionnalités d'accessibilité Dans le cas où la TIC présente des fonctionnalités d'accessibilité documentées, il est possible d'activer les fonctionnalités qui sont requises pour répondre à un besoin spécifique sans faire appel à une méthode qui ne prend pas en charge ce besoin.	Pris en charge	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES
5.3 Biométrie Dans le cas où la TIC fait appel à des caractéristiques biologiques, elle ne fait pas de l'utilisation d'une caractéristique biologique le seul moyen d'identification de l'utilisateur ou de contrôle de la TIC.	Non applicable	
5.4 Préservation des informations d'accessibilité pendant la conversion Dans le cas où la TIC convertit des informations ou une communication, elle préserve toutes les informations non exclusives documentées qui sont fournies pour l'accessibilité dans la mesure où ces informations peuvent être contenues dans le format de destination ou prises en charge par ce dernier.	Non applicable	
5.5.1 Mode de fonctionnement Dans le cas où la TIC présente des éléments actionnables qui doivent être actionnés en les prenant, en les pinçant ou en exerçant une torsion du poignet, un autre mode de fonctionnement accessible qui ne nécessite pas ces gestes est proposé.	Non applicable	
5.5.2 Discernabilité des éléments actionnables Dans le cas où la TIC a des éléments actionnables, elle propose un moyen de discerner chaque élément actionnable sans que la vision ne soit nécessaire et sans accomplir le geste associé à cet élément actionnable.	Non applicable	
5.6.1 Statut tactile ou auditif DDans le cas où la TIC est dotée d'une commande de verrouillage et où cette commande est présentée visuellement à l'utilisateur, la TIC propose au moins un mode de fonctionnement avec lequel il est possible de déterminer le statut de la commande par le son ou par le toucher sans actionner la commande.	Non applicable	
5.6.2 Statut visuel Dans le cas où la TIC est dotée d'une commande de verrouillage et où cette commande n'est pas présentée visuellement à l'utilisateur, la TIC propose au moins un mode de fonctionnement avec lequel il est possible de déterminer visuellement le statut de la commande lorsque la commande est présentée.	Non applicable	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES
5.7 Répétition automatique des touches Dans le cas où la TIC est dotée de la fonction répétition automatique des touches et où cette fonction ne peut être désactivée : a) le délai avant la répétition automatique est réglable jusqu'à au moins 2 secondes ; et b) la vitesse de répétition peut être réduite jusqu'à un caractère par intervalle de 2 secondes.	Non applicable	
5.8 Acceptation des doubles frappes sur le clavier Dans le cas où un clavier est fourni, le délai, après une frappe sur le clavier, pendant lequel une autre frappe ne sera pas acceptée si elle est identique à la frappe précédente est réglable jusqu'à au moins 0,5 seconde.	Non applicable	
5.9 Actions simultanées de l'utilisateur Dans le cas où la TIC nécessite, pour fonctionner, plusieurs actions simultanées de l'utilisateur, cette TIC propose au moins un mode de fonctionnement qui ne nécessite pas plusieurs actions simultanées de la part de l'utilisateur pour fonctionner.	Pris en charge	

Section 6 TIC avec communication voix bidirectionnelle

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
6.1 Bande passante audio pour la parole (recommandation pour information) Dans le cas où la TIC permet la communication voix bidirectionnelle, elle doit être capable, pour donner une bonne qualité audio, de chiffrer et de déchiffrer la communication voix bidirectionnelle dans une bande de fréquence plafonnée à au moins 7 000 Hz.	Pris en charge	
6.2.1.1 Communication en temps réel par texte (RTT) Dans le cas où la TIC est compatible avec la communication voix bidirectionnelle dans un contexte d'utilisation spécifié, elle permet à un utilisateur de communiquer avec un autre utilisateur en RTT.	Non applicable	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
6.2.1.2 Voix et texte simultanés Dans le cas où la TIC ou les TIC fournies à un utilisateur sont compatibles avec la communication voix bidirectionnelle et permettent à un utilisateur de communiquer avec un autre utilisateur en RTT, elles proposent un mécanisme permettant de sélectionner un mode de fonctionnement qui permet la voix et le texte simultanés.	Non applicable	
6.2.2.1 Affichage visuellement distinguable Dans le cas où la TIC est dotée de capacités d'envoi et de réception en RTT, l'affichage du texte envoyé est visuellement différencié de celui du texte reçu.	Non applicable	
6.2.2.2 Direction envoi/réception déterminable par un programme informatique Dans le cas où la TIC est dotée de capacités d'envoi et de réception en RTT, la direction (envoi/réception) du texte transmis est déterminable par un programme informatique, à moins que le RTT n'ait une fonctionnalité fermée.	Non applicable	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
6.2.3 Interopérabilité Dans le cas où une TIC dotée de la fonctionnalité RTT affiche une interopérabilité avec d'autres TIC dotées de la fonctionnalité RTT (comme l'exige le 6.2.1.1), elles sont compatibles avec au moins un des quatre mécanismes d'interopérabilité RTT décrits ci-dessous : a) TIC inter-opérant sur le Réseau Téléphonique Public (RTC) avec une autre TIC qui se connecte directement au RTC comme décrit dans la Recommandation ITU-T V.18 [i.23] ou l'une de ses annexes pour les signaux de téléphonie en mode texte sur l'interface RTC ; b) TIC inter-opérant avec une autre TIC utilisant la VoIP SIP et utilisant une technologie RTT conforme au document RFC 4103 ; c) TIC inter-opérant avec une autre TIC utilisant une technologie RTT conforme à l'ensemble des protocoles IP Multimedia Sub-System (IMS) spécifiés dans les documents TS 126 114, TS 122 173 et TS 134 229 ; d) TIC inter-opérant avec une autre TIC utilisant une spécification commune adaptée et applicable pour l'échange RTT qui est publiée et peut être consultée. Cette spécification commune comprend une méthode pour indiquer la perte ou de la corruption de caractères.	Non applicable	
6.2.4 Réactivité de la RTT Dans le cas où la TIC utilise la saisie RTT, cette saisie RTT est transmise au réseau TIC compatible RTT dans la seconde qui suit sa saisie.	Non applicable	
6.3 Identification de l'appelant Dans le cas où la TIC propose l'identification de l'appelant et où des fonctions de télécommunications similaires sont proposées, l'identification de l'appelant et les fonctions de télécommunication similaires sont disponibles sous forme de texte et via au moins une autre modalité.	Pris en charge	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
6.4 Alternatives aux services basés sur la voix Dans le cas où la TIC propose la communication voix en temps réel et propose également des fonctions de messagerie vocale, de réception automatique ou de serveur vocal interactif, la TIC doit offrir aux utilisateurs un moyen d'accéder aux informations et d'exécuter les fonctions fournies par la TIC sans utiliser l'audition ou la parole.	Pris en charge	
6.5.2 Résolution Lorsqu'une TIC qui permet la communication voix bidirectionnelle est également dotée d'une fonctionnalité vidéo en temps réel, cette TIC : a) est compatible au moins avec la résolution « QCIF » ; b) doit de préférence être compatible avec au moins la résolution « CIF ».	Pris en charge	
6.5.3 Taux de trame (vitesse d'images) Lorsqu'une TIC qui propose la communication voix bidirectionnelle est dotée d'une fonctionnalité de vidéo en temps réel, cette TIC : a) prend en charge un taux de trame d'au moins 12 images par seconde (IPS) ; b) doit de préférence prendre en charge un taux de trame d'au moins 20 images par seconde (IPS) avec ou sans langue des signes dans le flux de données vidéo.	Pris en charge	
6.5.4 Synchronisation entre le signal audio et le signal vidéo Lorsqu'une TIC qui permet la communication voix bidirectionnelle est dotée d'une fonctionnalité de vidéo en temps réel, cette TIC doit garantir un écart de temps de 100 ms maximum entre la voix et les images présentées à l'utilisateur.	Pris en charge	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
6.6 Alternatives aux services vidéo Dans le cas où la TIC propose la communication vidéo en temps réel et propose également des fonctions de répondeur, de réception automatique ou de réponse interactive, la TIC doit proposer aux utilisateurs un moyen d'accéder aux informations et d'accomplir les tâches associées à ces fonctions : a) pour les informations audibles, sans utilisation de l'audition ; b) pour les commandes vocales, sans utilisation de la voix ; c) pour les informations visuelles, sans utilisation de la vision.	Pris en charge	

Section 7 TIC avec fonctions vidéo

Cette section ne s'applique pas à Microsoft Teams.

Section 8 Matériel informatique

Cette section ne s'applique pas à Microsoft Teams.

Section 9 Web

Cette section ne s'applique pas à Microsoft Teams.

Section 10 Documents non basés dans le Web

Cette section ne s'applique pas à Microsoft Teams.

Section 11 Logiciel

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.1.1.1.1 Contenu non textuel (lecture d'écran prise en charge) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.1.1 Contenu non textuel	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.1.2.1.1 Audio seulement et vidéo seulement (préenregistré) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran et où aucune information sonore préenregistrée n'est nécessaire pour permettre l'utilisation des fonctions fermées de la TIC, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.2.1 Audio seulement et vidéo seulement (préenregistré).	Non-applicable		
11.1.2.2 Sous-titres (préenregistrés) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.2.2 : Sous-titres (préenregistrés).	Non-applicable		
11.1.2.3.1 Audiodescription ou média alternatif (préenregistré) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.2.3 : Audiodescription ou média de remplacement (préenregistré).	Non-applicable		
11.1.2.4 Sous-titres (en direct) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès indiqués WCAG 2.1 dans le Tableau 1.2.4. Sous-titre (en direct).	Non-applicable		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.1.2.5 Audiodescription (préenregistrée) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.2.5 Audiodescription (préenregistrée).	Non-applicable		
11.1.3.1.1 Informations et relations Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.3.1 Informations et relations.	Pris en charge	Les cartes de contact qui ne sont pas lues dans l'onglet Groupes utilisent plutôt l'onglet A-Z qui se trouve à côté.	
11.1.3.2.1 Ordre séquentiel logique Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.3.2 Ordre séquentiel logique.	Pris en charge		
11.1.3.3 Caractéristiques sensorielles Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.3.3 Caractéristiques sensorielles.	Pris en charge		
11.1.3.4 Orientation Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.3.4 Orientation	Non évalué		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.1.3.5 Indentification du motif de la saisie Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.3.5	Non évalué		
11.1.4.1 Utilisation de la couleur Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.4.1 Utilisation de la couleur.	Pris en charge		
11.1.4.2 Contrôle du son Si du contenu audio d'un logiciel est audible automatiquement pendant plus de 3 secondes, il existe un mécanisme pour l'arrêter ou le mettre en pause, ou alors il existe un mécanisme pour contrôler le volume audio indépendamment du volume du système général.	Pris en charge		
11.2.1.12 Contraste (minimum) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.4.3 Contraste (minimum)> .	Pris en charge avec des exceptions	Différents textes accessoires dans l'interface utilisateur ont un rapport de contraste inférieur à 4,5: 1 par rapport à l'arrière-plan.	
11.1.4.4.1 Redimensionner le texte Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui permet l'accès aux fonctions d'agrandissement de la plate-forme ou de la technologie d'assistance, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 1.4.4 Redimensionner le texte.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.1.4.5.1 Images de texte Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le tableau 11.14 Images de texte.	Pris en charge		
11.1.4.10.1 Redistribution Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, le contenu peut être présenté sans perte d'information ou de fonctionnalité, et sans qu'il soit nécessaire de le faire défiler en deux dimensions : • Contenu défilant verticalement sur une largeur équivalente à 320 pixels CSS ; • Contenu défilant horizontalement à une hauteur équivalente à 256 pixels CSS ; Sauf pour les parties du contenu qui nécessitent une mise en page bidimensionnelle pour l'utilisation ou la signification.	Non évalué		
11.1.4.11 Contraste non textuel Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le tableau 1.4.11 Contraste non textuel.	Non évalué		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.1.4.12 Espacement du texte Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui n'a pas de zone de mise en page de taille fixe essentielle pour que l'information soit transmise, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le tableau 1.4.12 Espacement du texte.	Non évalué		
11.1.4.13 Passer le curseur ou focaliser Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le tableau 1.4.13 Passer le curseur ou focaliser	Non évalué		
11.2.1.1.1 Clavier Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui permet l'accès aux claviers ou à une interface clavier, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 2.1.1 Clavier.	Pris en charge avec des exceptions	• Le retour à l'appel à partir de la notification n'est pas pris en charge. Pour revenir à l'appel, il convient d'utiliser le moniteur d'appel situé dans la fenêtre principale de l'application. • Les infobulles d'écran n'apparaissent pas lorsque le clavier est centré sur les icônes.	
11.2.1.16 Pas de piège au clavier Si le focus du clavier peut être positionné sur un composant du logiciel à l'aide d'une interface clavier, réciproquement, il peut être déplacé hors de ce même composant simplement à l'aide d'une interface clavier et, si ce déplacement exige plus que l'utilisation d'une simple touche flèche ou tabulation ou toute autre méthode standard de sortie, l'utilisateur est informé de la méthode permettant de déplacer le focus hors de ce composant.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.2.1.4.1 Raccourcis touches de caractère Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 2.1.4 Raccourcis touches de caractère.	Non évalué		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.2.2.1 Réglage du délai Pour chaque délai qui est fixé par le logiciel, au moins l'un des points suivants est vrai : • Suppression : l'utilisateur est autorisé à supprimer la limite de temps avant de la dépasser; ou • Ajustement : l'utilisateur est autorisé à ajuster la limite de temps avant de la dépasser dans un intervalle d'au moins dix fois la durée paramétrée par défaut ; ou • Prolongation : l'utilisateur est averti avant que la limite de temps n'expire et il lui est accordé au moins 20 secondes pour prolonger cette limite par une action simple (par exemple, « appuyer sur la barre d'espace ») et l'utilisateur est autorisé à prolonger la limite de temps au moins dix fois ; ou • L'exception du temps réel : la limite de temps est une partie constitutive d'un événement en temps réel (par exemple, une enchère) et aucune alternative n'est possible ; ou • L'exception de la limite essentielle : la limite de temps est essentielle et la prolonger invaliderait alors l'activité ; ou • L'exception des 20 heures : la limite de temps est supérieure à 20 heures.	Non applicable		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.2.2.2 Mettre sur pause, arrêter, masquer Pour toute information en mouvement, clignotante, défilante ou mise à jour automatiquement, tous les points suivants sont vrais : Déplacement, clignotement, défilement : pour toute information en mouvement, clignotante ou défilante qui (1) démarre automatiquement, (2) dure plus de cinq secondes et (3) est présentée conjointement avec un autre contenu, l'utilisateur dispose d'un mécanisme pour la mettre en pause, l'arrêter ou la masquer, à moins que le mouvement, le clignotement ou le défilement s'avère un élément essentiel au bon déroulement de l'activité ; et Mise à jour automatique : pour toute information mise à jour automatiquement qui (1) démarre automatiquement et (2) est présentée conjointement avec un autre contenu, l'utilisateur dispose d'un mécanisme pour la mettre en pause, l'arrêter ou pour contrôler la fréquence des mises à jour à moins que la mise à jour automatique s'avère essentielle au bon déroulement de l'activité.	Pas pris en charge	L'arrêt des GIF animés n'est pas pris en charge	
11.2.3.1 Pas plus de trois flashs ou sous le seuil critique Le logiciel est exempt de tout élément qui flashe plus de trois fois dans n'importe quel intervalle d'une seconde ou ce flash doit se situer sous le seuil de flash générique et le seuil de flash rouge.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.2.4.3 Parcours du focus Si un logiciel peut être parcouru de façon séquentielle et que les séquences de navigation affectent la signification ou l'action, les éléments reçoivent le focus dans un ordre qui préserve la signification et l'opérabilité.	Pris en charge		
11.2.4.4 Fonction du lien (selon le contexte) Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 2.4.4 Fonction du lien (selon le contexte).	Pris en charge		
11.2.4.6 En-têtes et étiquettes Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 2.4.6 En-têtes et étiquettes.	Pris en charge	Les messages et les chaînes de réponse sont marqués comme titres pour une navigation efficace. Prise en charge de l'accessibilité pour les équipes Microsoft.	
11.2.4.7 Visibilité du focus Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le 2.4.7 Visibilité du focus.	Pris en charge		
11.2.5.1 Mouvements du curseur Toutes les fonctionnalités qui utilisent des mouvements multipoints ou basés sur des trajectoires pour l'opération peuvent être utilisées avec un seul curseur sans geste basé sur une trajectoire, à moins qu'un mouvement multipoints ou basé sur une trajectoire soit essentiel.	Non évalué		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.2.5.2 Annulation du curseur Pour les fonctionnalités qui peuvent être commandées à l'aide d'un seul curseur, au moins l'un des points suivants est vrai : • Pas d'événement bas : L'événement bas du curseur n'est pas utilisé pour exécuter une partie de la fonction ; • Abandonner ou Annuler : L'exécution de la fonction est en cours d'exécution et un mécanisme permet d'interrompre la fonction avant la fin ou d'annuler la fonction après la fin ; • événement haut : L'événement haut annule tout résultat de l'événement bas précédent ; • Essentiel : Il est essentiel de compléter la fonction sur l'évènement bas	Non évalué		
11.2.5.3 Nom de l'étiquette Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le 2.5.3 Nom de l'étiquette.	Non évalué		
11.2.5.4 commande de mouvement Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le 2.5.4 Commande de mouvement	Non évalué		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.3.1.1.1 Langue du logiciel Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, le langage humain par défaut du logiciel peut être déterminé par un programme informatique.	Pris en charge		
11.3.2.1 Au focus Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 3.2.1Au focus.	Pris en charge avec exceptions	En passant la souris sur la carte d'un contact, vous placez le curseur du clavier à l'intérieur de la carte.	
11.3.2.2 À la saisie Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 3.2.2 À la saisie.	Pris en charge		
11.3.3.1.1 Identification des erreurs Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur et qui prend en charge l'accès aux technologies d'assistance pour la lecture d'écran, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 3.3.1 Identification des erreurs.	Pris en charge		
11.3.3.3 Étiquettes ou instructions Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 3.2.2 Étiquettes ou instructions.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.3.3.3 Suggestion après une erreur Dans le cas où la TIC est un logiciel non-web qui est doté d'une interface utilisateur, elle remplit les Critères de Succès WCAG 2.1 indiqués dans le Tableau 3.3.3 Suggestion après une erreur.	Pris en charge		
11.3.3.4 Prévention des erreurs (juridiques, financières, de données) Pour les logiciels qui entraînent des obligations légales ou des transactions financières de la part de l'utilisateur, qui modifient ou effacent des données contrôlables par l'utilisateur dans des systèmes de stockages de données ou qui enregistrent les réponses de l'utilisateur à des tests, au moins l'une des conditions suivantes est vraie : 1. Réversibilité : les soumissions sont réversibles. 2. Vérification : les données saisies par l'utilisateur sont vérifiées au niveau des erreurs de saisie et la possibilité est donnée à l'utilisateur de les corriger. 3. Confirmation : un mécanisme est disponible pour examiner, confirmer et corriger les informations avant de finaliser leur soumission.	Non applicable		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.4.1.1.1 Analyse syntaxique Pour un logiciel qui utilise des suivis de modification de langue de telle manière que le suivi est indiqué séparément et à la disposition des technologies d'assistance et caractéristiques d'accessibilité du logiciel ou d'un agent utilisateur sélectionnable par un utilisateur, les éléments ont des suivis de modification de début et de fin complètes, ils sont imbriqués conformément à leurs spécifications, ils ne contiennent pas d'attributs dupliqués et chaque ID est unique, sauf dans le cas où les spécifications autorisent ces caractéristiques.	Pris en charge		
11.4.1.2.1 Nom, rôle et valeur Pour tout composant d'une interface utilisateur (et notamment des éléments de formulaire, liens et composants générés par des scripts), le nom et le rôle peuvent être déterminés par un programme informatique ; les états, les propriétés et les valeurs qui peuvent être paramétrés par l'utilisateur peuvent être définis par un programme informatique ; et la notification des changements de ces éléments est mise à la disposition des agents utilisateurs, et notamment des technologies d'assistance.	Pris en charge avec des exceptions	La sélection « état de la réunion » depuis la liste de réunion n'est pas apparente du point de vue de la programmation. Il convient d'utiliser le bon contenu de l'application ou le bon titre de la fenêtre pour vérifier. • Certaines des informations complémentaires résultant de l'action de l'utilisateur lors d'une réunion ne sont pas automatiquement lues par les lecteurs. • La possibilité d'ajouter du texte alt. à une image n'est pas supportée • Le contenu d'iFrame/webview n'est pas accessible avec les lecteurs d'écran. Utilisez plutôt Teams web.	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.2.1 Prise en charge du service d'accessibilité de la plate-forme pour les logiciels qui fournissent une interface utilisateur Les logiciels de plate-forme fournissent un ensemble de services de plate-forme documentés qui permettent aux logiciels qui fournissent une interface utilisateur fonctionnant sur le logiciel de plate-forme d'interagir avec la technologie d'assistance. Le logiciel de la plate-forme devrait prendre en charge les exigences 11.5.2.5 à 11.5.2.2.17, sauf que, lorsqu'un concept d'interface utilisateur correspondant à l'une des clauses 11.5.2.5 à 11.5.2.17 n'est pas pris en charge par l'environnement logiciel, ces exigences ne sont pas applicables. Par exemple, les attributs de sélection de 11.5.2.14 (Modification des attributs de focalisation et de sélection) peuvent ne pas exister dans les environnements qui ne permettent pas la sélection, qui est le plus souvent associée au copier-coller.	Non applicable		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.2 Prise en charge des services d'accessibilité de la plate-forme les technologies d'assistance Le logiciel de la plate-forme fournit un ensemble de services d'accessibilité de plate-forme documentés qui permettent aux technologies d'assistance d'interagir avec un logiciel doté d'une interface utilisateur fonctionnant sur le logiciel de la plate-forme. Le logiciel de la plate-forme doit être compatible avec les exigences des clauses 11.5.2.5 à 11.5.2.17 étant toutefois entendu que, dans le cas où le concept d'une interface utilisateur qui correspond à l'une des clauses 11.5.2.5 à 11.5.2.17 n'est pas compatible avec l'environnement logiciel, ces exigences ne s'appliquent pas. Par exemple, les attributs de sélection du 11.5.2.14 (Modification du focus et attributs de sélection) peuvent ne pas exister dans les environnements qui ne permettent pas la sélection, ce qui est le souvent le cas de la fonction copier-coller.	Non applicable		
11.5.2.3 Utilisation des services d'accessibilité Dans le cas où le logiciel présente une interface utilisateur, il utilisera les services documentés d'accessibilité applicables de la plate-forme. Si ces services documentés d'accessibilité de la plate-forme ne permettent pas au logiciel de remplir les exigences applicables des clauses 11.5.2.5 à 11.5.2.17, alors un logiciel qui est doté d'une interface utilisateur utilise d'autres services documentés pour interagir avec la technologie d'assistance.	Voir sections 11.5.2.5 à 11.5.2.17		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.4 Technologie d'assistance Dans le cas où la TIC est une technologie d'assistance, elle utilise les services documentés d'accessibilité de la plate-forme.	Non applicable		
11.5.2.5 Informations relatives à l'objet Dans le cas où le logiciel présente une interface utilisateur il rendra, en utilisant les services décrits dans la clause 11.3.2.3, le rôle, l'état ou les états, la frontière, le nom et la description des éléments de l'interface utilisateur déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		
11.5.2.6 Ligne, Colonne et titres Dans le cas où le logiciel présente une interface utilisateur, il rendra, à l'aide des services décrits dans la clause 11.5.2.3, la ligne et la colonne de chaque cellule d'un tableau de données, y compris les titres de la colonne et de la ligne s'il y en a, déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		
11.5.2.7 Valeurs Dans le cas où le logiciel présente une interface utilisateur, il rendra, à l'aide des services décrits dans la clause 11.5.2.3, la valeur actuelle d'un élément de l'interface utilisateur et toutes valeurs minimales ou maximales de la fourchette, si l'élément de l'interface utilisateur transmet des informations sur une fourchette de valeurs, déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.8 Relations des étiquettes Dans le cas où le logiciel présente une interface utilisateur, il exposera la relation qu'un élément de l'interface utilisateur a en tant qu'étiquette d'un autre élément, ou en tant qu'élément étiqueté par un autre élément, à l'aide des services décrits dans la clause 11.5.2.3, de sorte que ces informations soient déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		
11.5.2.9 Relations parent-enfant Dans le cas où le logiciel présente une interface utilisateur, il rendra, à l'aide des services décrits dans la clause 11.5.2.3, la relation entre un élément de l'interface utilisateur et des éléments parent ou enfant déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		
11.5.2.10 Texte Dans le cas où le logiciel présente une interface utilisateur, il rendra, à l'aide des services décrits dans la clause 11.5.2.3, les contenus textuels, les attributs textuels et la frontière du texte qui apparaît à l'écran, déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.11 Liste des actions disponibles Dans le cas où le logiciel présente une interface utilisateur, il rendra, à l'aide des services décrits dans la clause 11.5.2.3, une liste des actions disponibles qui peuvent être exécutées sur un élément de l'interface utilisateur déterminable par un programme informatique par les technologies d'assistance.	Pris en charge		
11.5.2.12 Exécution des actions disponibles Quand les exigences de sécurité l'autorisent, un logiciel qui est doté d'une interface utilisateur autorise, en utilisant les services décrits dans la clause 11.5.2.3, l'exécution programmatique des actions exposées conformément à la clause 11.5.2.11 par les technologies d'assistance.	Pris en charge		
11.5.2.13 Suivi du focus et des attributs de sélection Dans le cas où le logiciel est doté d'une interface utilisateur, il rendra, à l'aide des services décrits dans la clause 11.5.2.3, les informations et mécanismes nécessaires pour suivre le focus, le point d'insertion du texte et les attributs de sélection des éléments de l'interface utilisateur, déterminables par un programme informatique par les technologies d'assistance.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.14 Modification du focus et des attributs de sélection Quand les exigences de sécurité l'autorisent, un logiciel qui est doté d'une interface utilisateur autorise, en utilisant les services décrits dans la clause 11.5.2.3, les technologies d'assistance à modifier par un programme informatique le focus, le point d'insertion du texte et les attributs de sélection des éléments de l'interface utilisateur dans la mesure où l'utilisateur peut les modifier.	Pris en charge		
11.5.2.15 Notification des changements Dans le cas où le logiciel est doté d'une interface utilisateur, il avisera, à l'aide des services décrits dans la 11.5.2.3, les technologies d'assistance de toute modification des attributs des éléments de l'interface utilisateur déterminables par un programme informatique qui sont référencés dans les exigences 11.5.2.5 à 11.5.2.11 et 11.5.2.13.	Pris en charge		
11.5.2.16 Modifications de l'état et des propriétés Quand les exigences de sécurité l'autorisent, un logiciel qui est doté d'une interface utilisateur autorise les technologies d'assistance, en utilisant les services décrits dans la clause 11.5.2.3, à modifier par un programme informatique l'état et les propriétés des éléments de l'interface utilisateur, dans la mesure où l'utilisateur peut les modifier.	Pris en charge		

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.5.2.17 Modifications des valeurs et du texte Quand les exigences de sécurité l'autorisent, un logiciel qui est doté d'une interface utilisateur autorise les technologies d'assistance, en utilisant les services décrits dans la 11.5.2.3, à modifier les valeurs et le texte des éléments de l'interface utilisateur à l'aide des méthodes de saisie de la plate-forme, dans le cas où un utilisateur peut les modifier sans utiliser de technologie d'assistance.	Pris en charge		
11.6.1 Contrôle par l'utilisateur des caractéristiques d'accessibilité Dans le cas où un logiciel est une plate-forme, il propose des modes d'utilisation suffisants pour permettre un contrôle de l'utilisateur sur les caractéristiques d'accessibilité de la plate-forme qui sont documentées comme étant destinées aux utilisateurs.	Non applicable		
11.6.2 Pas de perturbation des caractéristiques d'accessibilité Dans le cas où le logiciel est doté d'une interface utilisateur, il ne perturbe pas les caractéristiques d'accessibilité documentées qui sont définies dans la documentation relative à la plate-forme sauf si l'utilisateur le demande en cours de fonctionnement du logiciel.	Pris en charge avec exceptions	• Pour un thème à contraste élevé, utilisez le thème fourni dans l'application à partir de la boîte de dialogue Paramètres. • Le paramètre de désactivation de l'animation fourni dans la plate-forme n'est pas pris en charge	

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
11.7 Préférences de l'utilisateur Dans le cas où le logiciel est doté d'une interface utilisateur, il propose des modes d'utilisation suffisants qui utilisent les préférences de l'utilisateur pour les paramètres de la plate-forme (couleur, contraste, police, taille de la police et curseur de focus), à l'exception des logiciels qui sont destinés à être isolés de la plate-forme à laquelle ils appartiennent.	Pris en charge avec exceptions	• Pour un thème à contraste élevé, utilisez le thème fourni dans l'application à partir de la boîte de dialogue Paramètres. • Le paramètre de désactivation de l'animation fourni dans la plate-forme n'est pas pris en charge	
11.8.2 Création de contenu accessible Les systèmes auteurs permettent et guident la production de contenu conforme aux clauses 9 (Contenu Web) ou 10 (Contenu non-web) telles qu'applicables.	Pris en charge avec exceptions	La possibilité d'ajouter du texte alt. pour les images n'est pas prise en charge	
11.8.3 Préservation des informations sur l'accessibilité dans le cadre des transformations Si le système auteur assure des transformations de restructuration ou des transformations de recodage, alors les informations sur l'accessibilité sont préservées dans le résultat s'il existe des mécanismes équivalents dans la technologie du contenu du résultat.	Non applicable		
11.8.4 Assistance à la réparation Si la fonctionnalité de contrôle de l'accessibilité d'un système auteur peut détecter que le contenu ne remplit pas une exigence des clauses 9 (Web) ou 10 (Documents non-web) selon le cas, alors le système auteur présente une ou plusieurs suggestions de réparation. Non applicable			

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS	
1186.5 Modèles Quand un système auteur propose des modèles, au moins un modèle prenant en charge la création de contenu conforme aux exigences des clauses 9 (Web) ou 10 (Documents non-web), selon le cas, est disponible et identifié comme tel.	Non applicable		

Section 11 Logiciels - Fonctionnalité fermée Cette section ne s'applique pas à Microsoft Teams.

Section 12 Documentation et services d'assistance

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
12.1.1 Caractéristiques d'accessibilité et de compatibilité La documentation produit fournie avec la TIC, qu'elle soit fournie séparément ou intégrée dans la TIC, dresse la liste des caractéristiques d'accessibilité et de compatibilité de la TIC et explique comment les utiliser.	Pris en charge	
12.1.2 Documentation accessible La documentation produit fournie avec la TIC est mise à disposition dans au moins un des formats électroniques suivants : a) un format web qui est conforme à la clause 9, ou b) un format non-web qui est conforme à la clause 10.	Pris en charge	
12.2.2 Informations sur les caractéristiques d'accessibilité et de compatibilité Les services d'assistance de la TIC communiquent des informations sur les caractéristiques d'accessibilité et de compatibilité qui sont mentionnées dans la documentation produit.	Pris en charge	
12.2.3 Efficacité de la communication Les services d'assistance de la TIC répondent aux besoins en communication des personnes porteuses de handicap directement ou depuis un point de référence.	Pris en charge	Disability Answer Desk

CRITÈRES	FONCTIONNALITÉS PRISES EN CHARGE	REMARQUES ET EXPLICATIONS
12.2.4 Documentation accessible La documentation fournie par les services d'assistance est mise à disposition dans au moins un des formats électroniques suivants : a) un format Web qui est conforme à la clause 9, ou b) un format non-web qui est conforme à la clause 10.	Pris en charge	

Section 13 TIC assurant le relais ou l'accès à des services d'urgence

Cette section ne s'applique pas à Microsoft Teams.

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La personnalisation du produit annule la présente déclaration de conformité de Microsoft. Les clients ont la possibilité de faire des déclarations de conformité indépendantes s'ils ont contrôlé avec toute la diligence raisonnable nécessaire que les mesures de personnalisation qu'ils ont prises remplissent toutes les exigences.

Pour en savoir plus sur les spécifications de compatibilité de produits de technologie d'assistance spécifiques, consultez vos fournisseurs de technologies d'assistance.

Le présent document n'est pas la norme EN 301 549 v 2.1.2 (2018-08) et ne doit pas être utilisé en remplacement de celle-ci. Les extraits de la norme EN 301 549 v 2.1.2 qu'il contient ne sont référencés que pour décrire la conformité de Microsoft avec certaines de ses dispositions. Un exemplaire complet de la norme EN 301 549 v 2.1.2 (2018-08) est disponible émanant de l'European Telecommunications Standards Institute (ETSI), du Comité Européen de Normalisation et du Comité Européen de Normalisation Électrotechnique.

Le présent document est fourni à titre indicatif. MICROSOFT NE FOURNIT AUCUNE GARANTIE, EXPRESSE OU TACITE, DANS LE PRÉSENT DOCUMENT.

Related topics

Accessibility solutions for Skype for Business Online in France

Accessibility solutions for Skype for Business Online and Microsoft Teams in France

11/2/2020 • 5 minutes to read • Edit Online

Rapport sur les actions engagées par Microsoft pour favoriser l'accès des personnes en situation de handicap aux communications électroniques

Fournir des expériences accessibles à tous est au cœur de la mission de Microsoft, qui consiste à permettre à chaque personne et à chaque organisation de la planète d'accomplir davantage. Microsoft offre un certain nombre de fonctionnalités d'accessibilité pour Skype Entreprise et Microsoft Teams qui s'inscrivent dans son engagement fort en faveur de l'accessibilité et de l'inclusion.

Accessibilité pour Microsoft Teams et Skype Entreprise

Vue d'ensemble

Microsoft Teams et Skype for Business dans Office 365 sont des outils de collaboration sur le lieu de travail avec des fonctions de conversation, de vidéoconférence et d'appel. Chacune de ces plateformes comprend des fonctionnalités d'accessibilité pour faciliter la communication des utilisateurs ayant une déficience visuelle, une dextérité limitée ou d'autres handicaps. Un résumé de ces fonctionnalités est disponible sur le site web Accessibilité de Microsoft Teams https://support.office.com/fr-fr/article/prise-en-charge-de-l-accessibilit%C3%A9-dans-microsoft-teams-d12ee53f-d15f-445e-be8d-f0ba2c5ee68f?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR et sur le site web Accessibilité de Skype Entreprise https://support.office.com/fr-fr/article/prise-en-charge-de-l-accessibilit%C3%A9-dans-skype-entreprise-fbe39411-6f25-405d-acb4-861735865d18?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR. Pour une description plus détaillée des fonctionnalités d'accessibilité de Microsoft Teams et de Skype Entreprise, nous vous invitons à lire ce qui suit.

Fonctionnalités d'accessibilité

Microsoft Teams fournit des pages d'aide avec des raccourcis clavier et des instructions de navigation pour les utilisateurs de lecteurs d'écran :

- Raccourcis clavier pour appeler, envoyer des messages et naviguer dans Microsoft Teams https://support.office.com/fr-fr/article/raccourcis-clavier-de-microsoft-teams-2e8e2a70-e8d8-4a19-949b-4c36dd5292d2?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Utilisation d'un lecteur d'écran pour créer et modifier des équipes pour les conversations dans Microsoft Teams https://support.office.com/fr-fr/article/utiliser-un-lecteur-d-%C3%A9cran-pour-cr%C3%A9er-des-%C3%A9quipes-dans-microsoft-teams-fcd5a839-0458-47d2-9688-7cffb66779c5?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Comment envoyer des messages privés ou chatter dans Microsoft Teams à l'aide d'un lecteur d'écran https://support.office.com/fr-fr/article/utiliser-un-lecteur-d-%C3%A9cran-pour-envoyer-un-message-ou-discuter-en-priv%C3%A9-dans-microsoft-teams-c99901c9-00dc-44d4-8921-4aa120bf298b?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Utilisation d'un lecteur d'écran pour trouver et répondre aux alertes dans Microsoft Teams https://support.office.com/fr-fr/article/utiliser-un-lecteur-d-%C3%A9cran-pour-rechercher-des-alertes-et-y-r%C3%A9pondre-dans-microsoft-teams-8290757e-789d-4e5a-a2ac-9ae4a07d55c2?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR

Microsoft Teams permet désormais aux utilisateurs de brouiller leur arrière-plan ou d'utiliser une image de fond

pendant les réunions, ce qui peut être utile aux personnes malentendantes qui ont du mal à lire sur les lèvres et à celles qui peuvent être facilement distraites par un environnement actif: https://support.office.com/fr-fr/article/rendre-votre-arrière-plan-flou-dans-une-réunion-en-équipe-f77a2381-443a-499d-825e-509a140f4780?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR. Les utilisateurs de Microsoft Teams peuvent gérer les notifications par le biais des paramètres, désactiver entièrement les notifications en activant le mode "Ne pas déranger", et masquer, mettre en sourdine et épingler les discussions, tout cela contribuant à minimiser les distractions et à aider l'utilisateur à se concentrer dans un environnement très actif. La possibilité d'activer la suppression du bruit en temps réel pour réduire le bruit de fond pendant les réunions sera ajoutée.

Microsoft Teams a introduit une fonction "lever la main" qui permettra à toute personne participant à une réunion Microsoft Teams d'envoyer un signal visuel indiquant qu'elle a quelque chose à dire, utile à tous les utilisateurs qui souhaitent participer pleinement aux discussions de la réunion, y compris les personnes souffrant de troubles de la parole.

Microsoft Teams permet aux utilisateurs d'épingler et de recadrer les vidéos et de passer de la visualisation du contenu partagé pendant une réunion à celle des personnes qui y participent, ce qui peut être utile aux personnes malentendantes qui lisent sur les lèvres ou utilisent un interprète en langue des signes. Les utilisateurs peuvent également envoyer des messages audio et utiliser la technologie de dictée assistée par Microsoft Windows pour convertir la parole en texte, ce qui peut aider les personnes malvoyantes et malentendantes à communiquer avec les autres participants à la réunion.

En outre, la fonction de chat des équipes de Microsoft Teams est compatible avec un large éventail de technologies d'assistance, notamment les lecteurs d'écran, les logiciels de dictée, le contrôle visuel (sous Windows 10), le contrôle vocal (sous iOS et Android), les agrandisseurs d'écran et les commutateurs d'accès (sous iOS et Android).

Skype Entreprise dans Office 365 prend également en charge diverses fonctionnalités d'accessibilité. Pour les personnes qui utilisent des lecteurs d'écran, l'interface utilisateur de Skype Entreprise peut être parcourue à l'aide du clavier, et des pages d'aide sont fournies pour expliquer :

- les raccourcis clavier dans Skype Entreprise https://support.office.com/fr-fr/article/Raccourcis-clavier-dans-Skype-entreprise-42ff538f-67f2-4752-afe8-7169c207f659?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Comment ajouter des personnes à la liste de contacts en utilisant Skype Entreprise avec un lecteur d'écran https://support.office.com/fr-fr/article/Ajouter-des-personnes-%c3%a0-vos-contacts-avec-Skype-Entreprise-et-un-lecteur-d-%c3%a9cran-669b53a4-9dd1-4506-8fe2-aee42d8bafe8?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Comment passer ou recevoir un appel dans Skype Entreprise à l'aide d'un lecteur d'écran https://support.office.com/fr-fr/article/Passer-ou-recevoir-un-appel-%c3%a0-l-aide-de-Skype-Entreprise-avec-un-lecteur-d-%c3%a9cran-d73b5b49-080f-436f-802c-208b958204e4?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Comment utiliser un lecteur d’écran avec Skype Entreprise pour consulter la messagerie vocale https://support.office.com/fr-fr/article/Utiliser-un-lecteur-d-%c3%a9cran-avec-Skype-Entreprise-pour-consulter-la-messagerie-vocale-6e2f9f74-980b-42c7-92d8-e2afbe69b7d9?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Comment envoyer un message instantané dans Skype Entreprise à l'aide d'un lecteur d'écran https://support.office.com/fr-fr/article/Envoi-d-un-message-instantan%c3%a9-dans-Skype-Entreprise-%c3%a0-l-aide-d-un-lecteur-d-%c3%a9cran-e7059839-94fb-4f73-92b4-76de51133f2e?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR
- Comment participer à une réunion en ligne en utilisant Skype Entreprise avec un lecteur d'écran https://support.office.com/fr-fr/article/Participer-%c3%a0-une-r%c3%a9union-en-ligne-avec-Skype-Entreprise-et-un-lecteur-d-%c3%a9cran-68e8a11a-8796-4ce9-89d6-38a15b6da456?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR

- Comment partager son écran en utilisant Skype Entreprise avec un lecteur d'écran https://support.office.com/fr-fr/article/Partager-votre-%c3%a9cran-avec-Skype-Entreprise-et-un-lecteur-d-%c3%a9cran-678ce631-1499-4a24-8d32-a68498ce9ff4?omkt=fr-FR&ui=fr-FR&rs=fr-FR&ad=FR

Lorsque vous utilisez Skype Entreprise, les menus interactifs de réponse vocale peuvent être ralentis, accélérés et redémarrés, et les utilisateurs peuvent choisir de sauter des messages, et Microsoft Teams prend en charge le réglage de la vitesse de la boîte vocale. Microsoft Teams et Skype Entreprise prennent en charge les appels textes (TTY). Les utilisateurs de Skype Entreprise utilisant Outlook 2010 ou des versions plus récentes peuvent choisir de recevoir leurs messages vocaux au format texte, ce qui peut être bénéfique pour les personnes malentendantes ou sourdes : https://support.microsoft.com/fr-fr/office/consultation-de-la-messagerie-vocale-et-des-options-de-skype-entreprise-2deea7f8-831f-4e85-a0d4-b34da55945a8?ui=fr-fr&rs=fr-fr&ad=fr. Les administrateurs informatiques de Microsoft Teams peuvent gérer la transcription pour leurs clients. Pour une lecture plus facile, Microsoft Teams prend en charge le zoom et Skype Entreprise permet d'ajuster la taille du texte des messages instantanés.

Les pages consacrées à chacune de ces plates-formes décrivent comment se présentent généralement Skype Entreprise et Microsoft Teams sur les appareils qui prennent en charge ces plates-formes, telles que Windows, Mac, iOS et Android. Les descriptions de des agencements de Skype Entreprise peuvent être particulièrement utiles aux utilisateurs aveugles, malvoyants ou à mobilité réduite pour les aider à construire une représentation mentale des points de repère des interfaces utilisateur (IU) afin de faciliter la navigation dans l'IU.

La reconnaissance vocale de Windows peut également aider les personnes à mobilité réduite et bénéficier de l'utilisation de commandes vocales plutôt que du clavier ou de la souris. Les instructions pour activer la reconnaissance vocale sur un ordinateur fonctionnant sous Windows 10 sont disponibles ici : https://support.microsoft.com/fr-fr/help/17208/windows-10-use-speech-recognition.

Assistance client

Afin d'offrir la meilleure expérience possible à tous nos clients, Microsoft propose une assistance technique pour les questions liées à l'accessibilité par l'intermédiaire de son bureau de réponse aux questions des personnes handicapées. L'équipe d'assistance du Answer Desk Accessibilité est formée à l'utilisation de nombreuses technologies d'assistance populaires et peut offrir une assistance en français par téléphone ou par chat : https://support.microsoft.com/fr-fr/accessibility/disability-answer-desk.

Déclarations de conformité à la norme EN 301 549

Pour aider ses clients à évaluer l'accessibilité, Microsoft propose une documentation qui décrit comment Skype Entreprise et Microsoft Teams se conforment à la norme européenne EN 301 549 relative aux exigences d'accessibilité applicables aux marchés publics des produits et services liés aux TIC (Technologies de l'Information et de la Communication) en Europe. Des copies des rapports EN 301 549 sont jointes en annexes.

Calling plans in Microsoft 365 - Code of practice for the United Kingdom (U.K.)

6/10/2020 • 7 minutes to read • Edit Online

This Code applies to small business customers (organizations with 10 employees or less) in the United Kingdom (UK) with respect to the Microsoft 365 or Office 365 Calling Plan service (the "Service") in accordance with UK communications regulations. Other Skype for Business services are governed by your service agreement with Microsoft and any other terms applicable to your use of the particular service.

1. About Skype for Business

Skype for Business is provided in the UK by Microsoft Ireland Operations Limited, which has its registered office at 70 Sir John Rogerson's Quay, Dublin 2, Ireland.

2. Customer service

If you have any sales, billing, or technical support questions, you may contact us either by phone during normal business hours or online:

Toll-Free Phone Number: 0800 032 6417

Online: Sign in to the Microsoft 365 admin center and submit a service request by selecting **New service request** under **Support**.

Normal business hours are Monday through Friday, from 9:00 am to 5:00 pm.

You may be able to answer some of your questions by visiting the Skype for Business website.

3. Complaints and dispute resolution

Our top priorities are customer satisfaction and excellent service. However, in the event that you have a complaint, we will work quickly to help you resolve your issue. Our Calling Plans in Microsoft 365 or Office 365 - complaint handling code for the United Kingdom (U.K.) page details the procedures for small businesses to file a complaint with us and our independent dispute resolution scheme.

4. Number porting

Skype for Business in some cases may be unable to transfer a customer's telephone number for use with the Service. Where number portability is available, Skype for Business will take all reasonable steps to ensure that the transfer of the number and subsequent activation is completed promptly once an agreement to transfer the number has been reached with the customer's current service provider.

5. Service reliability

Microsoft 365 or Office 365 Calling Plan relies on your broadband connection. If your broadband connection experiences a power cut or failure, you will not be able to make telephone calls. The causes for these failures may be outside of our control.

6. Emergency calls

Skype for Business provides access to 999/112 public emergency call services to customers within England, Wales,

Scotland and Northern Ireland. However, emergency calls to 999 or 112 operate differently with Microsoft 365 or Office 365 Calling Plan services than on traditional telephone services. Customers are required to notify each user of the Microsoft 365 or Office 365 Calling Plan services of these differences.

The differences include the following: (i) Skype for Business may not know the actual location of a caller, which could result in the emergency services being despatched to the wrong location; (ii) when a Skype for Business user dials an emergency call, the user may be asked by an operator to provide his or her current location to assist in properly routing the emergency call and despatching emergency services; (iii) if the user's device has no power, is experiencing a power outage or, for any reason, cannot otherwise access the Internet, the user cannot make an emergency call through Microsoft 365 or Office 365 Calling Plan services; and (iv) although Microsoft 365 and Office 365 Calling Plan services can be used anywhere in the world where an Internet connection is available, users should not call 999 or 112 outside England, Wales, Scotland or Northern Ireland because the call likely will not be routed to the appropriate emergency service.

It is important that each customer registers the location of your users and keeps this information updated so that it can be provided to the emergency services. You can make changes to location information online through the Skype for Business administrator portal.

7. Refund policy

Our refund policy is stated in your service agreement.

8. Contract terms and conditions

Standard contract conditions for the Service are provided in your service agreement.

9. Subscription fees and charges

Information about subscription plans and usage charges (including Premium Rate Services and National Translation Services number charges) can be found on Skype for Business website.

10. Directory listing

If you would like a Directory Enquiry listing (including an entry in the Phone Book) for your telephone number, it can be provided for an additional fee. For further details, please contact us using our contact information provided in Section 2.

11. Users with disabilities

This Code and the Complaints Handling Code are available in large print or audio format.

12. Premium rate services

What are premium rate services?

Premium Rate Services are telephone numbers that render information and entertainment that are charged to your telephone bill. Premium Rate Services include, but are not limited to, charity donations, voting lines (i.e. Britain's Got Talent), directory enquiries, gambling lines, and adult services lines (i.e. dating). Calls to Premium Rate Services are more expensive than calls to other landline numbers and begin with 0871, 0872, 0873, 118, and 09.

Premium Rate Services are delivered by service providers ("Service Providers"). Service Providers either (a) provide the goods or services or (b) act as resellers or aggregators on behalf of a number of such providers.

How do premium rate services work?

Skype for Business sends your Premium Rate Services call to another telephone company ("Terminating

Communications Provider") which receives the call on behalf of the Services Provider. While Premium Rate Services revenue is divided amongst the Services Provider, Skype for Business, and the Terminating Communications Provider, most of the revenue is received by the Services Provider.

Charges

All usage charges for Premium Rate Services can be found on our website. The duration of a call for calling premium rate numbers shall be based on one-minute increments. Fractions of minutes will be rounded up to the next minute. The connection fee, where applicable, will be charged at the beginning of the call.

Telephone preference service and fax preference services

Telephone Preference Service ("TPS"), which is operated by the Direct Marketing Association on behalf of Ofcom, is a register that enables customers to opt-out of receiving unsolicited sales calls. If you would like to register with the TPS, you may do so at https://www.tpsservices.co.uk/tps-services-for-consumers/register-on-the-tps.aspx or by calling 0843 005 9576.

Like TPS, Fax Preference Service ("FPS") is a register where businesses and individuals may opt-out of receiving unsolicited sales and market faxes. You may register with FPS by calling 0843 005 9576 or online at https://secure.dma.org.uk/cgi-bin/session.pl?reg_option=fps.

Internet dialler protection

An Internet dialler, which is similar to a computer virus, is software that can be downloaded onto your computer and can connect your computer to Premium Rate Services without your knowledge or consent. To protect your computer, we recommend that you exercise caution when clicking on links or popups and downloading material for unknown sources. For further protection, upon request by phone or e-mail, we can bar access to all or specific Premium Rate Services for content and cost reasons. In addition, we recommend that you download all necessary security software to protect your computer and that you frequently install updates for such software as it becomes available. If you believe you have been victimized by an Internet dialler, please contact us by phone or e-mail.

PhonepayPlus

All Service Providers must register with PhonepayPlus, which is an independent organization approved by Ofcom. PhonepayPlus regulates Premium Rate Services and investigates complaints filed by consumers. All Service Providers must adhere to the PhonepayPlus Code of Practice, which can be found at http://www.phonepayplus.org.uk/for-business/code-of-practice. If a Service Provider violates the Code of Practice, PhonepayPlus may:

- Require a party to remedy a breach
- Issue fines
- Bar access to services

Service provider contact information

To find contact information for a Service Provider, you can use PhonepayPlus' #NumberChecker tool at http://www.phonepayplus.org.uk/for-consumers/making-an-enquiry/submit-an-online-enquiry. If you believe that you were wrongfully charged for a Premium Rate Service, you should contact the Service Provider directly.

Complaints

If you wish to file a complaint about a Service Provider with PhonepayPlus, you may, free of charge, submit an enquiry either online or by phone:

- Phone: 0300 30 300 20 (9:30 am - 5 pm Monday to Friday)
- Online Enquiry: http://www.phonepayplus.org.uk/for-consumers/making-an-enquiry/submit-an-online-enquiry

Dispute resolution

If you believe that the charge on your Premium Rate Service charge on you bill was an error on Skype for Business' part and you would like a refund, you can file a complaint according to the Skype for Business Complaint Handling Code. If you file a complaint with Skype for Business and either (a) the complaint is not resolved after eight (8) weeks of submission or (b) you receive a letter from us stating that we have reached a final decision, you may refer the complaint to Ombudsman Services, which is a third party approved by Ofcom to deal with complaints regarding communications services.

13. National translation services, personal numbers and 0870 numbers

National Translation Services are telephone numbers that begin with 08 or 0500 (Freephone numbers) and are classified as "special service numbers" by the National Telephone Numbering Plan. Personal Numbers are prefixed with the numbers 070.

Rates for National Translation Services, Personal Numbers, and 0870 numbers are provided on our website and may fluctuate depending on the time of day and the day of the week that your call is made. Calls to 0800 numbers are free.

Related topics

Country and region availability for Audio Conferencing and Calling Plans

Calling plans in Microsoft 365 - Complaint handling code for the United Kingdom (U.K.)

4/22/2020 • 2 minutes to read • Edit Online

This Code applies to small business customers (organizations with 10 employees or less) in the United Kingdom (UK) with respect to the Microsoft 365 Calling Plan service (the "Service") in accordance with UK communications regulations. Other Skype for Business services are governed by your service agreement with Microsoft and any other terms applicable to your use of the particular service.

How to make a complaint

Customer satisfaction is a priority for Skype for Business. However, in the event that you are dissatisfied with the Service for any reason, you may file a complaint by phone or online:

- Toll-Free Phone Number: 0800 032 6417
- Online: Sign in to the Microsoft 365 admin center and submit a service request by selecting **New service request** under **Support**.

Timelines

If you file a complaint by phone during normal business hours, you will speak to a live Skype for Business representative, who will attempt to resolve the issue during the phone call.

If you file a complaint online, a Skype for Business representative will respond to your complaint within two (2) business days of receiving the complaint and will attempt to resolve the issue immediately.

If a Skype for Business representative is unable to resolve the issue immediately, he or she will clearly explain further steps that need to be taken to investigate the matter. The representative will provide you his or her contact information so that you may contact him or her with any questions throughout the course of the investigation.

Skype for Business aims to resolve all complaints related to the Service within seven (7) business days of receipt.

If you are unhappy with the manner in which your complaint regarding the Service is managed, you may ask the Skype for Business representative handling your complaint, by phone or email, to escalate the complaint to in accordance with your service agreement. Microsoft will evaluate the complaint within seven (7) days of receipt.

Alternative dispute resolution

If your complaint regarding the Service is not resolved after eight (8) weeks of submission or if you receive a letter from us stating that we have reached a final decision, you may refer the complaint to Ombudsman Services, which is a third party approved by Ofcom to deal with complaints regarding communications services. We will also notify you, in writing, about the availability of such alternative dispute resolutions services.

Ombudsman Services is independent of Microsoft and will render an impartial decision on the merits of the complaint. There is no cost for referring a complaint to Ombudsman Services.

All complaints must be sent to Ombudsman Services within twelve (12) months of filing the complaint with Skype for Business.

The steps for referring a complaint to Ombudsman Services can be found on the Ombudsman Services' website.

You may reach Ombudsman Services by filling out a contact form on the Ombudsman Services' website or by

phone, letter, or email:

- Contact Form: https://www.ombudsman-services.org/about-us/contact-us
- Phone: 0330 440 1614

  Fax: 0330 440 1615

  Textphone: 0330 440 1600
- E-mail: osenquiries@os-communications.org

  Letter:

  Ombudsman Services: Communications

  PO Box 730

  Warrington

  WA4 6WU

Related topics

Country and region availability for Audio Conferencing and Calling Plans

Emergency calling terms and conditions

6/10/2020 • 2 minutes to read • Edit Online

IMPORTANT INFORMATION

Emergency Services calling operates differently with Calling Plans in Microsoft 365 or Office 365 than on traditional telephone services. It is important that you understand these differences and communicate them to all users with Calling Plans in Microsoft 365 or Office 365. You acknowledge and agree that you have read and understand the differences in our Emergency Services calling and will provide this notice to each user with Calling Plans in Microsoft 365 or Office 365.

The differences in our Emergency Services calling capabilities include the following: (i) Skype for Business and Teams may not know the actual location of a caller making an Emergency Services call, which could result in the call being routed to the wrong Emergency Services call center and/or emergency services being dispatched to the wrong location; (ii) if the user's Teams client is offline, or if the user's device is unable to access the internet for any reason, such as a network outage or power outage, Emergency Services calls through Phone System in Microsoft 365 or Office 365 are not supported and are not expected to work; and (iii) although Calling Plans in Microsoft 365 or Office 365 can be used anywhere in the world where an internet connection is available, users should not make an Emergency Services call from a location outside their home country/region because the call likely will not be routed to the appropriate call center in that country/region.

Related topics

Transferring phone numbers common questions

Different kinds of phone numbers used for Calling Plans

Manage phone numbers for your organization

Emergency Calling disclaimer label

Discovery questionnaire - Evaluate your environment

11/2/2020 • 11 minutes to read • Edit Online

The following set of tables list questions that will help you evaluate your environment before upgrading to Teams:

- Microsoft 365 or Office 365 organization details
- Existing collaboration platform summary
- Collaboration platform deployment details
- Networking and access to Microsoft 365 or Office 365 services
- Endpoints
- Operations
- Adoption and readiness

Microsoft 365 or Office 365 organization details

We highly recommend that you have an active Microsoft 365 or Office 365 organization as you work with the questionnaire. If you haven't activated or configured a Microsoft 365 or Office 365 organization yet, see Plan your setup of Microsoft 365 for business.

Use the following table to capture information about the Microsoft 365 or Office 365 organization.

QUESTION	ANSWER	COMMENTS
Note the production Microsoft 365 or Office 365 organization name and ID in the Answer column If you have more than one tenant associated with your organization, note all the IDs.	Tenant Name: Tenant ID:	
In what regions are the tenants deployed?		
Are these tenants Microsoft 365 or Office 365 Multitenant or Dedicated?	☐ Multitenant ☐ Dedicated	
Which Microsoft Online products are in use today? Note the number of users enabled for each service in the Comments column.	☐ Microsoft Teams ☐ Skype for Business Online ☐ Exchange Online ☐ SharePoint Online ☐ OneDrive for Business ☐ Yammer ☐ Other	
What license level is enabled for Skype for Business Online users?	☐ E1/G1 ☐ E2/G2 ☐ E3/G3 ☐ E4/G4 E5 ☐ Standalone	The number of users for each SKU:

QUESTION	ANSWER	COMMENTS
What is the current Active Directory forest functional level in the environment? If there's more than one forest, note the details in the Comments column.	☐ Windows Server 2000 ☐ Windows Server 2003 ☐ Windows Server 2008 ☐ Windows Server 2008 R2 ☐ Windows Server 2012 ☐ Windows Server 2012 R2 ☐ Windows Server 2016	
What are you using for directory synchronization today?	☐ No sync (cloud only) ☐ Azure Active Directory Connect ☐ Other (Specify in the Comments column.)	
Is federated identity currently deployed? (Active Directory Federation Services or third-party)	☐ Yes ☐ No	
If you're using federated identity, what is the federation infrastructure?	☐ Windows 2008 R2 AD FS ☐ Windows 2012 AD FS ☐ Windows 2012 R2 AD FS ☐ Windows 2016 AD FS ☐ Third-party federation gateway (Note the details in the Comments column.)	
If you currently maintain an active Microsoft 365 or Office 365 tenant, is the SMTP/SIP domain of your targeted users associated with the tenant?	☐ N/A – No Microsoft 365 or Office 365 tenant in place ☐ No, users' SMTP/SIP domain isn't associated with any tenants in Microsoft 365 or Office 365 ☐ Yes, users' SMTP/SIP domain is associated with an existing tenant in Microsoft 365 or Office 365	
Do user UPNs match their primary SMTP address?	☐ Yes ☐ No ☐ Inconsistently	

Existing collaboration platform summary

Use the following table to capture information about your existing collaboration platform deployment.

QUESTION	ANSWER	COMMENTS
Is Microsoft Teams deployed?	☐ Yes ☐ No	

QUESTION	ANSWER	COMMENTS
Is Skype for Business deployed? For on-premises and hybrid deployments, make sure you note the version and cumulative update (CU) details in the Comments column.	☐ Yes, Microsoft 365 or Office 365 ☐ Yes, hybrid (with Microsoft 365 or Office 365) ☐ Yes, on-premises ☐ Yes, online, dedicated (Microsoft) ☐ Yes, hosted, dedicated (third party) ☐ Yes, hosted, shared (third party) ☐ No, other	
Is Exchange deployed? For on-premises and hybrid deployments, make sure you note the version and CU details in the Comments column.	☐ Yes, Microsoft 365 or Office 365 ☐ Yes, hybrid (with Microsoft 365 or Office 365) ☐ Yes, on-premises ☐ Yes, online, dedicated (Microsoft) ☐ Yes, hosted, dedicated (third party) ☐ Yes, hosted, shared (third party) ☐ No, other	
Is SharePoint deployed? For on-premises and hybrid deployments, make sure you note the version and CU details in the Comments column.	☐ Yes, Microsoft 365 or Office 365 ☐ Yes, hybrid (with Microsoft 365 or Office 365) ☐ Yes, on-premises ☐ Yes, online, dedicated (Microsoft) ☐ Yes, hosted, dedicated (third party) ☐ Yes, hosted, shared (third party) ☐ No, other	
Is Microsoft 365 or Office 365 OneDrive for Business deployed?	☐ Yes ☐ No	
Do you have any other third-party platforms deployed and in use today? If so, note the number of users of these platforms and the usage details in the Comments column.	☐ Cisco WebEx ☐ Slack ☐ Other (Specify in the Comments column.)	Number of users: Details:
Are you planning to move users from these third-party platforms to Teams?	☐ Yes ☐ No	
What is the current telephony and conferencing solution of the users who are in scope for this initiative?		

QUESTION	ANSWER	COMMENTS
Do you have SBCs that support Direct Routing deployed for your offices that are in scope for this initiative? If Yes, note the details in the Comments column.	☐ Yes ☐ No	

Collaboration platform deployment details

Microsoft Teams (if applicable)

If applicable, capture the details of your Teams deployment by using the sample table below. If you haven't deployed Teams, skip this section.

QUESTION	ANSWER	COMMENTS
What types of users are enabled for Teams?	☐ All users in the organization ☐ Specific users/user groups (Specify in the Comments column)	
Which Teams features and modalities are in use?	☐ Channel-based conversations ☐ Private chat ☐ Guest access ☐ Channel meetings ☐ Private meetings ☐ Private calling ☐ Ad-hoc channel meetup ☐ Videos in meetings ☐ Screen sharing in meetings ☐ Audio conferencing ☐ Applications (apps) ☐ Tabs ☐ Bots ☐ Connectors ☐ Custom cloud storage integration Dropbox, Box, ShareFile, Google Drive, Egnyte ☐ Channel email integration ☐ Other (Specify in the Comments column.)	
What applications have you deployed to Teams?		
Have you specifically blocked any Teams capabilities? If Yes, note the details in the Comments column.	☐ Yes ☐ No	
Which Teams clients are in use?	☐ Web ☐ Windows ☐ Mac ☐ iOS ☐ Android ☐ Windows Mobile	

QUESTION	ANSWER	COMMENTS
Who has permissions to create teams?	☐ Everyone in the organization (This is the default setting) ☐ Specific people (Specify in the Comments column.)	
Are you using security and compliance features in Teams?	☐ Yes ☐ No	

Skype for Business Online (if applicable)

If applicable, capture the details of your Skype for Business Online deployment by using the sample table below. If you haven't deployed Skype for Business Online deployment, skip this section.

QUESTION	ANSWER	COMMENTS
What types of users are enabled for Skype for Business Online?	☐ All users in the organization ☐ Specific users/user groups (Specify in the Comments column)	
What modalities and features are currently in use today?	☐ Instant Messaging and Presence (IM/P) ☐ Meetings ☐ Federation ☐ Meeting Recording ☐ Microsoft Audio Conferencing ☐ Third-party audio conferencing (Note the details in the Comments column.) ☐ Calling Plans (formerly PSTN calling) ☐ Organizational Auto Attendants ☐ Call Queues	
Have you specifically blocked any Skype for Business Online capabilities? If Yes, note the details in the Comments column.	☐ Yes ☐ No	
What method are you using or plan to use to connect Phone System (formerly Cloud PBX) to the PSTN? Select all that apply.	☐ Calling Plans (formerly PSTN calling) ☐ On-premises PSTN connectivity (leveraging existing Skype for Business 2015 or Lync Server 2013 deployment) ☐ On-premises PSTN connectivity (using Cloud Connector)	
Have you ported any phone numbers to Microsoft? This is applicable to Calling Plans and Audio Conferencing features.	☐ Yes ☐ No	

Skype for Business on-premises (if applicable)

If applicable, capture the details of your Skype for Business deployment by using the sample table below. If you haven't deployed Skype for Business on-premises, skip this section.

QUESTION	ANSWER	COMMENTS
What versions of Lync or Skype for Business currently are deployed on-premises?	☐ Office Communications Server 2007 "R1" ☐ Office Communications Server 2007 R2 ☐ Lync Server 2010 ☐ Lync Server 2013 ☐ Skype for Business Server 2015 ☐ Skype for Business Server 2019 ☐ Skype for Business Cloud Connector Edition	
Is hybrid with Skype for Business Online configured?	☐ Yes ☐ No	
Is this environment hosted and managed by a third party? If Yes, note the details in the Comments column.	☐ Yes ☐ No	
What modalities and features are currently in use today?	☐ Instant Messaging and Presence (IM/P) ☐ Meetings ☐ Federation ☐ Meeting Recording ☐ Persistent Chat / Group Chat ☐ Microsoft Audio Conferencing (formerly Dial in Conferencing) on your on-premises Lync Server or Skype for Business deployment ☐ Third-party audio conferencing (Note the details in the Comments column) ☐ Enterprise Voice using on-premises PSTN connectivity ☐ Calling Plans (formerly PSTN calling) via Hybrid with Skype for Business Online	
Which version(s) of Edge Server do you have deployed?	☐ Office Communications Server 2007 "R1" ☐ Office Communications Server 2007 R2 ☐ Lync Server 2010 ☐ Lync Server 2013 ☐ Skype for Business Server 2015 ☐ Skype for Business Server 2019	
Do you have Lync or Skype for Business Edge deployed into more than one datacenter? If Yes, note the details in the Comments column.	☐ Yes ☐ No	

QUESTION	ANSWER	COMMENTS
Select services that your Edge role provides today.	☐ External user access (corporate users) ☐ Remote user access (anonymous external meeting participants) ☐ Federation ☐ Media relay	
Which of the following voice calling features do you currently have dependencies on? Note any additional dependencies in the Comments column.	☐ Busy options ☐ Call park ☐ Call pickup or group call pickup ☐ Common area phones, or "hot desking" ☐ Response groups or hunt groups ☐ Shared line appearance ☐ Private line ☐ Voicemail ☐ Call via work ☐ Emergency or information numbers (911, 811, 411) ☐ Extension dialing ☐ Auto Attendant ☐ Subscriber access ☐ Analog devices ☐ Fax ☐ Caller ID masking or altering ☐ Location-based routing ☐ Least-cost routing ☐ Elevator phones	

Networking and access to Microsoft 365 or Office 365 services

Use the following table to capture your organization's networking details and how your users are (or will be) connected to Microsoft 365 or Office 365 services.

QUESTION	ANSWER	COMMENTS
How do (or how will) the users in scope for migration access Teams when they're in the office? Select all that apply.	☐ Routed NAT connection ☐ Proxy server ☐ Public Wi-Fi ☐ Managed (not public) Wi-Fi ☐ ExpressRoute (Microsoft peering)	
If access to Microsoft 365 or Office 365 is through a proxy server, is there any way to bypass the proxy?	☐ Yes ☐ No	
Is ExpressRoute being used today?	☐ Yes ☐ No ☐ No, but it's being planned	
Have you performed a Network Readiness Assessment?	☐ Yes ☐ No	

QUESTION	ANSWER	COMMENTS
Are users required to use a VPN when connecting to corporate resources remotely?	☐ Yes ☐ No	
If a VPN is used, can Teams traffic be excluded from the VPN to access Microsoft 365 or Office 365 Services directly?	☐ Yes ☐ No	
Does your network support QoS?	☐ Yes ☐ No	
Can you prioritize Teams audio and video traffic to drive a high-quality experience?	☐ Yes ☐ No	
Do all locations within a region have internet egress, or is internet egress centralized for the entire region?	☐ Regional access to the internet ☐ Centralized access to the internet	

Endpoints

Use the following table to capture the details of the clients and endpoints in use.

QUESTION	ANSWER	COMMENTS
What desktop OS are the users using?	☐ Windows XP ☐ Windows 7 ☐ Windows 8 ☐ Windows 10 ☐ Mac (Specify the version in the Comments column.) ☐ Linux (Specify the distribution in the Comments column.) ☐ Other (Note the details in the Comments column.)	
What version of Microsoft Office is deployed to these devices?	☐ Office 2003 ☐ Office 2007 ☐ Office 2010 ☐ Office 2013 ☐ Office 2016 ☐ Office for Mac 2011 ☐ Office for Mac 2016 ☐ Other (Note the details in the Comments column.)	
Which Office deployment technology is in use in your organization?	☐ MSI ☐ Click-to-Run	

QUESTION	ANSWER	COMMENTS
What are the allowed and supported mobile platforms in use? Select all that apply.	☐ Windows ☐ Mobile ☐ iOS ☐ Android ☐ Other (Note the details in the Comments column.)	
How are mobile devices provided? Select all that apply.	☐ Corporate devices ☐ Bring your own device	
What devices do users currently use to access voice and conferencing services (handsets, headsets, phones, video)?		

Operations

Use the following table to capture the details of the operational aspects of your environment.

QUESTION	ANSWER	COMMENTS
What is your operations model for your Lync Server, Skype for Business Server, Microsoft 365, or Office 365 deployment today?		
Can you outline the current support arrangement for Lync Server, Skype for Business Server, Microsoft 365, or Office 365?		
If you're deploying to multiple countries or regions, does each country/region have its own IT/telephony staff to work with, or will this be managed centrally?	☐ Regional operations and support ☐ Centralized operations and support	
Are you following the Call Quality Methodology?	☐ Yes ☐ No	
Have you assigned an individual or team to the Quality Champion role for the collaboration platform in use?	☐ Yes ☐ No	
How do you monitor your Lync Server, Skype for Business Server, Microsoft 365, or Office 365 deployment?		
Do you experience call quality issues?	☐ Yes ☐ No	

QUESTION	ANSWER	COMMENTS
How and when do you provide training to your helpdesk on new services and capabilities?		

Adoption and readiness

Use the following table and capture the current adoption and readiness state of your organization.

QUESTION	ANSWER	COMMENTS
What is your current active usage of Skype for Business?	__ % total active users versus enabled users	
How is your organization using Skype for Business?	1:1 conversations ☐ IM ☐ Calling ☐ Sharing Meetings ☐ Conferencing ☐ Sharing ☐ Calling	
Does your organization have a User Adoption and Change Management team?	☐ Yes ☐ No	
How do you currently measure success for technology rollouts like Skype for Business?		
What percentage of your user base would you say has adopted Skype for Business?		
What is user sentiment around Skype for Business?	☐ Good ☐ Neutral ☐ Bad	
Which of the following best describes the rollout strategy used for your Skype for Business deployment?	☐ Broad reach: Email campaign with links to training ☐ Expanded: Broad reach plus a variety of awareness campaigns (posters, events, champions) and training (videos, user guides, in-person) ☐ Tailored: Expanded, plus targeted messaging and training by persona ☐ Other (Note the details in the Comments column.)	

Export content with the Microsoft Teams Export APIs

11/2/2020 • 3 minutes to read • Edit Online

Teams Export APIs allow you to export 1:1 and group chat messages from Microsoft Teams. If your organization needs to export Microsoft Teams messages, you are able to extract them using Teams Export APIs. *Chat Message* represents an individual chat message within a channel or chat. The chat message can be a root chat message or part of a reply thread that is defined by the **replyToId** property in the chat message.

Here are some examples on how you can use these export APIs:

- **Example 1**: If you have enabled Microsoft Teams in your organization and want to export all the Microsoft Teams messages to date programmatically by passing the date range for a given user.
- **Example 2**: If you want to programmatically export all user messages daily by providing a date range. Export APIs can retrieve all the messages created or updated during the given date range.

What is supported by the Teams Export APIs?

- **Bulk Export of Teams Message:** Teams Export APIs support up to 200 RPS Per App Per tenant and 600 RPS for an Application, with these limits you should be able to bulk export of Teams messages.
- **Application Context**: To call Microsoft Graph, your app must acquire an access token from the Microsoft identity platform. The access token contains information about your app and the permissions it has for the resources and APIs available through Microsoft Graph. To get an access token, your app must be registered with the Microsoft identity platform and be authorized by either a user or an administrator for access to the Microsoft Graph resources it needs.

  If you are already familiar with integrating an app with the Microsoft identity platform to get tokens, see the Next Steps section for information and samples specific to Microsoft Graph.
- **Hybrid Environment:** Export APIs support messages sent by users who are provisioned on Hybrid Environment (on-premises Exchange and Teams). Any messages that are sent by users who are configured for hybrid environment will be accessible using Export APIs.
- **User Deleted Messages:** Messages that are deleted by user from Teams client can be accessed using export APIs up to 30 days from the time of deletion.
- **Message Attachments:** Export APIs include the links to the attachments that are sent as part of messages. Using Export APIs you can retrieve the files attached in the messages.
- **Chat Message Properties:** Refer to the complete list of properties that Teams Export APIs support here.

How to access Teams Export APIs

- **Example 1** is a simple query to retrieve all the messages of a user without any filters:

  ```
  GET https://graph.microsoft.com/beta/users/{id}/chats/allMessages
  ```

- **Example 2** is a sample query to retrieve all the messages of a user by specifying date time filters and top 50 messages:

```
GET https://graph.microsoft.com/beta/users/{id}/chats/allMessages?$top=50&$filter=lastModifiedDateTime
gt 2020-06-04T18:03:11.591Z and lastModifiedDateTime lt 2020-06-05T21:00:09.413Z
```

NOTE

The API returns response with next page link in case of multiple results. For getting next set of results, simply call GET on the url from @odata.nextlink. If @odata.nextlink is not present or null then all messages are retrieved.

Prerequisites to access Teams Export APIs

- Teams Export APIs are currently in preview. It will only be available to users and tenants that have the required licenses for APIs. In the future, Microsoft may require you or your customers to pay additional fees based on the amount of data accessed through the API.
- Microsoft Teams APIs in Microsoft Graph that access sensitive data are considered protected APIs. Export APIs require that you have additional validation, beyond permissions and consent, before you can use them. To request access to these protected APIs, complete the request form.
- Application permissionsare used by apps that run without a signed-in user present; application permissions can only beconsented by an administrator. The following permissions are needed:
  - *Chat.Read.All*: enables access to all 1:1 and Group chat messages
  - *User.Read.All*: enables access to the list of users for a tenant

JSON representation

The following example is a JSON representation of the resource:

Namespace: microsoft.graph

```
{
"id": "string (identifier)",
"replyToId": "string (identifier)",
"from": {"@odata.type": "microsoft.graph.identitySet"},
"etag": "string",
"messageType": "string",
"createdDateTime": "string (timestamp)",
"lastModifiedDateTime": "string (timestamp)",
"deletedDateTime": "string (timestamp)",
"subject": "string",
"from": {
                "application": null,
                "device": null,
                "conversation": null,
                "user": {
                    "id": "0de69e5e-2da8-4cf2-821f-5e6585b2c65b",
                    "displayName": "User Name",
                    "userIdentityType": "aadUser"                }
            },
"body": {"@odata.type": "microsoft.graph.itemBody"},
"summary": "string",
"chatId": "19:0de69e5e-2da8-4cf2-821f-5e6585b2c65b_5c64e248-3269-4268-a36e-0f80314e9c39@unq.gbl.spaces"
"attachments": \[{"@odata.type": "microsoft.graph.chatMessageAttachment"}\],
"mentions": \[{"@odata.type": "microsoft.graph.chatMessageMention"}\],
"importance": "string",
"locale": "string",
}
```

NOTE

For more details on chatMessage resource, see the chatMessage resource type article.

Release notes for Microsoft Teams admin features

12/5/2020 • 14 minutes to read • Edit Online

These release notes provide information about new admin features for Microsoft Teams.

November 25, 2020

Set up Microsoft Teams meeting add-on for Google Workspace

Using the Microsoft Teams meeting add-on lets Google calendar users schedule and join a Microsoft Teams meeting directly from Google Workspace. Users will get access to Teams meetings features including video and audio conferencing, screen sharing, meeting chat, digital whiteboards, and more. Stay connected and organized to get more done together across work, school, and life.

The Microsoft Teams meeting add-on for Google Workspace must be enabled by a Teams admin before tenant users can access the app. Learn more.

October 28, 2020

Get started with Teams in healthcare

Microsoft Teams offers a number of features useful for hospitals and other healthcare organizations, including:

- Virtual visits and Electronic Healthcare Record (EHR) integration
- Teams policy packages
- Secure messaging
- Teams templates
- Care coordination and collaboration

This functionality is part of the Microsoft Cloud for Healthcare. Learn more.

October 27, 2020

Teams displays

Microsoft Teams displays are a category of all-in-one dedicated Teams devices that feature an ambient touchscreen and a hands-free experience powered by Cortana. Learn more.

October 22, 2020

Manage Skype for Business settings for your users

You can manage Skype for Business settings for Skype for Business users in your organization in the Microsoft Teams admin center. Go to the Skype for Business tab on the user details page. From here, you can manage external access and meeting settings for individual users. Learn more.

Manage Skype for Business settings for your organization

You can manage Skype for Business features for Skype for Business users in your organization in the Microsoft Teams admin center. Go to **Org-wide settings** > **Skype for Business**. From here, you can manage Skype Meeting Broadcast, presence, and mobile notifications. Learn more.

October 16, 2020

Manage shift-based access for Firstline Workers

As an admin, you can configure Teams to show a set of shift-based presence states for the Firstline Workers in your organization to indicate when they are on and off shift. With shift-based access, you can manage access to Teams when Firstline Workers are off shift. For example, you can set Teams to display a message that Firstline Workers must acknowledge before they can use Teams when they're not on a scheduled shift. Learn more.

October 15, 2020

Custom policy packages

This feature is in private preview

Custom policy packages let you bundle your own set of policies for users with similar roles in you organization. Create your own policy packages by adding the policy types and policies that you need. Learn more.

Add an app to a team in the Microsoft Teams admin center

On the Manage apps page of the Microsoft Teams admin center, you can use the **Add to team** button to install an app to a team. Learn more.

October 1, 2020

Use OneDrive for Business and SharePoint for meeting recordings

Microsoft Teams has a new method for saving meeting recordings. As the first phase of a transition from classic Microsoft Stream to the new Stream, this method stores recordings on Microsoft OneDrive for Business and SharePoint in Microsoft 365 and offers many benefits. Learn more.

Free audio conferencing for small to medium businesses

If you're a small or medium-sized business with up to 300 users and you currently don't have any Audio Conferencing licenses, you can get Audio Conferencing free for one year. This free offer is available starting October 1, 2020. Learn more.

View app permissions and grant admin consent in the Microsoft Teams admin center

Now in Teams admin center global admins will be able to review and grant consent to Graph API permissions registered in Azure Active Directory, on behalf of the entire tenant for the permissions an app is requesting such as reading information stored in a team or sending an email on behalf of users. Now IT admins will be able to review resource-specific consent (RSC) permissions for the apps within Teams admin center. With that admins will be able to unblock their users for the third-party apps they have already reviewed and approved to use in their organization. Learn more.

Calling Plans support for Austria, Denmark, Italy, Portugal, Sweden, and Switzerland

We've recently added calling plan support for Austria, Denmark, Italy, Portugal, Sweden, and Switzerland. Learn more.

September 29, 2020

Meeting policy settings

Adding two policy settings for IP audio and IP video in Teams meetings policies: Mode for IP audio and Mode for IP video. You can now set incoming and outgoing IP audio and IP video in Teams meeting policies. Learn more.

September 27, 2020

Simplified notification setting

Users can now manage their notifications settings in a more simplified manner with enhanced functionalities.

September 24, 2020

Teams integration with Android contacts

Call using Teams directly through your Android Phonebook.

September 21, 2020

Manage Microsoft Power Platform apps in the Microsoft Teams admin center

As an admin, you can control whether users can see and install Microsoft Power Platform apps in Built by your colleagues on the Apps page in Teams. You can collectively block or allow all apps created in Power Apps or all apps created in Power Virtual Agents at the org level on the Manage apps page or for specific users using app permission policies. Learn more.

September 19, 2020

Sharing files in Microsoft Teams

In Microsoft Teams, users can share content with other Teams users within and outside their organization. Sharing in Teams is based on the settings configured in SharePoint and OneDrive, so whatever you set up for SharePoint and OneDrive will control sharing in Teams as well. Learn more.

September 16, 2020

New third-party video provider Riverbed

Use Teams live events settings to configure settings for live events that are held in your organization. You can set up a support URL and configure a third-party video distribution provider. These settings apply to all live events that are created in your organization. Riverbed is a new third-party provider. Learn more.

September 15, 2020

Skype for Business Online Connector integrated to Teams PowerShell module

The latest Teams PowerShell public release is integrated with Skype for Business Online Connector, providing a single module for Teams PowerShell management. Learn more.

September 8, 2020

Porting PIN

We added the ability to set up and manage a PIN used for porting or transferring phone numbers. You will provide this PIN to the PSTN service desk when you want to port numbers out to a service provider from Microsoft. Learn more.

September 3, 2020

Custom apps store in Microsoft Teams

Now you can customize the Teams Apps store with your organizational branding by adding your logo, custom backgrounds, and custom text colors to make it more inviting to end users. Learn more.

September 1, 2020

On-demand translation in Android

Inline message translation is a Microsoft Teams feature that lets users translate Teams messages into the language specified by their personal language settings. The translation setting is **On** by default. Learn more.

August 17, 2020

Group chat size increase

We added the ability to now have 250 participants in a group chat. Learn more.

Manage the Praise app

The Praise app in Microsoft Teams helps users show appreciation to members of their organization or classroom. The Praise app has a selection of badge sets to choose from and provides the option to create your own badges. Praise is designed to help recognize the effort that goes into the wide range of work that Teams users do, from educators to Firstline Workers. Learn more.

Set up Coordinated Meetings with Microsoft Teams Rooms and Surface Hub

If you have one or more Microsoft Teams Rooms devices or Surface Hubs in a meeting room, you can set up Coordinated Meetings. Coordinated Meetings lets you set up your Teams Rooms devices and Surface Hubs so that when you join a meeting on one device, the other devices in the room are also joined to the same meeting. Learn more.

Tagging by shift

With this feature, people are automatically assigned tags that match their schedule and shift group name in the Shifts app in Teams. Learn more.

August 14, 2020

Cortana voice skills in Teams

Cortana voice skills in Teams mobile app help users perform meeting, communication, and collaboration tasks simply using spoken natural language. Users can speak to Cortana by clicking on the microphone button in Teams app and make requests like "Call Megan" or "Send a message to my next meeting" if they need to connect with someone while juggling household chores or walking the dog or generally on the go. Users can join meetings simply by saying "Join my next meeting" or check their calendar by asking "what do I have this morning". Once in a meeting or a call, they can invoke Cortana from the overflow menu in the meeting stage and perform typical in-meeting tasks like adding people by name or number ("Add Megan to the call"), deck presentation ("present the quarterly review deck") or navigating slides ("Go to the appendix slide"). Other things that the feature supports are finding and sharing files, search, and navigating within the Teams app ("Open my chat with John, Go to my unread activity, Go to my mentions etc.).

Cortana in Teams meets the same enterprise-level privacy, security, and compliance promises for Cortana enterprise services, as reflected in the Online Services Terms (OST). Learn more.

Teams Devices Administrator

Users with this role can manage Teams certified devices from the Teams admin center. They can check details of each device including the account that is signed in, and the make and model of the device. They can change the settings on the device, update the software, and restart devices remotely. Learn more.

August 12, 2020

Lists app in Teams

Teams users can now directly manage, create, and maintain their lists using the Lists app tab. The Lists app works on all Teams clients and enables collaboration and communication around list items. Learn more.

August 6, 2020

Approve custom apps

Approve custom apps submitted through the Teams App Submission API. Learn more.

August 3, 2020

Purchase services for Teams third-party apps in the Microsoft Teams admin center

Teams apps are free to install and some may require purchasing service subscriptions to experience the app's full functionality and scope. These service subscriptions are called Software as a Service (SaaS) offers, which are available for purchase through AppSource and now through the Microsoft Teams admin center. Learn more.

Publish a custom app submitted through the Teams App Submission API

Developers can use the Teams App Submission API to submit custom apps directly to the Microsoft Teams admin center for admins to review and approve. Learn more.

July 29, 2020

Enhanced Manageability using Device Tagging functionality

As part of enhanced manageability, we are releasing Device Tagging functionality. It will enable IT admins to group-specific set of devices with user-generated Tags and perform actions on the same. Learn more.

View-only in meetings

View-only allows for up to 20,000 listen-only participants to join a meeting in which the organizer has a license for the Advanced Communications add-on SKU.1 This is a preview or early release feature. Learn more.

July 28, 2020

Create your own Teams template

You can now use templates from the Admin console to create your own Teams template or create a Teams template from existing templates. Learn more.

July 20, 2020

Admins can control outgoing webhooks at the user level

Admins can control outgoing webhooks at the user level by allowing or blocking the Outgoing Webhooks app in app permission policies. Learn more.

July 17, 2020

NDI-out for Teams meetings

We added the ability to enable NDI-Out to a Teams meeting. NDI-Out allows for the audio and video of a meeting to be utilized by video production tools. Learn more.

July 15, 2020

Enable suggested replies

Turn this setting on to enable suggested replies for chat messages. Learn more.

July 9, 2020

Voicemail support in call queues

We added support for call queues to use a shared voicemail box. Learn more.

July 8, 2020

Policy packaging batch assignment

We made it possible to use PowerShell to batch assign a Policy Package for user and groups. Learn more.

July 7, 2020

Sensitivity labels for Teams

Sensitivity labels allow Teams admins to regulate access to sensitive organizational content created during collaboration within teams. Learn more.

July 2, 2020

Suggested replies

We added the ability for Teams users to have a suggested reply to their conversations. These suggestions will appear at the bottom of a chat message if they are enabled. They make replying to messages quick and easy! Learn more.

Transferring incoming calls

We added the ability for auto attendants and call queue incoming calls to be transferred to an external PSTN phone number. Learn more.

June 30, 2020

Install apps on behalf of others

You choose which apps are installed by default for users when they start Teams. Learn more.

Screen sharing on behalf of others

Many IT Admins have complained that they can't have their employees screen share from chat when they disable the AllowPrivateCalling policy. This feature work has decoupled the ability to start a screens hare from chat from the AllowPrivateCalling policy, but it still blocks users from adding audio/video to the screen share session if their AllowPrivateCalling policy is disabled.

June 29, 2020

Walkie Talkie app in Microsoft Teams

Instant voice communication using push-to-talk. Learn more.

June 25, 2020

Teams filter option

We added a new filter option in the command bar so you can set specific parameters when searching for specific teams.

Users widgets

We added a new User summary widget that's available when you're adding teams and channels.

June 21, 2020

Sign in restrictions for Android and iOS users

If user isn't signed in to their Microsoft 365 account anywhere else, they'll be asked to provide single-factor or multi-factor authentication (SFA or MFA), depending on what your organization has configured for mobile sign-in policies. Learn more.

June 15, 2020

Monitor shifts with audit logs

You can search the audit log to view Shifts activity in your organization. Learn more.

June 11, 2020

Call queues - Presence-based routing

When turned off, calls will be routed to agents who have opted in to receive calls, regardless of their presence state. When turned on, opted-in agents will receive calls only when their presence state is Available. Learn more.

June 10, 2020

Call queues - Longest-idle routing

When you choose this, incoming calls will be routed to call agents who haven't answered an incoming call for the longest period of time. Learn more.

June 1, 2020

Raise hand in meetings

Users can now raise a virtual hand in a meeting! Other participants will see your raised hand next to your name in the meeting stage and next to your name in the roster. Learn more.

May 15, 2020

Add more people to a chat

We made it possible to now add up to 350 people to a single chat thread.

May 5, 2020

Easily access meeting options from within a Teams meeting in progress

We're making it easier for meeting organizers to quickly and easily change their presenter and lobby settings once a Teams meeting starts by providing an easy to access link directly in the participants pane. This new functionality will be present for both scheduled and "Meet now" meetings.

Download a participant report in a Teams meeting

Meeting organizers, especially teachers, often need to know who joined their Teams meetings. Soon you will be able to download a participant report, found in the roster view that includes join and leave times for participants. Available in the roster view, meeting organizers can download the report that includes those users who joined while the organizer was present. This feature is only available within the meeting while the meeting is active. Available on desktop (Windows and Mac) and the web. Learn more.

April 26, 2020

Include system audio in live events

Presenters and producers in live events can now include system audio when sharing a desktop or window screen during the live event. This will allow your users to hear any audio part of the content you are sharing.

April 24, 2020

Team and channel analytics

In addition to team analytics, now you can also view channel level metrics and insights. We've also enhanced the time period to 90 days so you can analyze data for longer periods. Apart from that, this release also includes new

metrics and charts around the count of posts, replies, and meetings for a team or channel. Learn more.

April 20, 2020

Enable organizers to change lobby settings for dial-in participants

This setting controls whether people who dial in by phone join the meeting directly or wait in the lobby regardless of the **Automatically admit people** setting.

April 8, 2020

Customize meeting video backgrounds

When you are meeting with video, you now have the choice of different static background images to use. This will let you show this image and not the actual background of where you are sitting. Learn more.

April 1, 2020

Teams for RealWear

Microsoft Teams client for RealWear enables Firstline Workers using RealWear's ruggedized head-mounted wearables to operate Teams 100 percent hands-free and seek remote assistance from experts using Teams video calling. Learn more.

March 31, 2020

Tag, you're it

Create tags and assign people to them so you can @mention a group, role, department, etc. Team owners, try it out for yourselves. Go to a team, select **More options** > **Manage tags**. Learn more.

March 30, 2020

Policy-based recording for Teams calls and meetings

This feature enables automatic policy-based recordings of Teams calls and meetings via Microsoft-certified software vendors.

March 25, 2020

Manage your Collaboration Bar devices in Microsoft Teams

As an admin, you want to manage all your Collaboration Bar devices from Microsoft Teams admin center. You can view inventory of devices, take specific actions on the devices and give commands remotely to all the devices.

Microsoft Teams Public Preview

12/5/2020 • 2 minutes to read • Edit Online

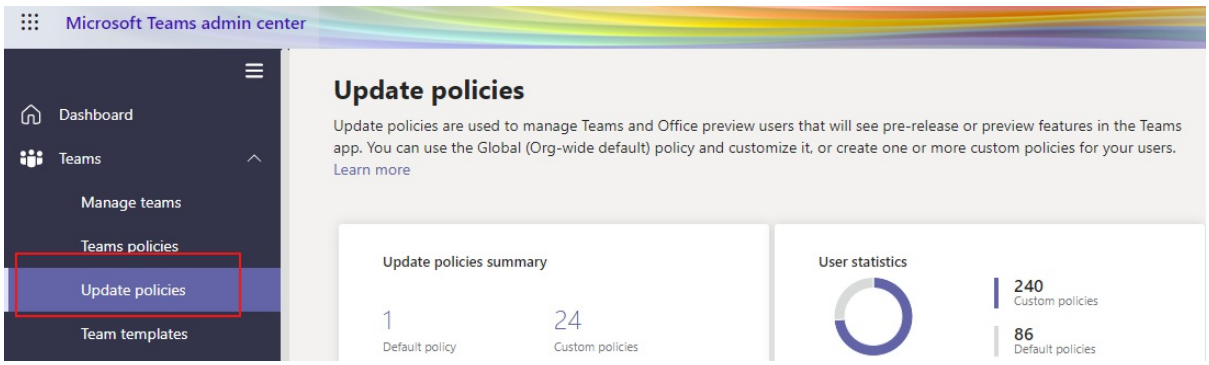
> **NOTE**
> Features included in preview might not be complete, and might undergo changes before becoming available in the public release. They're provided for evaluation and exploration purposes only.

Public Preview for Microsoft Teams provides early access to unreleased features in Teams. Previews allow you to explore and test upcoming features. We also welcome feedback on any feature in public previews. Public preview is enabled each Teams user, so you don't need to worry about affecting your entire organization.

Set the Update policy

Public preview is enabled for each user, and the option to turn on public preview is controlled in an admin policy. Update policies are used to manage Teams and Office preview users who will see pre-release or preview features in the Teams app. You can use the Global (Org-wide default) policy and customize it, or create one or more custom policies for your users. The policy needs to be assigned to specific users because it doesn't over-write the global policy.

1. Sign in to the admin center.
2. Select **Teams** > **Update policies**.



3. Select **Add**.
4. Name the update policy, add a description, and turn on **Show preview features**.

You can also set the policy using PowerShell using the `CsTeamsUpdateManagementPolicy` cmdlet.

Enable public preview

To enable the public preview on a desktop or web client, you need to do the following tasks:

1. Select your profile to display the Teams menu.
2. Select **About → Public preview**.
3. Select **Switch to Public preview**.

Related topics

Public developer preview