CHAPTER 7

Microsoft Teams Troubleshooting Approaches

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In this chapter, we delve into the various aspects of troubleshooting Microsoft Teams, covering everything from call quality issues to difficulties with meetings and user sign-ins. We also tackle policy-related challenges, tenant and network configurations, and other scenarios that administrators may encounter. It’s important to note that Microsoft Teams operates exclusively in the cloud, meaning the scope of troubleshooting for administrators is somewhat restricted compared to legacy systems like Office Communication, Lync, or Skype for Business. Here, the emphasis is largely on client-side troubleshooting using Microsoft-provided data. The chapter zeroes in on three key areas: resolving user login problems, enhancing call quality for individual and group calls, and addressing issues related to Public Switched Telephone Network (PSTN) calls. Additionally, the chapter will introduce various tools that can aid administrators in troubleshooting efforts.

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Basic Troubleshooting Approach Specific to Microsoft Teams

Troubleshooting Microsoft Teams is an essential activity for ensuring seamless communication and collaboration within your organization. Despite its robust features, Microsoft Teams can encounter problems. The following is a comprehensive troubleshooting workflow designed to guide you through resolving common issues step-by-step:

1. **Identify the issue:** Begin by collecting detailed information from the affected user about the problem they're experiencing. This step helps define the issue's scope and nature, giving you a better idea of what you're dealing with.

2. **Check for system requirements:** Verify that the user's device—be it a computer or mobile—fulfills the minimum system requirements for Microsoft Teams. Noncompliant hardware or software can be a root cause for performance hiccups.

3. **Verify network connectivity:** Confirm that the user has stable Internet connectivity. Also, review firewall settings and proxy configurations that may be hampering Teams' ability to connect to the internet.

4. **Update Microsoft Teams:** Ensure that the Microsoft Teams application is updated to the latest version. Outdated software can be riddled with bugs that have been fixed in newer releases.

5. **Reboot or reinstall Teams:** Sometimes, the simplest solutions are the most effective. Try restarting the Teams app or even reinstalling it to solve minor glitches.

6. **Check the service status:** Consult Microsoft's service status page to see if there are any ongoing outages or known issues affecting Teams. This can help determine whether the problem is at your end or Microsoft's.

7. **Review error messages:** Take note of any error codes or messages displayed in Teams. These can be valuable leads in identifying the underlying issue.

8. **Test in safe mode:** If the issue persists, run Teams in safe mode to see if third-party add-ins or plugins could be causing interference.

9. **Clear the cache and cookies:** If the application is sluggish or acting erratically, clearing the web app's cache and cookies might bring performance improvements.

10. **Contact Microsoft Support:** When all else fails, it might be time to consult the experts. Reach out to Microsoft Support for more specialized guidance.

11. **Train users:** In some instances, the problem may not be technical but rather user-related. Ensure that your team is well-versed in how to use Teams to its fullest by offering adequate training and resources.

12. **Monitor for recurrence:** After resolving an issue, don't consider it "case closed." Keep an eye on Teams to make sure the problem doesn't recur. Implementing proactive monitoring can go a long way in preventing future disruptions.

Troubleshooting in Microsoft Teams can be complex and varied, depending on the problem at hand. A methodical approach to diagnosis and resolution will increase your chances of effectively addressing issues, thereby minimizing operational disruptions.

Microsoft Teams Foundation Details for Troubleshooting

Microsoft Teams is a feature-rich platform that enables chat, audio and video calls, meetings, content sharing, and application integration. Understanding the foundational aspects of Teams is crucial for effective troubleshooting. Each of these functionalities is reliant on dependent services that interact to form a cohesive user experience.

Interdependent Services and Licenses

The following are the interdependent services and licenses:

- **Voicemail:** For instance, voicemail messages within Teams are dependent on Exchange Online mailboxes. The Teams client connects to these mailboxes, and voicemail playback requires a specific player.
- **PSTN connectivity:** Teams uses next-generation Calling PSTN, and this functionality is enabled through PSTN Connectivity methods and a Phone System license.
- **Licensing:** It's essential to note that a Teams license is required for user provisioning. If the Skype for Business Online Plan 2 license is deactivated, the corresponding user will be de-provisioned in Teams as well.

Directory Services and Attribute Replication

The following are the directory services:

- **Business Voice Directory:** Microsoft maintains a dedicated business voice directory where user attributes are stored. Reverse Number Lookup (RNL) is performed against these attributes.
- **Attribute issues:** If a phone number appears correctly in Skype for Business Online but results in a "404 not found" error during inbound calls in Teams, this suggests that Teams isn't syncing with the Skype for Business Online directory. Understanding where these attributes are stored and how they sync can save valuable troubleshooting time.

Admin Considerations

As an admin, you should ensure that the necessary Teams services, IP addresses, ports and protocols, URLs, and FQDNs are allowed for each feature to function correctly. The process of troubleshooting should involve the use of core tools specific to Microsoft Teams, collecting diagnostic data, and addressing common issues methodically.

Different Teams features rely on various service URLs, making them critical checkpoints during troubleshooting.

- **Authentication:** Teams login is dependent on `Teams.microsoft.com` and `login.microsoft.com`.
- **Chat and presence:** If chat or presence functionalities are not working as expected, ensure the following URLs are accessible:
    - `amer.ng.msg.teams.microsoft.com` (for one-to-one chat)
    - `chatsvcagg.teams.microsoft.com`
    - `presence.teams.microsoft.com`
    - `northcentralus.notifications.teams.microsoft.com`
- **Calling and live events:** These features rely on service URLs like `api.flightproxy.teams.microsoft.com`, `teams.registrar.prod.v2`, and `broadcast.skype.com`.
- **Settings:** Are dependent on the `config.edge.skype.com`, `config.teams.microsoft.com`, and `teams.api.mt.amer.beta` service URLs.
- **Office 365 and Skype for Business:** Service URLs like `bloguc-my.sharepoint.com`, `bloguc.sharepoint.com`, and `outlook.office.com` are essential for voicemail messages.
- **Telemetry:** Data collection and telemetry rely on URLs such as `pipe.skype.com`, `mobile.pipe.aria.microsoft.com`, and `Watson.telemetry.microsoft.com`.

By having a deep understanding of these foundational details, you can troubleshoot more effectively, pinning down the likely sources of any issues that arise.

Microsoft Teams Sign-in Issues

Let’s talk about sign-in issues.

How Teams Authentication Mechanisms Work

Microsoft Teams incorporates modern authentication (MA) protocols by default, enhancing security and streamlining the user sign-in process. Modern authentication lays the groundwork for advanced features such as single sign-on (SSO), which considerably simplifies the user experience in a multiservice ecosystem like Microsoft 365.

The Role of Single Sign-On

Single sign-on plays an integral part in the user authentication process within Microsoft Teams. With SSO, a user has to enter their credentials only once—generally when they first log into their Microsoft 365 or Office 365 account. From that point onward, Teams can recognize that the user has been authenticated through the centralized system, negating the need to repeatedly enter login information. This creates a frictionless sign-in experience while maintaining a high level of security.

Hard-Coded Modern Authentication

Because Microsoft Teams is built with Modern Authentication protocols hard-coded into the application, it has a tight integration with Office 365/Microsoft 365 user accounts. Essentially, the Teams app is configured to automatically recognize and authenticate users based on their linked Office 365/Microsoft 365 credentials.

Troubleshooting Sign-i Issues

If a user encounters issues when trying to log into Teams, the problem usually lies with the associated Office 365/Microsoft 365 account. Common issues might include the following:

- Expired or incorrect passwords
- Inactive or unassigned licenses
- Configuration issues or restrictions in the Microsoft 365 admin center

By understanding how authentication works in Microsoft Teams, both users and administrators can ensure a smoother, more secure communication and collaboration experience.

Teams Sign-in Issues and Corresponding Error Codes

If users receive an error code when logging in to Teams, you, as an admin, must take appropriate action. Table 7-1 shows a list of error codes and the actions that should be taken.

Table 7-1. *Teams Known Issues*

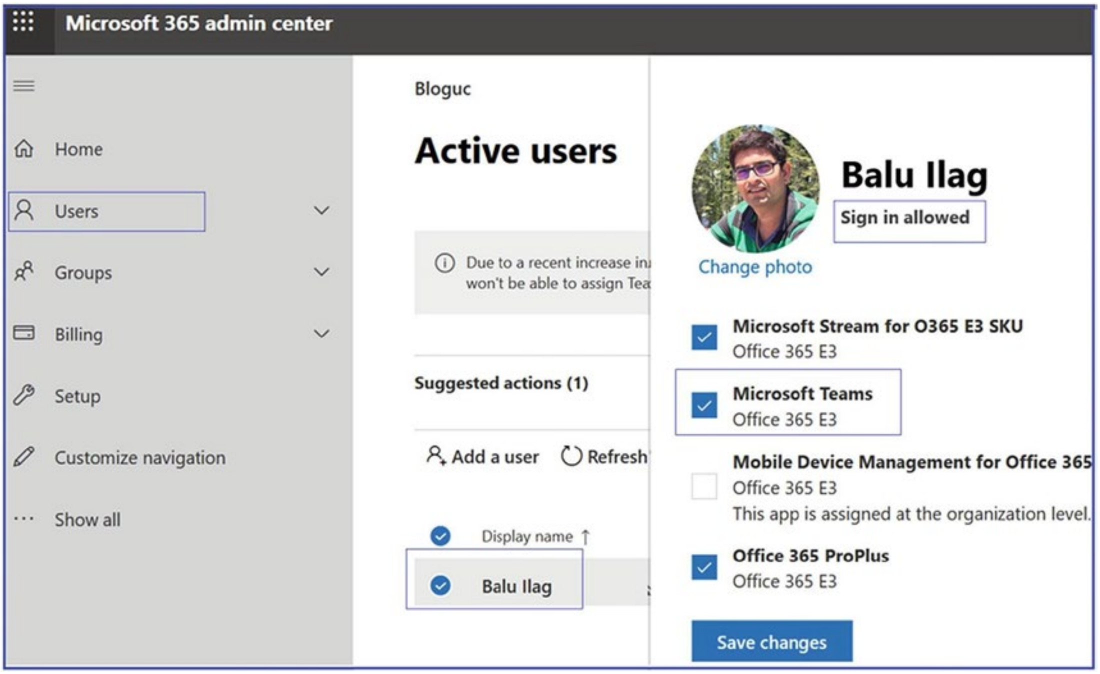
Code	Description	Troubleshooting Action
0xCAA20003	You ran into an authorization problem.	Make sure your date and time are set up correctly. Whether your date and time are accurate will affect your ability to connect to secure sites (HTTPS).
0xCAA82EE2	The request has timed out.	Ensure that you are connected to the Internet. Then work with your IT admin to ensure that other apps or a firewall configuration aren't preventing access.
0xCAA82EE7	The server name could not be resolved.	Ensure that you are connected to the Internet. Then work with your IT admin to ensure that other apps or a firewall configuration aren't preventing access.
0xCAA20004	Your request needs to be approved by a resource owner or authorization server.	Contact your IT admin so they can confirm that your organization is complying with Azure AD configuration policies.
0xCAA90018	You're not using the right credentials.	The Windows credentials you signed in with are different than your Office 365 credentials. Try to sign in again with the correct email and password combination. If you continue to receive this status code, contact your IT admin.
none	You'll need to re-enter your PIN using a smart card.	Reinsert your smart card. Also, your smart card certificate might be corrupt. In that is the case, contact your IT admin.

Microsoft Teams sign-in issues are generally broken into several categories.

- Generally, *authentication issues* happen when users might not be entering their sign-in address (email address) or password correctly, and the Teams back-end service might not authenticate the user. This happens for different reasons.
    - The credentials (email address and password) users entered are incorrect; generally, in Teams, we use User Principal Name (UPN) and password.
    - Teams authentication is also dependent on accurate time information on the user's computer, including the affected user's computer, which is configured to the wrong time zone, or maybe the computer clock is incorrectly set.
- *Teams account provisioning* issues occur if users are not be enabled for Teams, or they are enabled but not authorized to sign in. That can check by checked by logging in to the Office 365 portal. Apart from provisioning, the user account might not be synced correctly to Office 365 (directory synchronization is not happening). To check if an account is enabled for Teams and authorized for sign-in, follow these steps:

    a. Log in to the Office 365 portal (`https://admin.microsoft.com/AdminPortal/Home#/users`) and navigate to Users. Find the affected user and then open the user properties.

    b. Validate that the Teams license is enabled, and check that the user is allowed for login, as shown in Figure 7-1.



Due to a recent increase in
won't be able to assign Tea

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Sign in allowed

☑ Microsoft Stream for O365 E3 SKU
Office 365 E3

☑ Microsoft Teams
Office 365 E3

□ Mobile Device Management for Office 365
Office 365 E3
This app is assigned at the organization level.

☑ Office 365 ProPlus
Office 365 E3

Figure 7-1. *Checking account provisioning*

- *The Microsoft Teams app itself* might have an issue. Perhaps the Teams app is not installed correctly on a user's computer, causing problems with reaching the Office 365/Microsoft services. Maybe the network that the user has connected to has connectivity issues. To resolve the Teams app issue, you could first update Teams and then check that the Internet is working correctly.
- The last category is *Teams back-end cloud service-related issues*. When there are service-related issues, all users in a tenant are affected or some users are affected at the back-end datacenter or region.
- You can collect the Teams diagnostic log and check if there are any issues. When reading these sign-in logs, pay attention to the first few errors or warning messages, as these will indicate the issue.

Teams Service Issues

As an administrator, it's crucial to keep a close eye on any issues related to the Teams service. When the Teams service experiences downtime, even if it's affecting only certain users or app services within Teams, it can result in performance degradation. Microsoft guarantees strict service-level agreements (SLAs) for all their online services, including Microsoft Teams. If these SLAs are not met, global admins have the ability to request refunds. It's best practice for admins to regularly monitor the Microsoft Health Dashboard and notify all users about any service degradation and its impact on Microsoft Teams. Here are some recommended methods for checking Microsoft's online service performance and updates:

1. **Check Microsoft 365 Service Health Dashboard:** Microsoft provides a Service Health Dashboard that displays the status of all their services, including Microsoft Teams. Here's how you can access it:
   - Go to the Microsoft 365 Service health status page at `https://portal.office.com/servicestatus`.
   - Sign in with your Microsoft 365 account.
   - Look for the status of Microsoft Teams. If there's an issue, it will be displayed here.
2. **Check the official Microsoft Teams Twitter account:** The Microsoft Teams Twitter account (`@MicrosoftTeams`) frequently updates about service disruptions, outages, or ongoing issues. They provide valuable information regarding widespread problems.
3. **Check DownDetector or similar websites:** Websites such as DownDetector and Outage.Report collect user feedback to indicate if others are encountering similar problems. You can look up "Microsoft Teams" on these websites to see if there is a surge in reported issues.
4. **Use third-party monitoring tools:** There are third-party monitoring tools available that can alert you in case of any issues with Microsoft Teams or other online services. Some examples of these tools are Pingdom, UptimeRobot, and StatusCake.

5. **Test on different devices and networks:** If you're not sure if the problem is with Microsoft Teams or your Internet, try logging in from different devices such as your computer, phone, or tablet. And check if it works on different networks like your home Wi-Fi, mobile data, or VPN. If it's still not working on any of those, then it's probably something up with Teams itself.

6. **Check for updates or announcements from Microsoft:** Sometimes Microsoft might have announced scheduled maintenance or updates that could impact service availability. Checking the Microsoft 365 blog or announcements might provide additional insight.

Occasional disruptions may occur due to maintenance, updates, or technical issues. Check official channels for status before assuming prolonged outages.

Approaching Teams Issues

Every admin has an individual approach to troubleshooting any issues. Here is the fundamental but beneficial approach that I take whenever dealing with any problem. For example, often admins receive complaints via call, incident report, or email that a user is unable to log in to the Microsoft Teams client. Here is the series of steps you can perform to solve the problem. The most important thing is the approach to the issue.

1. **Understand the problem:** What is not working? Is there any error message provided by the user? If there is not enough information, reach out to the user and make sure you understand the problem first. Once you grasp the problem, move on to step 2.

2. **Check if there is any pattern:** Is more than one user facing the issue? Is the whole site down, or just a single user?

   a. If more than one user is facing a log-in problem, then check if they are located in the same office, on the same network, and so on.

   b. If a single user is affected, check if that user is enabled for Microsoft Teams license. Check if the Teams sign-in ever worked or this is the first time the user is trying to sign in.

        i. Enabling a Teams license takes up to 12 hours. Typically a license is synced within an hour, but it sometimes takes longer.

        ii. Check login credentials, as user passwords might have changed, been locked out, or expired.

3. **Check if the problem is with the Teams app:** Try different Teams apps.

    a. Try with the Teams desktop app (Windows and macOS).

    b. Use a mobile app (iOS or Android).

    c. Try with a web browser sign-in using incognito mode (kind of isolated mode).

    d. If a specific client shows the issue, then clear the client cache and check again.

4. **Check different computers and different networks:** If all Teams apps show an error, then check internal versus external networks (using a mobile hotspot if no external network is available).

5. **Check if Teams login URLs are accessible:** If not, check with your network team to allow Teams communication.

6. If the issue still persists, then you can troubleshoot the issue with the information gathered, or you can open a support case with Microsoft.

Collecting Teams Client Logs

Microsoft Teams has three kinds of log files: debug logs, media logs, and desktop logs. Usually an admin can read debug logs to find the cause of Teams features not working; however, media and desktop logs are needed only if requested by Microsoft Support when you open a support case with Microsoft.

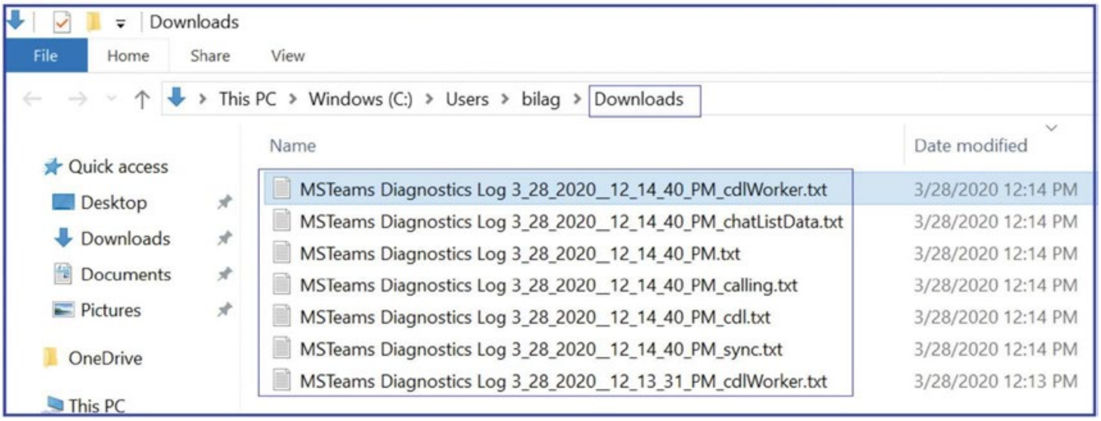
Microsoft Teams makes log collection reasonably easy. Just press a series of keys, and the Teams debug log will be collected and stored in the Downloads folder. Teams have different apps for different platforms, and each Teams app has a different method to collect logs; in addition, their log files are stored in a different location. Here are the details for each Teams app with the process for collecting a log.

First, the Teams debug log is the most common log. It is used for debugging Teams functionality and app-related issues. When you open a case with Microsoft support, they might ask you to generate a debug log. To read this log, you can use any text-based editor.

To generate a debug log for a Teams Windows client, follow this procedure:

1. Log in to the Teams client and then attempt to reproduce the issue, whether it is a call, chat, meeting join, desktop sharing, and so on.

2. While keeping the Teams Windows desktop client open, press Ctrl+Alt+Shift+1 on your keyboard. The Teams debug log is automatically downloaded and saved to the `%userprofile%\Downloads` folder, as shown in Figure 7-2.



Name	Date modified
MSTeams Diagnostics Log 3_28_2020_12_14_40_PM_cdlWorker.txt	3/28/2020 12:14 PM
MSTeams Diagnostics Log 3_28_2020_12_14_40_PM_chatListData.txt	3/28/2020 12:14 PM
MSTeams Diagnostics Log 3_28_2020_12_14_40_PM.txt	3/28/2020 12:14 PM
MSTeams Diagnostics Log 3_28_2020_12_14_40_PM_calling.txt	3/28/2020 12:14 PM
MSTeams Diagnostics Log 3_28_2020_12_14_40_PM_cdl.txt	3/28/2020 12:14 PM
MSTeams Diagnostics Log 3_28_2020_12_14_40_PM_sync.txt	3/28/2020 12:14 PM
MSTeams Diagnostics Log 3_28_2020_12_13_31_PM_cdlWorker.txt	3/28/2020 12:13 PM

Figure 7-2. *Downloaded Teams debug log*

For a Teams macOS client, follow these steps:

1. Log in to the Teams macOS client and then attempt to reproduce the issue, whether it is a call, chat, meeting join, desktop sharing, and so on.

2. While keeping the Teams desktop client open, press Option+Command+Shift+1 on your keyboard. The Teams debug log will be stored under downloads.

Note For the web browser, the Teams web app will prompt you to save the debug logs.

The Teams media log includes information about audio and video calling and desktop sharing. This log is needed when you open a Microsoft support case, as it will be inspected by Microsoft Support personnel. You don't have to do anything special to generate this log. It is automatically stored in the following paths.

- You can find the Teams Windows client media log at the following locations:
    - `%appdata%\Microsoft\Teams\media-stack\*.blog`
    - `%appdata%\Microsoft\Teams\skylib\*.blog`
    - `%appdata%\Microsoft\Teams\media-stack\*.etl`
- You can find the Teams macOS client media log at the following locations:
    - `~/Library/Application Support/Microsoft/Teams/media-stack/*.blog`
    - `~/Library/Application Support/Microsoft/Teams/skylib/*.blog`

The Teams desktop client log is identified as a bootstrapper log. It includes log data that occur between the desktop client and the browser. Similar to the media log, this log also is needed primarily when it is requested by Microsoft Support personnel. This log can be viewed via text editors.

To get the desktop log on a Teams Windows client, right-click the Microsoft Teams icon in your application tray, and select Get Logs, as shown in Figure 7-3.

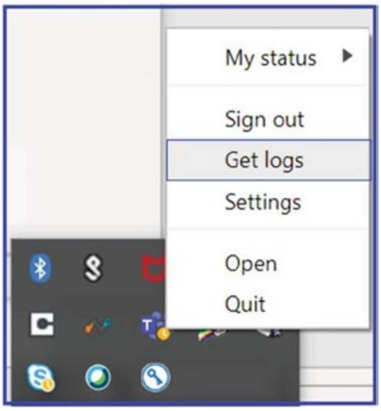


Figure 7-3. *Getting the Teams desktop log*

Teams desktop logs are stored on the path `%appdata%\Microsoft\Teams\logs.txt`.

For the Teams macOS client, from the Help pull-down menu, select Get Logs. Logs are then automatically saved to the path `~/Library/Application Support/Microsoft/Teams/logs.txt`.

Microsoft Teams Client-Side Troubleshooting

This topic covers Microsoft Teams client software installation and connectivity problems. To provide a consistent and positive experience to Teams end users, the client must be properly working without any issues. In this section, you will learn about troubleshooting Teams client installation and update issues, as well as Teams client connectivity issues.

Teams Client-Side Troubleshooting

Microsoft has provided Teams client apps for desktop (Windows and macOS), mobile (iOS and Android), Linux clients, and web clients. Users get similar experiences using these clients.

The Teams client is part of the Office 365 suite, so when the user installs Office 365 ProPlus as Click to Run, the Teams client is automatically installed. Admins can perform a managed Microsoft Installer (MSI) install as well.

If the Teams client is having issues such as not starting, restarting, hanging, and so on, then follow these steps to resolve client-side issues:

1. When the Teams client shows the issue, the first thing to do is update the Teams client. The Teams client auto-updates, but it is best practice to check for client updates. To do so, next to your profile picture, click the three dot (**...**) and then select Check For Updates, as shown in Figure 7-4, to install any available updates.

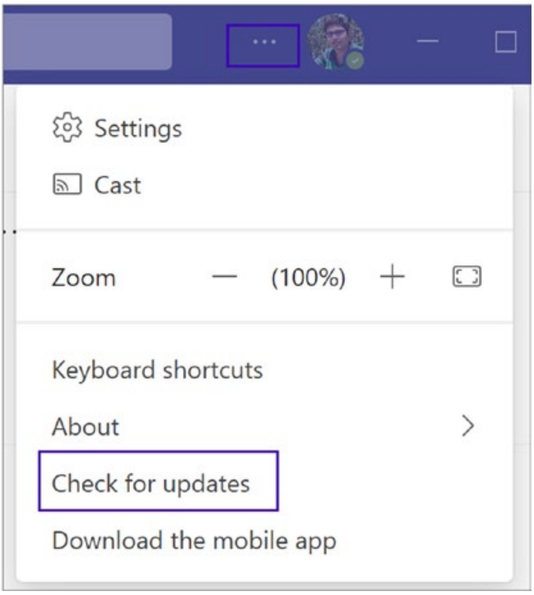


Figure 7-4. *Checking for Teams client updates (desktop client)*

2. If the issue persists after the Teams client updates, the next thing to do is check the client installer log. When the Teams client is installed, the Teams installer logs track the sequence of events. The installer log can be found at `%LocalAppData%\SquirrelTemp\SquirrelSetup.log`. Check this log to see if there is any error message or a call stack near the end of the log. Note that call stacks at the beginning of the log might not mean that an installation issue exists. It can be easier to compare the affected computer log against the log from a successful installation (even on another computer) to see what is expected.

3. If an issue persists, then uninstall the Teams client entirely and then log in to the Teams web client using `https://teams.microsoft.com`. Perform a desktop install by clicking the profile picture and then downloading and installing the Teams desktop app.

Microsoft Teams has various limitation**s** and expiration period**s** applied for each feature**:** persistent chat, voice and video calls, meeting, application sharing, file sharing, and so on. In Microsoft Teams, every workload has a different maximum limit set by Teams (back-end) services. Here I elaborate on maximum limits and expirations for Teams meetings, chat, live events, PowerPoint file uploads in a meeting, file store, and so on.

As an admin, you must know when and how Teams expiration and the maximum limit applies. This information will save troubleshooting time, so carefully review these limits and specifications.

Microsoft Teams Meeting Expiration and Time Limits: What You Need to Know

First, it's crucial to understand that a meeting URL in Microsoft Teams is designed to be perpetual; it will never expire. However, this does not apply to PSTN dial-in numbers, CVI coordinates, and specific meeting policies and settings, which do have expiration timelines.

Here are meeting-specific expirations:

- **Meet Now:** These spontaneous meetings will expire eight hours after they start. No extensions are applicable for Meet Now types.
- **Regular meeting without end time:** Such meetings will expire 60 days after their start time. If the meeting is initiated or updated, the 60-day expiration counter resets.
- **Regular meeting with end time:** These expire 60 days after their scheduled end time. Again, starting or updating the meeting resets the 60-day expiration time.

- **Recurring meeting without end time:** These types of meetings will also expire 60 days from their start time, and the counter resets upon each new meeting or update.
- **Recurring meeting with end time:** The expiration for these meetings occurs 60 days after the end time of the last occurrence in the series. The expiration time will reset if the meeting is updated.

It's worth noting that all Microsoft Teams meetings have an overall time limit of 30 hours, irrespective of the meeting type.

By understanding these expiration timelines and time limits, you can better manage your Microsoft Teams meetings, ensuring that you are in compliance with platform policies and making the most out of your collaborative efforts.

Microsoft Teams Meeting and Call Capacity: A Detailed Overview

Depending on your subscription plan, Microsoft Teams offers varied capacity limits for hosting online meetings and video calls. With plans like Microsoft 365 Business Basic, Business Standard, Business Premium, and Microsoft 365 A1, the platform allows up to 300 participants in a meeting. However, if you're subscribed to Microsoft 365 E3/E5, A3/A5, or Government G3/G5 plans, you can extend this limit to host meetings

For direct audio or video calls initiated from a chat, Microsoft Teams allows a maximum of 20 participants.

When it comes to sharing PowerPoint files in Teams, the maximum file size allowed is 2GB.

Teams offers local download availability for meeting recordings that aren't uploaded to Microsoft Stream; these recordings will be accessible for 20 days. Additionally, the maximum duration for a single meeting recording is limited to either 4 hours or 1.5GB. Upon reaching either of these limits, the recording will automatically stop and then restart.

It's important to note that breakout rooms can be created only in meetings with fewer than 300 participants. If you initiate breakout rooms in a meeting, the maximum participant count will automatically be capped at 300.

Note There is no limit set on how many Teams meeting can be hosted in one Office 365 tenant.

What Is the Maximum PowerPoint Presentation File Size Allowed in a Team Meeting?

Teams allows sharing content in Teams meetings and peer-to-peer calls. You can share and present PowerPoint presentations in a Teams meeting, for example. However, there is a specific file size limit allowed, up to 2GB. You cannot share or upload files larger than 2GB in Teams meetings.

What Is the Maximum Audience Limit of Teams Live Events?

Microsoft Teams live events are used for large broadcast meetings, such as all-staff meetings. The live event audience size maximum limit is 20,000 attendees, and the maximum duration is 4 hours. A user can host concurrent live events in an Office 365 tenant. However, as of this writing, you can host a maximum of 15 concurrent Teams live events in your organization.

What Is the Maximum Limit in Teams and Channels?

Microsoft Teams does have a maximum limit specified for Teams and channels features. Here is the list of features with their limits:

- The maximum number of teams a user can create is 250. Remember, for the 250-object limit, any directory object in Azure AD counts toward this limit. Global admins are exempt from this limit.
- The maximum number of teams a user can be a member of is 1,000. Individual users therefore cannot be part of more than 1,000 teams.
- The maximum number of members in a team is 25,000.
- The maximum number of owners per team is 100. It is a best practice to have at least two owners of a team to handle a single-point failure situation.
- The number of organization-wide teams allowed in any Teams tenant organization is five, so use the organization-wide teams wisely.
- The maximum number of members in an organization-wide team is 10,000, so you cannot have more than 10,000 members in one organization-wide team (the previous limit was 5,000 members).

- The number of teams a global admin can create is 500,000.
- The number of teams an Office 365 tenant can have is 500,000. This limit includes archived teams.
- The number of channels per team is limited to 200, which includes deleted channels. Please note that if you deleted a channel, the channel still counts into the limit until 30 days of the deletion. Please take action when the channel limit comes close to the maximum limit.
- Another significant limitation in Teams is that each team can have a maximum of 30 private channels, so use private channels carefully and create them only when it is required.

Note In Teams, deleted channels can be restored within 30 days. During these 30 days, a deleted channel continues to be counted toward the 200 channel per team limit. After 30 days, a deleted channel and its content are permanently deleted, and the channel no longer counts toward the limit.

Microsoft Teams Chat Limitations

In Teams, users who participate in chat conversations 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, users need at least an Exchange Online Plan 1 license for Legal Hold and eDiscovery in this case. So, keep this limitation in mind when you are using an Exchange hybrid environment.

Teams chat works on an Exchange back end, so Exchange messaging limits apply to the chat function within Teams as well. The maximum number of people in a private chat is 250.

If you have more than 20 people in a chat conversation, then the chat features such as Outlook automatic replies, Teams status messages, typing indicator, video and audio calling, sharing, and read receipts are turned off.

Another limitation is for files. The maximum number of file attachments in a chat conversation is 10. If the number of attachments exceeds this limit, then the chat participants will see an error message. The maximum chat size is approximately 28KB per post.

Teams Emailing a Channel Limitation

Sending an email to a team is a frequently used feature. 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:

- The message size limitation is 24KB. 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.
- The next limitation is for attachments. The number of file attachments is limited to 20. If the number of attachments or images exceeds this limit, the user will see an error message.
- The attachment size of each file is up 10MB. You cannot attach a file larger than 10MB while sending to Teams.
- The limitation for the number of inline images is 50.

Note Message size, file attachment, and inline image limits are the same across all Office 365 licenses.

What Is the Limitation for Teams Channel Names?

Microsoft Teams channel names cannot contain characters or words such as ~ # % & * { } + / \ : < > ? | ' ", . or characters in the ranges 0 to 1F and 80 to 9F.

Additionally, the words forms of CON, CONIN$, CONOUT$, PRN, AUX, NUL, COM1 to COM9, LPT1 to LPT9, desktop.ini, and _vti_ are not allowed. Also, Teams channel names cannot start with an underscore (_) or period (.), or end with a period (.).

Teams Client Connectivity Troubleshooting

Sometimes users face connection issues when trying to connect to Teams. The problem often occurs when the client cannot connect with the Microsoft cloud. Here are some tips to try when users face connectivity issues:

- Check if the Internet connection is working fine if you are working from home.
- If users face network issues from office locations, a majority of Teams connectivity issues are due to the corporate firewall or proxy blocking Teams service URLs, FQDNs, IP addresses, or ports. It is worth verifying that the required URLs, FQDNs, and IP addresses are allowed through a corporate firewall or proxy. To get a list of Teams URLs, FQDN, IP addresses, and ports, visit the Microsoft document at https://support.office.com/article/Office-365-URLs-and-IP-address-ranges-8548a211-3fe7-47cb-abb1-355ea5aa88a2.
- Quit the Microsoft Teams application and relaunch Microsoft Teams.
- Signing out of Microsoft Teams and resigning in with username and password.
- Clear the cache from your device. Clearing the cache for Windows and Mac are explained in the earlier section.
- If you are still facing the issue, log in to the web client by going to https://teams.microsoft.com/. If you are able to sign in to the web client, uninstall the Teams client and reinstall it.

Troubleshooting Audio and Video Call Quality in Microsoft Teams

Microsoft Teams offers real-time voice and video interactions through its VoIP features, along with various other functionalities. However, users may encounter issues such as audio disruptions, video pixelation, or disconnections during calls and meetings. Most of these problems stem from network inefficiencies or limitations on the user's device. Understanding and proactively addressing these issues can enhance the user experience and encourage the continued use of Microsoft Teams for organizational communication.

Common Issues and Their Causes

Here are some common issues:

- **Jitter:** This occurs when media data arrives at inconsistent rates, leading to incomplete or garbled audio. It's as if words or syllables get swallowed during the conversation.
- **Packet loss:** This refers to instances where segments of data are lost during transmission. This not only degrades the quality of the voice but can make speech almost unintelligible.
- **Latency:** Also known as round-trip time (RTT), latency results in a noticeable delay between the sender and receiver. This can lead to awkward conversational overlaps as both parties may begin speaking simultaneously due to the lag.

These issues generally arise from network complications such as high packet loss, latency, and jitter, which could also be compounded by resource limitations on the user's device.

Solutions for Better Quality

To rectify these quality concerns, consider implementing quality of service (QoS) settings, which can help prioritize Teams traffic over your network. By doing so, you allocate dedicated bandwidth for Teams' real-time applications, mitigating the impact of other bandwidth-consuming activities such as large file transfers or video streaming.

Here are some steps administrators can take:

- **Immediate issue resolution:** As soon as quality issues are reported or noticed, immediate action should be taken to identify the root cause. Diagnostic tools can help isolate the issue to either network conditions or user device constraints.
- **Consult network admin:** Collaboration with network administrators is essential for optimizing network settings. They can adjust firewall configurations and routing settings to reduce latency, packet loss, and jitter.

- **QoS implementation:** QoS is a vital feature that helps allocate network resources more efficiently. Please refer to Chapter 3 for detailed guidelines on implementing QoS and other advanced solutions such as split-tunnel VPNs.

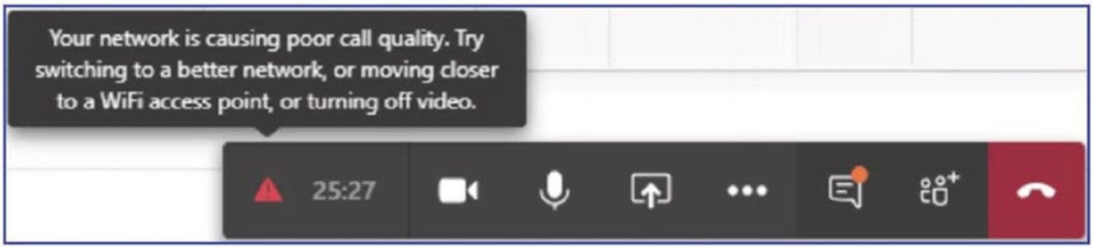
By addressing these issues strategically, you enhance the overall Teams experience, making it a more reliable tool for both internal and external communications.

Teams Audio and Video Call Quality Issues and Dependency

Let's talk about call quality issues and dependencies.

Network

Optimal call quality in Teams is dependent on good network conditions. The Teams apps will highlight network connectivity issues during the call, as shown in the example in Figure 7-5, which shows poor network conditions. Use a Network Assessment Tool to investigate network conditions and switch connectivity (e.g., wireless to wired) if possible. Expect a higher quality on a managed corporate network than on an unmanaged network like public Wi-Fi.



Your network is causing poor call quality. Try switching to a better network, or moving closer to a WiFi access point, or turning off video.

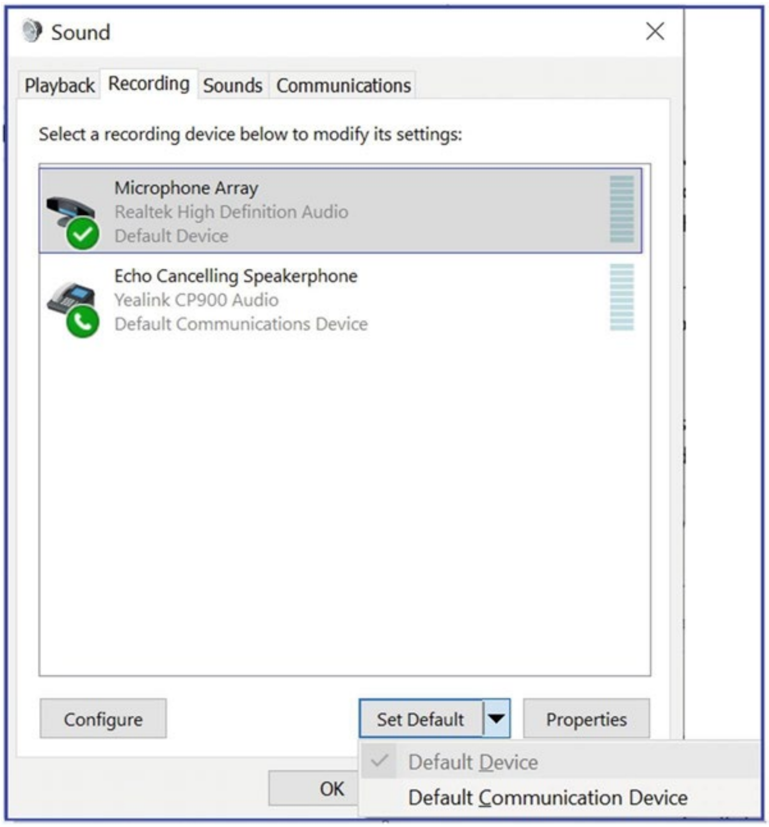
Figure 7-5. *Bad network quality in a Teams meeting*

Device

For the best audio and video quality, avoid using built-in audio devices; instead, use a USB device listed at `https://www.microsoft.com/en-us/microsoft-teams/across-devices/devices`. These devices are certified for the best audio and video quality. Here are a few best practices for troubleshooting devices:

- If a computer does not recognize a USB device, then connect the device to a different USB port, as the port might have an issue.
- Try connecting the device directly to the computer; avoid a USB hub for the headset or camera.
- Installing the latest device driver might remediate some audio and video quality issues. Using a headset on the microphone/line-in port of your computer is not a suitable replacement for a USB device, as these devices are also dependent on the computer's audio devices.
- Using a USB headset (headphones) prevents your microphone from picking up audio from your computer or background noise. Sometimes the sound is amplified and passed in and out frequently, resulting in unpleasant, loud static or scream. Remember, using a headset helps to eliminate sources of echo as well.
- If you are unable to use a headset, try to put as much distance as possible between your speakers and microphone to minimize any background noise.
- If you are planning to use a built-in audio device (considering the previously mentioned problems), set up your audio device correctly to manage your Windows audio device.

  a. First search for *Manage Audio Devices*. Select Recording and then select the playback device (headset) that you want to set as default for Teams as well as the computer. For example, in Figure 7-6, I selected Microphone Array (Realtek High Definition Audio).



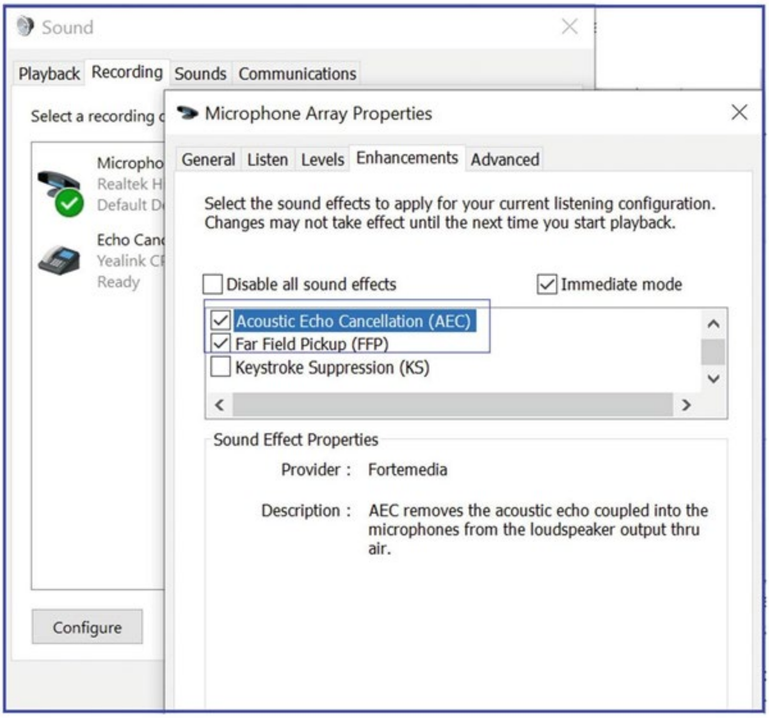
Select a recording device below to modify its settings:

Microphone Array
Realtek High Definition Audio
Default Device

Echo Cancelling Speakerphone
Yealink CP900 Audio
Default Communications Device

Figure 7-6. *Selecting a device and setting it as the default*

b. Click Properties to set the advanced options. Select the Enhancements tab and then select the Acoustic Echo Cancellation (AEC) and Far Field Pickup (FFP) check boxes, as shown in Figure 7-7.



Select the sound effects to apply for your current listening configuration. Changes may not take effect until the next time you start playback.

□ Disable all sound effects ☑ Immediate mode

☑ Acoustic Echo Cancellation (AEC)
☑ Far Field Pickup (FFP)
□ Keystroke Suppression (KS)

Sound Effect Properties

Provider : Fortemedia

Description : AEC removes the acoustic echo coupled into the microphones from the loudspeaker output thru air.

Figure 7-7. *Properties for a recording device*

How Teams Audio and Video Calls Work

Teams allow one-to-one audio and video calls as well as multiparty meetings. First, understand how a one-to-one audio and video calls work. For example, user Balu is calling user Chanda. Teams clients always send their chat service (signaling) traffic to the Teams service (Office 365 cloud) over 443/TCP. Refer to `https://learn.microsoft.com/en-us/microsoft-365/enterprise/urls-and-ip-address-ranges?view=o365-worldwide#skype-for-business-online-and-microsoft-teams` for port numbers and FQDNs used by Teams.

Teams audio/video and desktop sharing media traffic will prefer a direct connection over UDP. Teams prefer the most direct connection possible. To establish a connection in Teams, leverage the Interactive Connectivity Establishment (ICE) protocol to find the most optimal path to send media. In the example shown in Figure 7-8, direct connectivity between user Balu's computer and user Chanda's computer is possible, and both clients can send media directly between them.

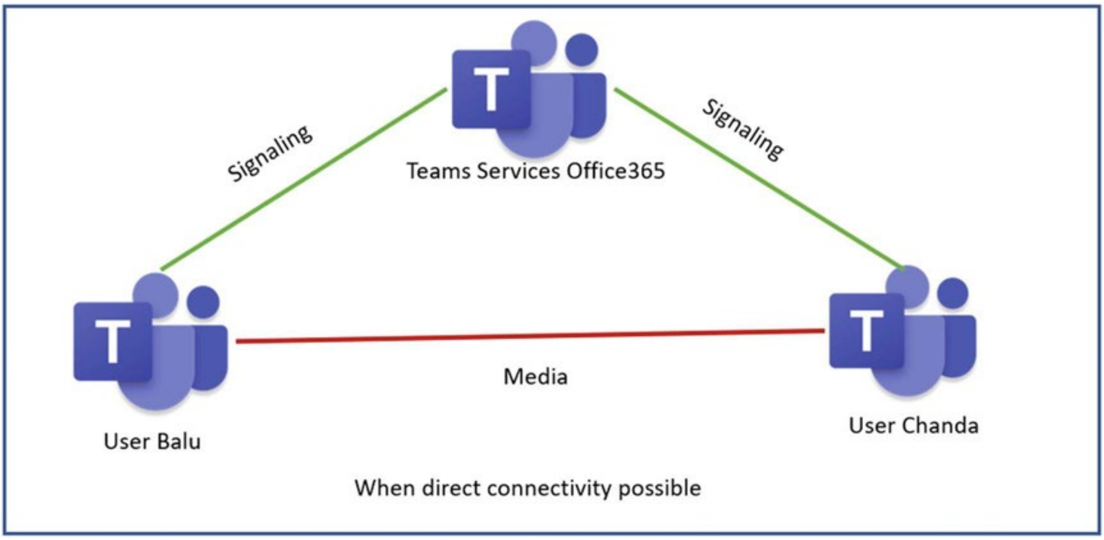


Figure 7-8. *Teams direct audio/video call*

If direct connectivity isn't possible because of a firewall between two endpoints, chat and content still go directly to the Teams service (Office/Microsoft 365 cloud) via 443 (most organizations always allow 443). This way, they can then exchange private chat, files, and so on. They also contribute to the same channels; as you can see in Figure 7-9, the firewall between them is not a problem for signaling traffic.

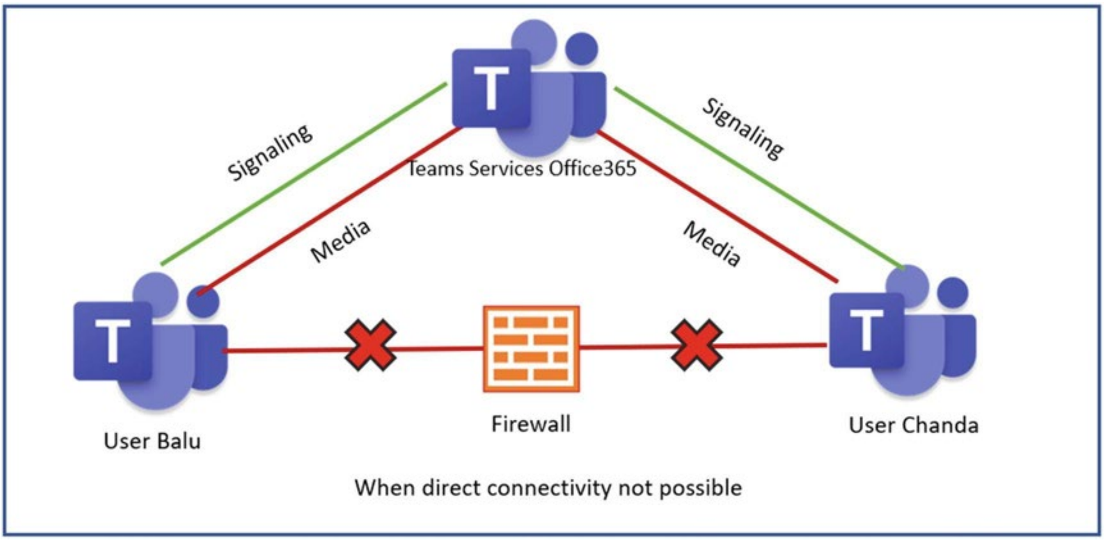


Figure 7-9. *Teams audio/video call via relay*

However, when they start the audio/video real-time session, the firewall blocks their traffic because a direct connection is not possible. In this situation, Teams uses a relay. Basically, user Balu will establish a connection with Office/Microsoft 365, and user Chanda will also establish a connection with Office 365 for this session. Office 365 Relay will proxy any real-time traffic to another relay to another user. User Balu and user Chanda can talk to each other even though there is no direct connectivity. Office/Microsoft 365 functions as a relay for the media traffic, if direct connections are not possible. This media path is not optimal because all client traffic has to go to the Office/Microsoft 365 relay first and then to other users, so this will affect latency and network jitter, but at least Teams allows audio and video instead of no call, which is important.

Teams typically use UDP on ports 3478-3481. If UDP is unavailable, Teams can fall back to TCP on port 443, but with suboptimal call quality.

There are some built-in tools in the Teams service that help you identify a call quality problem. For any issue, without identifying it, you cannot resolve it. Teams provide two tools, Call Analytics and Call Quality Dashboard (CQD), to use when you encounter call quality problems.

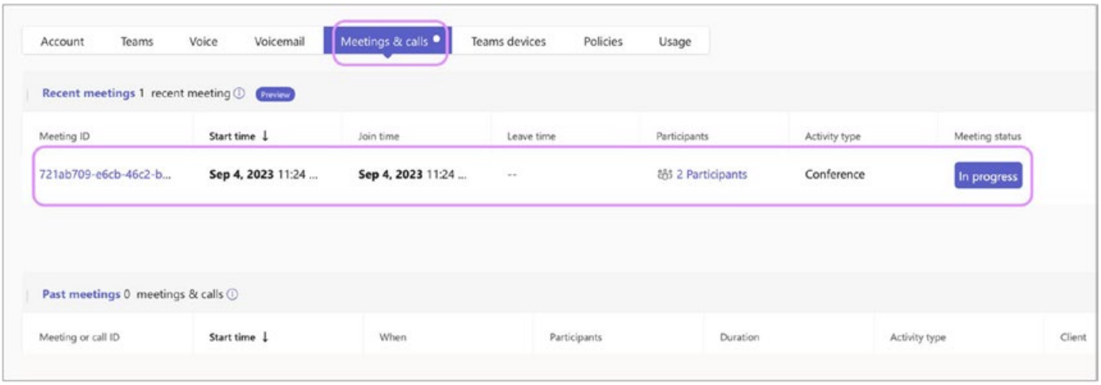
Call Analytics

This is my favorite tool, and I frequently use this when I troubleshoot individual users' call quality issues. Call Analytics provides detailed information about the user of the device connected, networks (internal or external, wired or wireless), and connectivity related to specific calls and meetings for each user in a Microsoft Teams or Skype for Business account. You, as an admin, can use Call Analytics to troubleshoot call quality and connection problems experienced in a specific call or meeting using the Teams admin center.

To access Call Analytics that can help you to identify and eliminate problems, follow these steps:

1. Log in to the Teams admin center and navigate to Users. Find the user who encountered a problem and then select that user to open the user's account properties. On the user page, on the right side, you can find the user's quality, activity, and active meetings. Click the quality to check the user's last 7 days' quality or troubleshoot live meetings by clicking "view active meetings."

2. Click “Meetings & calls,” which will show the detailed call history for the user, including the recent meetings and the past meetings. This section shows one-to-one calls and meeting audio quality. Figure 7-10 is a sample “Meetings & calls” tab.



Recent meetings 1 recent meeting

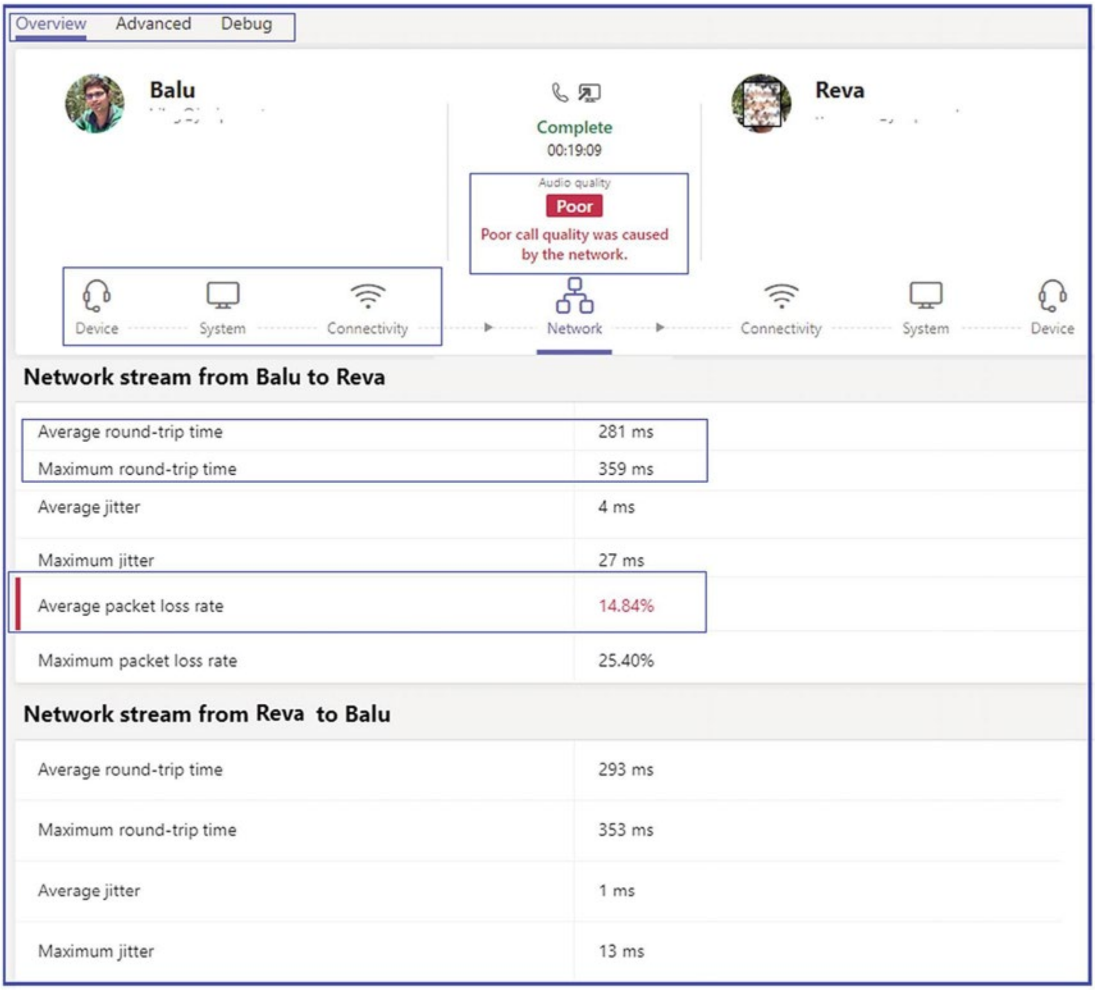
Meeting ID	Start time ↓	Join time	Leave time	Participants	Activity type	Meeting status
721ab709-e6cb-46c2-b...	Sep 4, 2023 11:24 ...	Sep 4, 2023 11:24 ...	--	2 Participants	Conference	In progress

Past meetings 0 meetings & calls

Meeting or call ID	Start time ↓	When	Participants	Duration	Activity type	Client

Figure 7-10. *Call Analytics*

3. When you select a particular meeting or call, you will see the call quality details, including device, system, connectivity, and network details. For example, in the example shown in Figure 7-11, I selected a call between Balu and Reva, which was marked as having poor audio quality. Clicking Network, it shows the average packet loss was more than 14 percent, which is very high, and the maximum packet loss rate was more than 25 percent, which is why the audio quality is marked as poor. The statistics also include network quality, including RTT (latency), jitter, and packet loss.



Balu
[redacted]

Complete
00:19:09

Audio quality
Poor
Poor call quality was caused by the network.

Reva
[redacted]

Network stream from Balu to Reva

Average round-trip time	281 ms
Maximum round-trip time	359 ms
Average jitter	4 ms
Maximum jitter	27 ms
Average packet loss rate	14.84%
Maximum packet loss rate	25.40%

Network stream from Reva to Balu

Average round-trip time	293 ms
Maximum round-trip time	353 ms
Average jitter	1 ms
Maximum jitter	13 ms

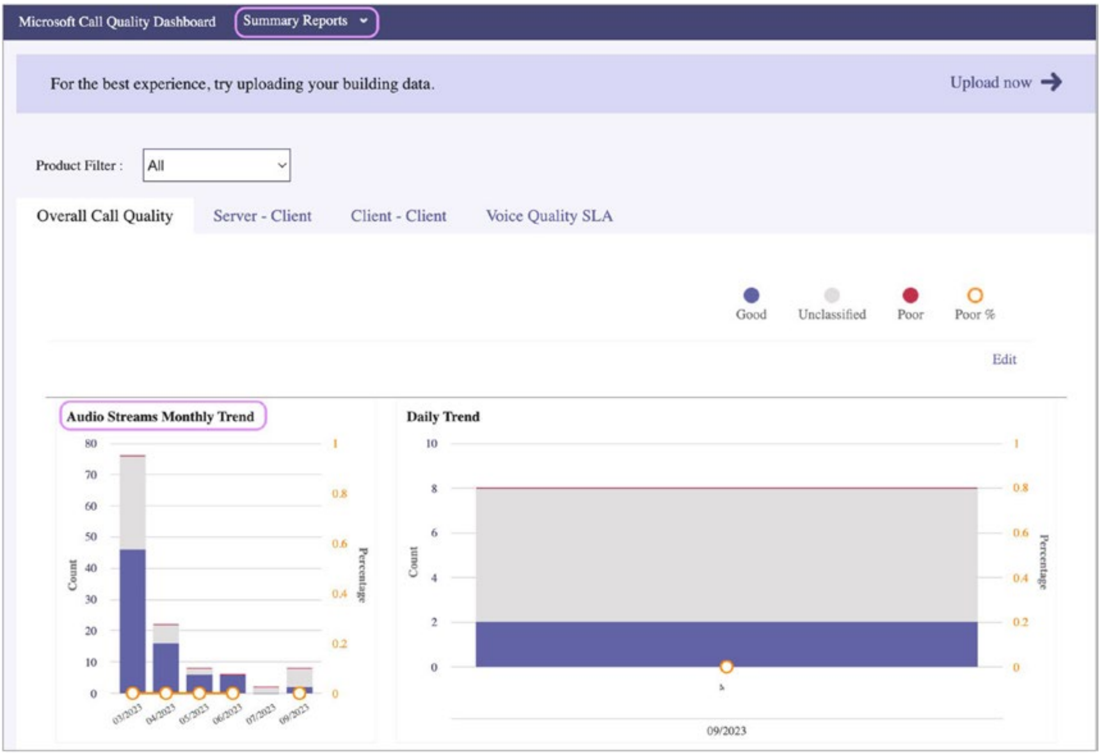
Figure 7-11. *One-to-one call network statistics*

4. If you are interested in doing a deeper dive, then click the Advanced tab or Debug tab, both of which show more details on what IP address, protocol, and port were used for the media session.

Microsoft Call Quality Dashboard

The CQD is designed to help Teams admins and network engineers optimize their overall network. You cannot analyze and troubleshoot a single call using CQD. It allows us instead to look at combined information for an entire organization. This can also help you to identify and reduce problems that are on the whole site or network. Figure 7-12 shows the overall audio quality in a tenant. You can access CQD in two ways.

- You can log in to the Teams admin center and then select Call Quality Dashboard. Click Sign In to access overall call quality and summary.
- Alternatively, you can visit `https://cqd.teams.microsoft.com/` and log in to access the CQD. Figure 7-12 shows a display of monthly and daily Teams audio trends.



Microsoft Call Quality Dashboard

Summary Reports

For the best experience, try uploading your building data.

Upload now →

Product Filter : All

Overall Call Quality | Server - Client | Client - Client | Voice Quality SLA

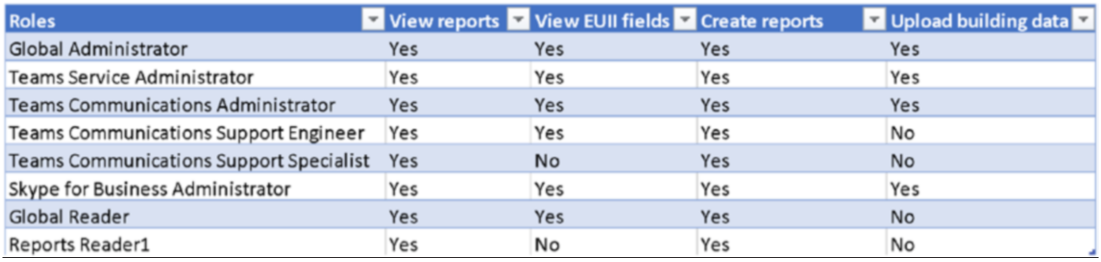
Figure 7-12. CQD displaying overall call quality

The Call Quality Dashboard offers basic reporting features that allow administrators to review the quality of audio, video, and client connectivity during meetings. However, to fully utilize the potential of this dashboard, administrators can upload building data. This building data, in the form of a CSV file, contains essential information about a building's location, subnets, and subnet masks associated with it. By uploading this data, administrators can better understand the call quality metrics and how they relate to a building's network infrastructure.

To upload the building data to the call quality dashboard, follow these steps:

- Navigate to https://cqd.teams.microsoft.com/ and log in using Teams admin credentials. Table 7-2 lists the roles that grant admin permissions to upload tenant data.

Table 7-2. *Teams Role and Permission to Upload Tenant and Report View*



Roles	View reports	View EUII fields	Create reports	Upload building data
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
Global Reader	Yes	Yes	Yes	No
Reports Reader1	Yes	No	Yes	No

- To upload tenant data, click the settings and select "upload tenant data." Then, choose Building as the data type file. Before selecting a file, ensure that the building data file is complete. The CSV file must be filled with accurate information to reflect the data. Her Table 7-3 shows the file format for the CSV file.

Table 7-3. *Building Data 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[4]
BuildingType	String	IT Termination	Optional[4]
BuildingOfficeType	String	Engineering	Optional[4]
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

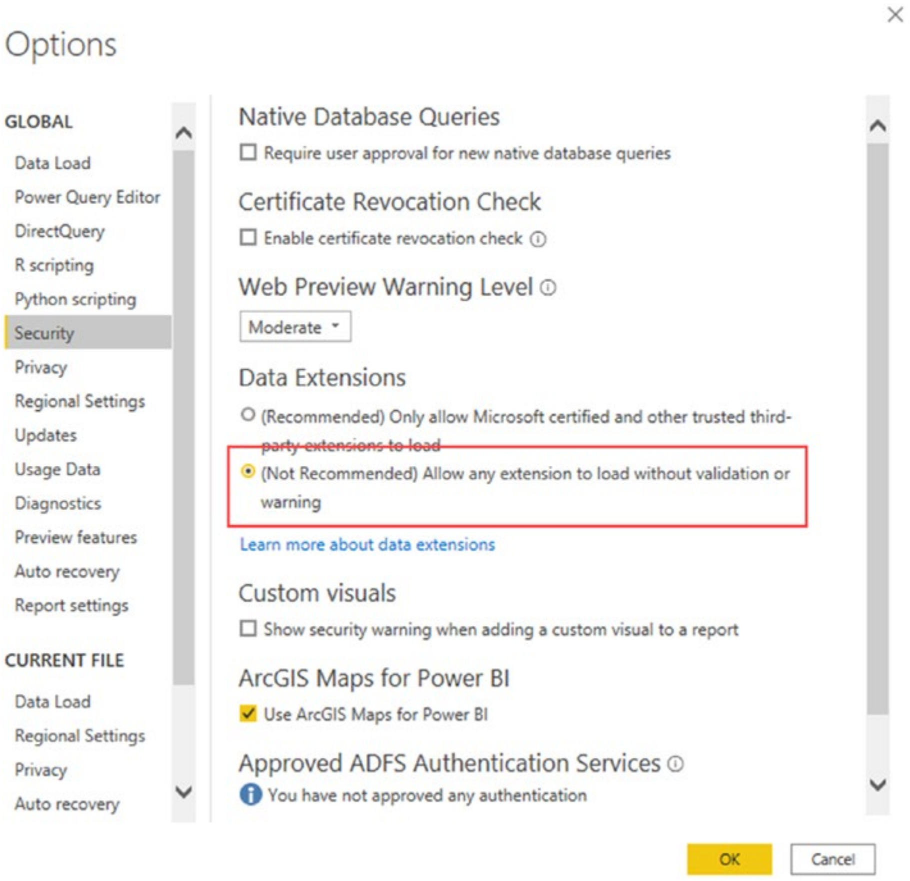
- Please make sure to fill in all the necessary information for each site, and use CIDR subnets. Remember to use 1 and 0 to indicate YES or NO in the last three columns

Once the document has been filled in correctly, remove the headers (first row), save the file as a CSV, and upload the data. Finally, select the desired date and click Upload. Keep in mind that it may take up to 24 hours, and sometimes 48 to 72 hours, for the data to be displayed. If you encounter any errors while uploading the file, ensure that the headers have been removed.

Administrators can view building network data after 24 hours and select from available reports. Once the CQD dashboard with building data becomes available, it can be used as a data source to connect with intelligent tools like Power BI. Power BI is a powerful tool that can help create interactive and insightful dashboards. By creating a call quality dashboard with Power BI templates, administrators can easily visualize and analyze call quality data in an effective manner. Microsoft provides Power BI templates, including quality of experience reports, auto-attendant and call queue historical reports, devices reports, summary reports, etc. Administrators can download Power BI templates from the Microsoft download center (`https://www.microsoft.com/en-us/download/details.aspx?id=102291`). If administrators are planning to use these templates, here are recommended steps:

1. Check if your computer already has the folder named `[Documents]\Power BI Desktop\Custom Connectors`. If you can't find it, create this folder now. Once done, download or use the connector file (`*.pqx` file) that you have received and place it in the Custom Connectors directory you created in earlier

2. Next, launch Power BI Desktop and select File ➤ Options and settings ➤ Options ➤ Security. Under Data Extensions, locate the option that says "(Not Recommended) Allow any extension to load without validation or warning" and select it. By doing so, you will be able to load the connector file without any issues. Refer to Figure 7-13 to see the security options in Power BI.



Native Database Queries

□ Require user approval for new native database queries

Certificate Revocation Check

□ Enable certificate revocation check

Web Preview Warning Level

Moderate

Data Extensions

○ (Recommended) Only allow Microsoft certified and other trusted third-party extensions to load

● (Not Recommended) Allow any extension to load without validation or warning

Learn more about data extensions

Custom visuals

□ Show security warning when adding a custom visual to a report

ArcGIS Maps for Power BI

☑ Use ArcGIS Maps for Power BI

Approved ADFS Authentication Services

You have not approved any authentication

Figure 7-13. *Power BI security options*

3. Select the OK button and then restart Power BI Desktop. Next, navigate to File and select Open Reports, followed by Browse Reports. Change the file type to Power BI Template files (*.pbit). Finally, locate and select the QER template you downloaded, and then click Open.

4. If you are prompted, sign in to the Microsoft Call Quality Dashboard using your administrative credentials that have access to the CQD. Once you have signed in, the template will open, and you will be connected to the CQD. You can confirm that you are connected to the CQD by checking the Fields pane for a list of dimensions and measures.

Teams Phone System Call Troubleshooting

Microsoft Teams only supports E.164 format numbers, so make sure to configure E.164 format phone numbers.

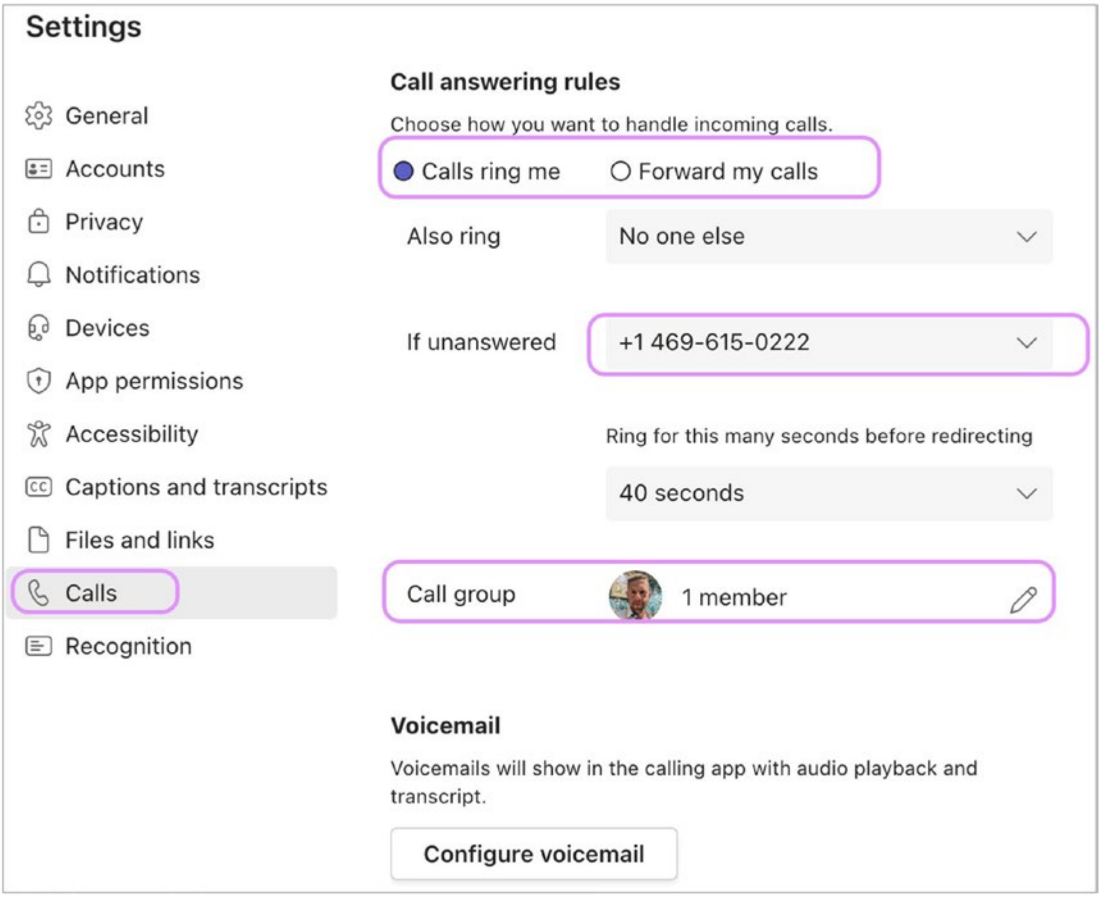
Customizing Call Features in Teams Client

In Teams client, you can configure how you want to handle incoming calls. To do so, log in to the Teams (desktop) client and then click your profile picture. Click Settings and then click “Calls, In” to configure how you want to handle calls. You might want to ring calls to your Teams client, or you might want to forward phone calls to a different phone number. Here are the steps:

1. When you select the Calls Ring Me option, you can also choose the Also Ring option to simultaneously ring another phone number.

2. Select If Unanswered, and then select Send To Voicemail, Another Number Or Call Group, or Do Nothing, which is the default.

3. If you opt to redirect to another number, then enter the period after which you want to redirect this call. The example in Figure 7-14 shows 40 seconds. The default is 20 seconds before the unanswered call is forwarded to a PSTN number.



Settings

Call answering rules

Choose how you want to handle incoming calls.

● Calls ring me ○ Forward my calls

Also ring: No one else

If unanswered: +1 469-615-0222

Ring for this many seconds before redirecting: 40 seconds

Call group: 1 member

Voicemail

Voicemails will show in the calling app with audio playback and transcript.

***Figure 7-14.** Call answering options*

All these features matter for the user experience, and the settings are quite self-explanatory.

Phone Dial Pad Is Missing in Teams

In Teams, if a dial pad is missing, users cannot make outbound calls (but users can receive inbound calls). There are some prerequisites that need to be fulfilled to have a phone dial pad in the Teams client. Ensure the following things are in place to use a phone dial pad in Teams:

1. Users must have a valid Teams Phone System (Microsoft 365 Phone System) license assigned.
2. Users should have enterprise voice enabled. If not, then run this PowerShell command to enable the user for enterprise voice in Teams:

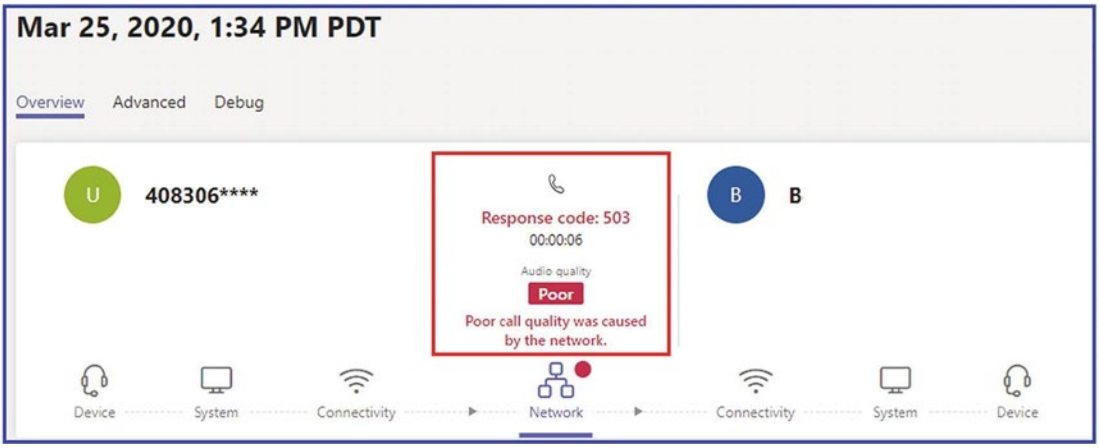
   ```
   Set-CsUser -Identity "<User name>"
   -EnterpriseVoiceEnabled $true -HostedVoiceMail $true
   ```

3. If you are using Teams Direct Routing, then make sure users have an OnpremiseLineURI number assigned or Microsoft Calling Plan and online phone number assigned to the user.
4. To work with outbound calls, assign a voice routing policy with proper PSTN usage and routes.

Troubleshooting Call Failures with Call Analytics

Whenever Teams client attempts a phone call, it captures some call quality and diagnostics information. That information is used by the Teams service and analyzed by Teams Call Analytics. Teams Call Analytics is the best tool to check call failures.

To access Call Analytics, you must have the appropriate permissions. To access Call Analytics, log in to the Teams admin center, navigate to Users, and then find the user you want to access. Once the user page opens, click Call History and then find the PSTN call that has a problem. For example, Figure 7-15 shows a short call that has an issue.



Mar 25, 2020, 1:34 PM PDT

Response code: 503
00:00:06
Audio quality
Poor
Poor call quality was caused by the network.

Figure 7-15. *Teams PSTN call*

There are different call failures and codes you might see in Call Analytics such as Response code 486, Response code 408, Failed destination does not exist, 404 not found, and so on.

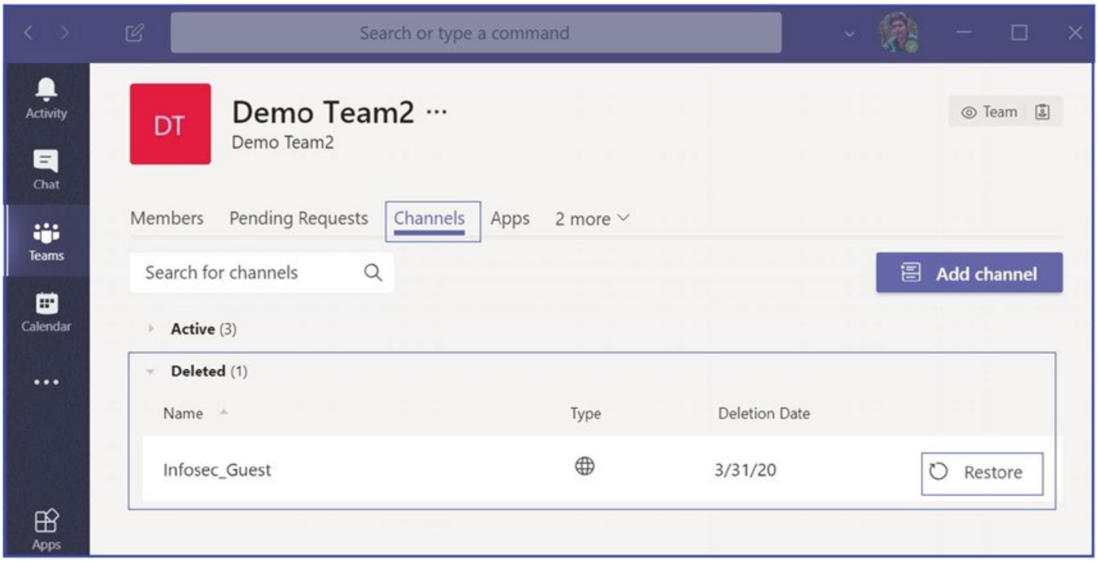
Unable to Connect to Voicemail in Teams

If you are unable to connect to voicemail using the Teams client, then the first thing you can do is download the Teams diagnostics log. For Windows, press Ctrl+Alt+Shift+1; for macOS, use Command+Option+Shift+1. Open the downloaded log file and search for Voicemail-List, and then review any ERR messages. That is your signal to troubleshoot the issue further.

Understand that Microsoft Teams is tightly integrated with Exchange (Outlook), and if there is an issue, then Teams and Outlook connectivity will be broken. Check that Outlook is connecting, and check the user credentials.

Restoring a Deleted Channel

A team owner can restore a deleted channel. To restore a deleted channel, navigate to Teams. Then next to the team's name, click more options (**...**), and select Manage Channel. Click the Channels tab and then expand the Deleted section. Click Restore, as shown in Figure 7-16.



Name	Type	Deletion Date
Infosec_Guest	🌐	3/31/20

__Figure 7-16.__ Restoring a deleted channel

Available Tools for Effective Troubleshooting

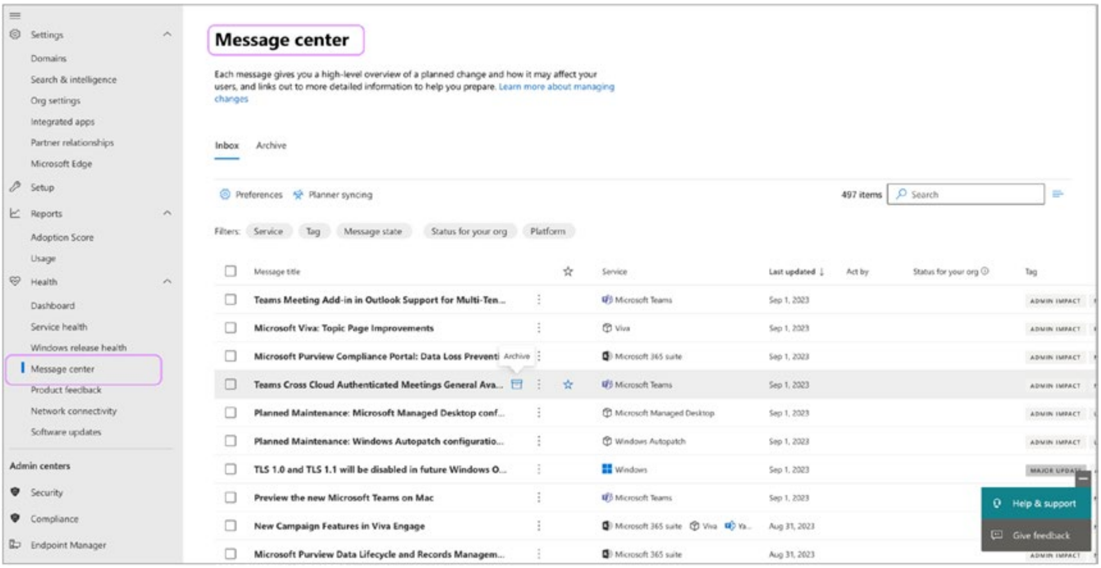
Microsoft Teams is dependent on different Office 365 services, such as SharePoint Online, Exchange Online, Skype next-gen, OneDrive for Business, and so on. Therefore, if a dependent service fails, it directly affects Teams performance. This makes checking Teams service health, network connectivity, and performance very important.

Verifying the Teams Service's Health Using the Health Tool

To ensure the overall health of Microsoft Teams, you can use Service Health, Message Center, and Directory Sync status subtools provided by Microsoft. You can find Service Health for Microsoft Teams on the main page of the Office/Microsoft 365 admin portal. It is highly recommended that you frequently check and validate Teams through Service Health. In case you encounter any issues with the Teams service, it is important to first confirm that the Teams service is healthy before doing any further troubleshooting.

Microsoft Teams is built on top of Office 365 services, so when checking Service Health, consider checking the status of Exchange, SharePoint, and OneDrive for Business. Service Health issues for these other services do not automatically mean that Teams is affected (e.g., Address Book downloads in Exchange are unavailable), but you should review the advisories for those affected services to determine if there is an impact to Microsoft Teams.

As an admin, it is important to stay up to date with Microsoft Teams' service improvements and feature updates. To do this, keep an eye on the Microsoft's official documentation, notifications, and alerts. If there is any service degradation, you will receive a message, notification, or alert. Therefore, it is essential to check the Message Center regularly, which is located in the Office 365 admin center under Health. You can access the Message Center by navigating to Health and then selecting Message Center, as shown in Figure 7-17.



Message center

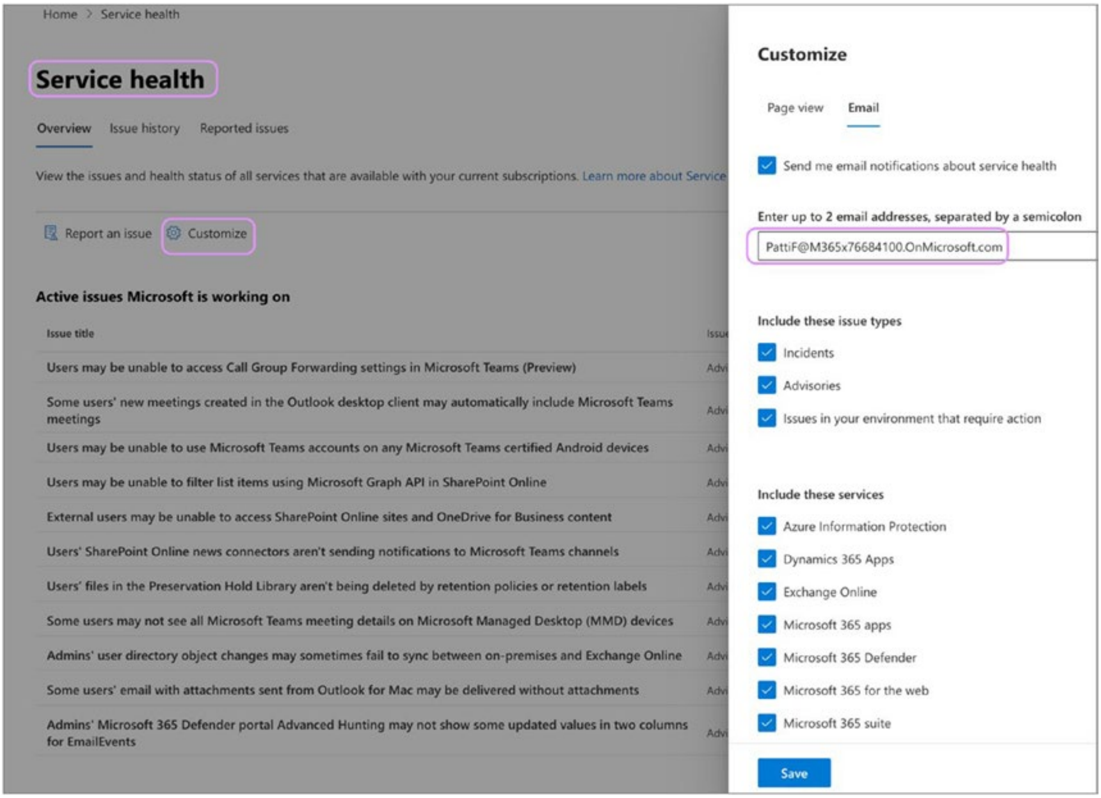
Each message gives you a high-level overview of a planned change and how it may affect your users, and links out to more detailed information to help you prepare. Learn more about managing changes

Message title	Service	Last updated ↓	Act by	Status for your org	Tag
Teams Meeting Add-in in Outlook Support for Multi-Ten...	Microsoft Teams	Sep 1, 2023			ADMIN IMPACT
Microsoft Viva: Topic Page Improvements	Viva	Sep 1, 2023			ADMIN IMPACT
Microsoft Purview Compliance Portal: Data Loss Preventi	Microsoft 365 suite	Sep 1, 2023			ADMIN IMPACT
Teams Cross Cloud Authenticated Meetings General Ava...	Microsoft Teams	Sep 1, 2023			ADMIN IMPACT
Planned Maintenance: Microsoft Managed Desktop conf...	Microsoft Managed Desktop	Sep 1, 2023			ADMIN IMPACT
Planned Maintenance: Windows Autopatch configuratio...	Windows Autopatch	Sep 1, 2023			ADMIN IMPACT
TLS 1.0 and TLS 1.1 will be disabled in future Windows O...	Windows	Sep 1, 2023			MAJOR UPDA
Preview the new Microsoft Teams on Mac	Microsoft Teams	Sep 1, 2023			
New Campaign Features in Viva Engage	Microsoft 365 suite Viva Ya...	Aug 31, 2023			
Microsoft Purview Data Lifecycle and Records Managem...	Microsoft 365 suite	Aug 31, 2023			ADMIN IMPACT

Figure 7-17. *Message center showing active and unread messages*

Checking Teams Service Health

Frequently checking the health of Teams and dependent services is highly recommended. You can automate service health notification by setting email, so whenever service degradation happens, you will receive an email alert. To set an email for notification, log in to the Microsoft admin center and navigate to Health. Select Service Health, and then click Customize. In the email window, turn on “send me email notifications about Service Health” and add two email addresses that can receive a proactive notification via email, as shown in Figure 7-18.



Home > Service health

Service health

Overview Issue history Reported issues

View the issues and health status of all services that are available with your current subscriptions. Learn more about Service

Report an issue Customize

Active issues Microsoft is working on

Issue title	Issu
Users may be unable to access Call Group Forwarding settings in Microsoft Teams (Preview)	Advi
Some users' new meetings created in the Outlook desktop client may automatically include Microsoft Teams meetings	Advi
Users may be unable to use Microsoft Teams accounts on any Microsoft Teams certified Android devices	Advi
Users may be unable to filter list items using Microsoft Graph API in SharePoint Online	Advi
External users may be unable to access SharePoint Online sites and OneDrive for Business content	Advi
Users' SharePoint Online news connectors aren't sending notifications to Microsoft Teams channels	Advi
Users' files in the Preservation Hold Library aren't being deleted by retention policies or retention labels	Advi
Some users may not see all Microsoft Teams meeting details on Microsoft Managed Desktop (MMD) devices	Advi
Admins' user directory object changes may sometimes fail to sync between on-premises and Exchange Online	Advi
Some users' email with attachments sent from Outlook for Mac may be delivered without attachments	Advi
Admins' Microsoft 365 Defender portal Advanced Hunting may not show some updated values in two columns for EmailEvents	Advi

Customize

Page view Email

☑ Send me email notifications about service health

Enter up to 2 email addresses, separated by a semicolon

PattiF@M365x76684100.OnMicrosoft.com

Include these issue types

☑ Incidents

☑ Advisories

☑ Issues in your environment that require action

Include these services

☑ Azure Information Protection

☑ Dynamics 365 Apps

☑ Exchange Online

☑ Microsoft 365 apps

☑ Microsoft 365 Defender

☑ Microsoft 365 for the web

☑ Microsoft 365 suite

Save

Figure 7-18. *Service Health email notification settings*

Once you add a new email address or change the existing email address, it could take up to 8 hours for these changes to take effect. Sometimes it can take up to 12 hours to apply a policy, although in general they take an hour. Microsoft has a 24-hour SLA for any policy changes to apply because the Teams service resides in Office/Microsoft 365 cloud, and user objects might be on-premises.

Microsoft Teams Network Assessment Tool

When a user reports connectivity and quality issues during Teams calls, you can use the Network Assessment Tool to test network connectivity and quality from the user's location to Teams media services. This tool is very useful in analyzing network quality by running a set of packets to the closest edge site and back for approximately 20 seconds, for a configured number of iterations. The Network Assessment Tool helps in analyzing the connection to Microsoft Network Edge (peering point).

Types of Test

This tool is named Microsoft Teams Network Assessment Tool. You can run this tool on Windows 8 or later operating systems. It helps test network connectivity as well as network performance.

- **For network connectivity:** This tool verifies the network and network elements between the test location and the Microsoft network are correctly configured to enable communication to the IP addresses and ports (using UDP and TCP) needed for Microsoft Teams calls. The addresses and ports are listed at https://support.office.com/en-us/article/Office-365-URLs-and-IP-address-ranges-8548a211-3fe7-47cb-abb1-355ea5aa88a2#bkmk_teams.
- **For network performance:** To check the network, this tool tests the connection to Microsoft Network Edge by running audio packets to the nearest edge site and back for approximately 17 seconds for a configured number of iterations. The tool collects packet loss, jitter, round-trip latency, and packet reorder percentage from each call. The results from a set of test calls can be analyzed to determine if it meets the media quality and performance targets described at https://support.office.com/en-us/article/Media-Quality-and-Network-Connectivity-Performance-in-Skype-for-Business-Online-5fe3e01b-34cf-44e0-b897-b0b2a83f0917. These targets and testing apply to Microsoft Teams calls only.

Using the Network Assessment Tool

It's a general recommendation to run the Microsoft Teams Network Assessment Tool from each network or subnet location that will support Teams users to validate port connectivity and media quality.

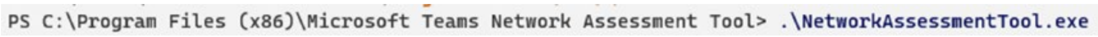
The Teams Network Assessment Tool should be run from a Windows 8 PC or later OS versions. The following conditions should be met to ensure the tool provides accurate results:

- Download and install the tool from the Microsoft download center at `https://www.microsoft.com/en-US/download/details.aspx?id=103017`.
- Windows updates disabled
- Sleep mode disabled
- PC should be idle with no users using the PC during testing
- PC can be locked but not logged off during testing period
- Security software scanning disabled

Additional details about the tool can be found in the Teams Network Assessment Tool installation folder in a Word file named `Usage.docx`.

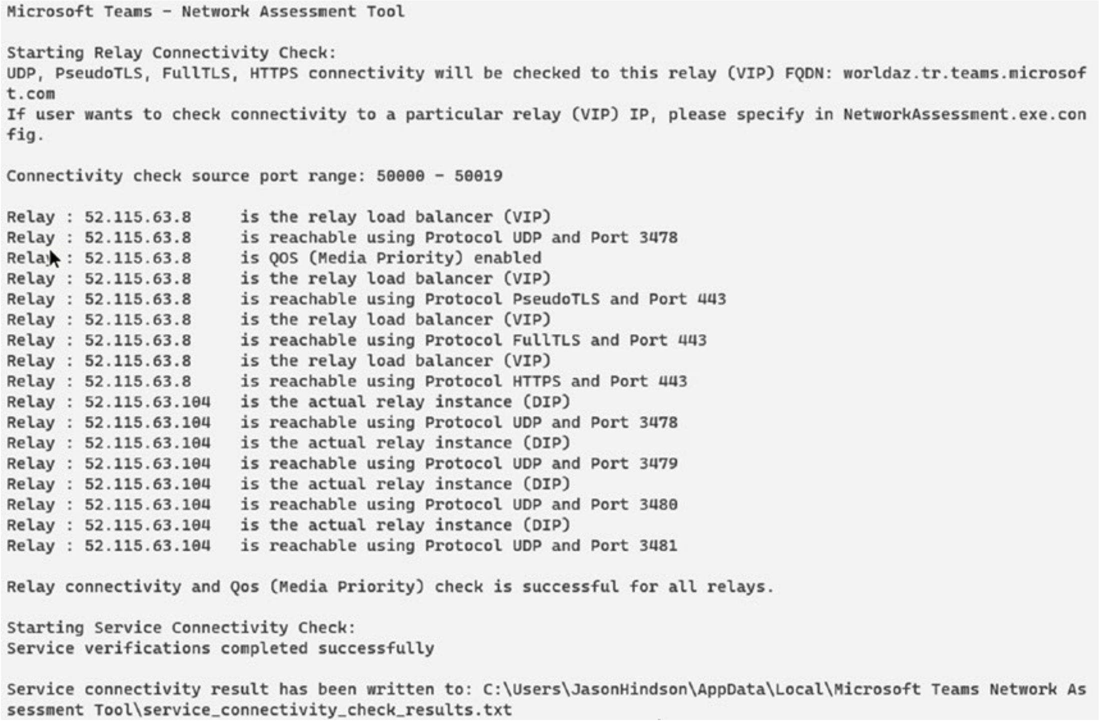
The Network Assessment tool can run connectivity checks to ensure all required outbound ports to Microsoft Teams are open. If the connectivity checks report blocked ports, those ports should be opened on the firewall before running the media quality tests with the Network Assessment Tool. To run the port connectivity checks, follow these steps:

1. Open a PowerShell session browse to the installation location, typically `C:\Program Files (x86)\Microsoft Teams Network Assessment Tool`.
2. Run the following command:



```
PS C:\Program Files (x86)\Microsoft Teams Network Assessment Tool> .\NetworkAssessmentTool.exe
```

3. After approximately two minutes, results like the following should be displayed: Refer to Figure 7-19 for the Network Assessment Tool results.



```
Microsoft Teams - Network Assessment Tool

Starting Relay Connectivity Check:
UDP, PseudoTLS, FullTLS, HTTPS connectivity will be checked to this relay (VIP) FQDN: worldaz.tr.teams.microsof
t.com
If user wants to check connectivity to a particular relay (VIP) IP, please specify in NetworkAssessment.exe.con
fig.

Connectivity check source port range: 50000 - 50019

Relay : 52.115.63.8     is the relay load balancer (VIP)
Relay : 52.115.63.8     is reachable using Protocol UDP and Port 3478
Relay : 52.115.63.8     is QOS (Media Priority) enabled
Relay : 52.115.63.8     is the relay load balancer (VIP)
Relay : 52.115.63.8     is reachable using Protocol PseudoTLS and Port 443
Relay : 52.115.63.8     is the relay load balancer (VIP)
Relay : 52.115.63.8     is reachable using Protocol FullTLS and Port 443
Relay : 52.115.63.8     is the relay load balancer (VIP)
Relay : 52.115.63.8     is reachable using Protocol HTTPS and Port 443
Relay : 52.115.63.104   is the actual relay instance (DIP)
Relay : 52.115.63.104   is reachable using Protocol UDP and Port 3478
Relay : 52.115.63.104   is the actual relay instance (DIP)
Relay : 52.115.63.104   is reachable using Protocol UDP and Port 3479
Relay : 52.115.63.104   is the actual relay instance (DIP)
Relay : 52.115.63.104   is reachable using Protocol UDP and Port 3480
Relay : 52.115.63.104   is the actual relay instance (DIP)
Relay : 52.115.63.104   is reachable using Protocol UDP and Port 3481

Relay connectivity and Qos (Media Priority) check is successful for all relays.

Starting Service Connectivity Check:
Service verifications completed successfully

Service connectivity result has been written to: C:\Users\JasonHindson\AppData\Local\Microsoft Teams Network As
sessment Tool\service_connectivity_check_results.txt
```

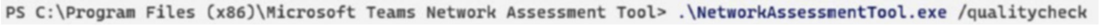
Figure 7-19. *Network Assessment Tool results*

4. Analyze the results and address any unreachable ports with appropriate network team resources

Once the port connectivity checks have completed successfully, you should test the media quality. Follow these steps to run the media quality tests:

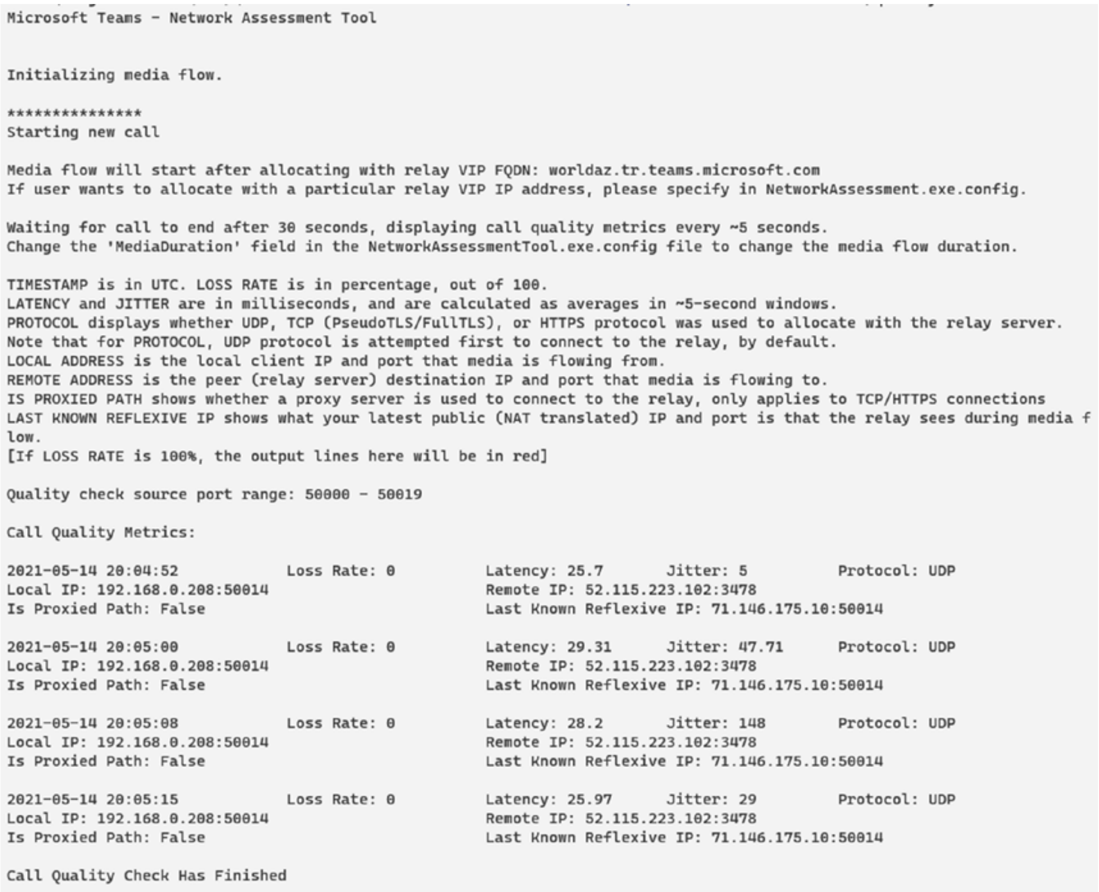
1. Open a PowerShell session browse to the installation location, typically `C:\Program Files (x86)\Microsoft Teams Network Assessment Tool`.

2. Run the following command:



```
PS C:\Program Files (x86)\Microsoft Teams Network Assessment Tool> .\NetworkAssessmentTool.exe /qualitycheck
```

3. Refer to Figure 7-20 for the Network Assessment Tool results.



```
Microsoft Teams - Network Assessment Tool


Initializing media flow.

***************
Starting new call

Media flow will start after allocating with relay VIP FQDN: worldaz.tr.teams.microsoft.com
If user wants to allocate with a particular relay VIP IP address, please specify in NetworkAssessment.exe.config.

Waiting for call to end after 30 seconds, displaying call quality metrics every ~5 seconds.
Change the 'MediaDuration' field in the NetworkAssessmentTool.exe.config file to change the media flow duration.

TIMESTAMP is in UTC. LOSS RATE is in percentage, out of 100.
LATENCY and JITTER are in milliseconds, and are calculated as averages in ~5-second windows.
PROTOCOL displays whether UDP, TCP (PseudoTLS/FullTLS), or HTTPS protocol was used to allocate with the relay server.
Note that for PROTOCOL, UDP protocol is attempted first to connect to the relay, by default.
LOCAL ADDRESS is the local client IP and port that media is flowing from.
REMOTE ADDRESS is the peer (relay server) destination IP and port that media is flowing to.
IS PROXIED PATH shows whether a proxy server is used to connect to the relay, only applies to TCP/HTTPS connections
LAST KNOWN REFLEXIVE IP shows what your latest public (NAT translated) IP and port is that the relay sees during media f
low.
[If LOSS RATE is 100%, the output lines here will be in red]

Quality check source port range: 50000 - 50019

Call Quality Metrics:

2021-05-14 20:04:52          Loss Rate: 0          Latency: 25.7       Jitter: 5          Protocol: UDP
Local IP: 192.168.0.208:50014                      Remote IP: 52.115.223.102:3478
Is Proxied Path: False                             Last Known Reflexive IP: 71.146.175.10:50014

2021-05-14 20:05:00          Loss Rate: 0          Latency: 29.31      Jitter: 47.71      Protocol: UDP
Local IP: 192.168.0.208:50014                      Remote IP: 52.115.223.102:3478
Is Proxied Path: False                             Last Known Reflexive IP: 71.146.175.10:50014

2021-05-14 20:05:08          Loss Rate: 0          Latency: 28.2       Jitter: 148        Protocol: UDP
Local IP: 192.168.0.208:50014                      Remote IP: 52.115.223.102:3478
Is Proxied Path: False                             Last Known Reflexive IP: 71.146.175.10:50014

2021-05-14 20:05:15          Loss Rate: 0          Latency: 25.97      Jitter: 29         Protocol: UDP
Local IP: 192.168.0.208:50014                      Remote IP: 52.115.223.102:3478
Is Proxied Path: False                             Last Known Reflexive IP: 71.146.175.10:50014

Call Quality Check Has Finished
```

Figure 7-20. *Network Assessment Tool results*

The configuration file included in the installation folder of the Teams Network Assessment Tool can be modified to adjust the length of the media test. The default value is 300 seconds. The configuration filename is `NetworkAssessmentTool.exe.config`. The following setting controls the duration:

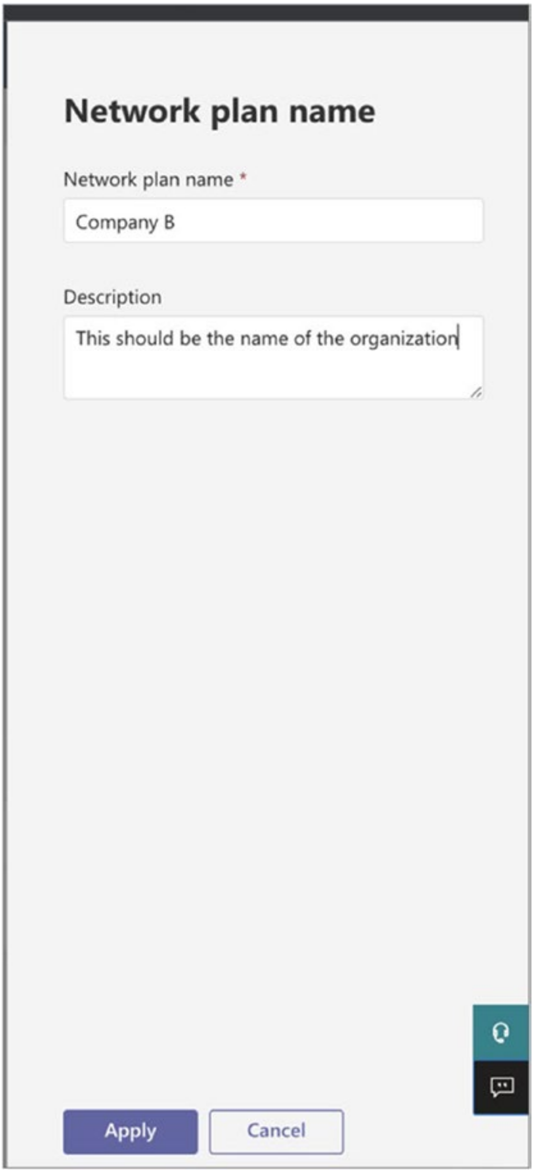
<add key="MediaDuration" value="300"/>

Change the value 300 to the desired test call duration length, save the file, and run the quality test. The quality test can be interrupted at any time by pressing Ctrl+C within the PowerShell window.

Network Planner

Network Planner is a new tool that is available in the Teams admin center. It can be found by going to Planning ➤ 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.

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. Refer to Figure 7-21 to see the Network Planner tool.



Network plan name

Network plan name *

Company B

Description

This should be the name of the organization

Figure 7-21. *Network Planner tool*

4. Click the plan name to select the new plan.

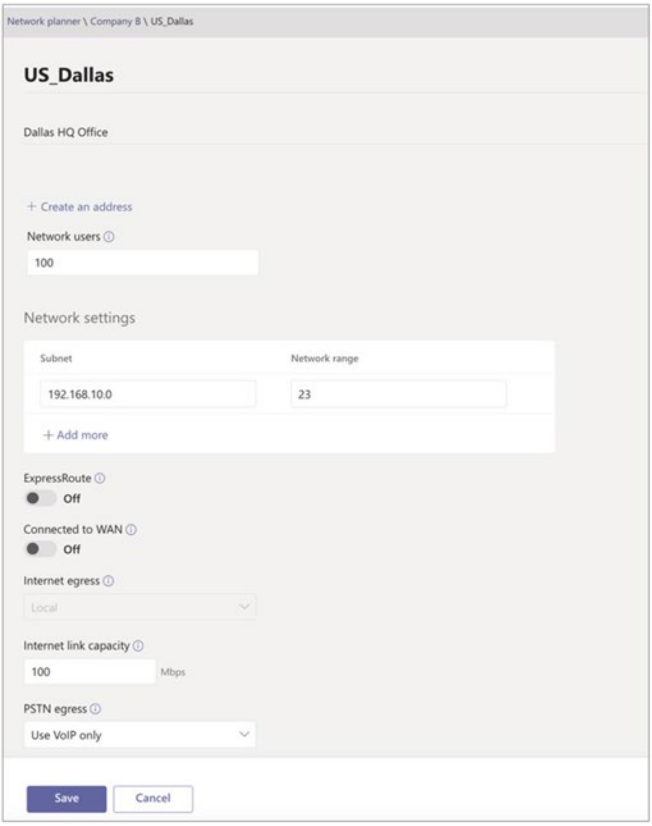
5. Add sites to create a representation of your organization's network setup. Depending on your organization's network, you may want to use sites to represent a building, an office location, or something else. Sites might be connected by a WAN to allow sharing of Internet and/or PSTN connections. For the best results, create sites with local connections before you create sites that remotely connect to the Internet or PSTN.

Here's how to create a site:

1. Add a name and description for your site.

2. Under Network settings, add the number of network users at that site (required).

3. Add network details: WAN-enabled, WAN capacity, internet egress (Local or Remote), and PSTN egress (none, local, or remote). You must add WAN and Internet capacity numbers to see specific bandwidth recommendations when you generate a report. Refer to Figure 7-22 to see the Network Planner configuration.



Network planner \ Company B \ US_Dallas

US_Dallas

Dallas HQ Office

+ Create an address

Network users ⓘ: 100

Network settings

Subnet	Network range
192.168.10.0	23

+ Add more

ExpressRoute ⓘ: Off

Connected to WAN ⓘ: Off

Internet egress ⓘ: Local

Internet link capacity ⓘ: 100 Mbps

PSTN egress ⓘ: Use VoIP only

Figure 7-22. *Network Planner Configure*

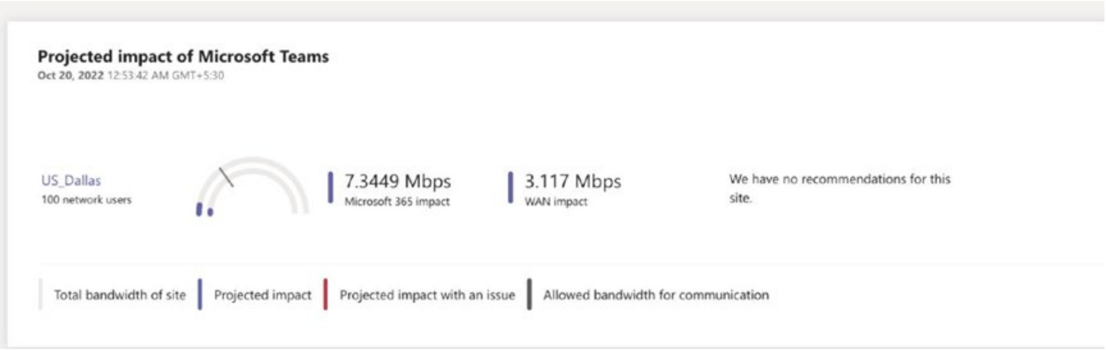
4. Click Save.

Here’s how to create a report:

1. After you add all sites, you can create a report, as follows.
2. On the Reports tab, click “Start a report.”
3. 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 percent office worker and 20 percent remote worker).

4. After you complete the distribution, click "Generate report."

5. The generated report will show the bandwidth requirements in several different views so that you can clearly understand the output. Refer to Figure 7-23 for the Teams projected bandwidth.



Projected impact of Microsoft Teams
Oct 20, 2022 12:53:42 AM GMT+5:30

US_Dallas
100 network users

7.3449 Mbps
Microsoft 365 impact

3.117 Mbps
WAN impact

We have no recommendations for this site.

Total bandwidth of site | Projected impact | Projected impact with an issue | Allowed bandwidth for communication

Figure 7-23. *Teams projected bandwidth*

6. A table with individual calculations will display bandwidth requirements for each permitted activity.

7. An additional view will show the overall bandwidth needs with recommendations.

8. Click Save. Your report will be available on the reports list for later viewing.

Office Connectivity Tool

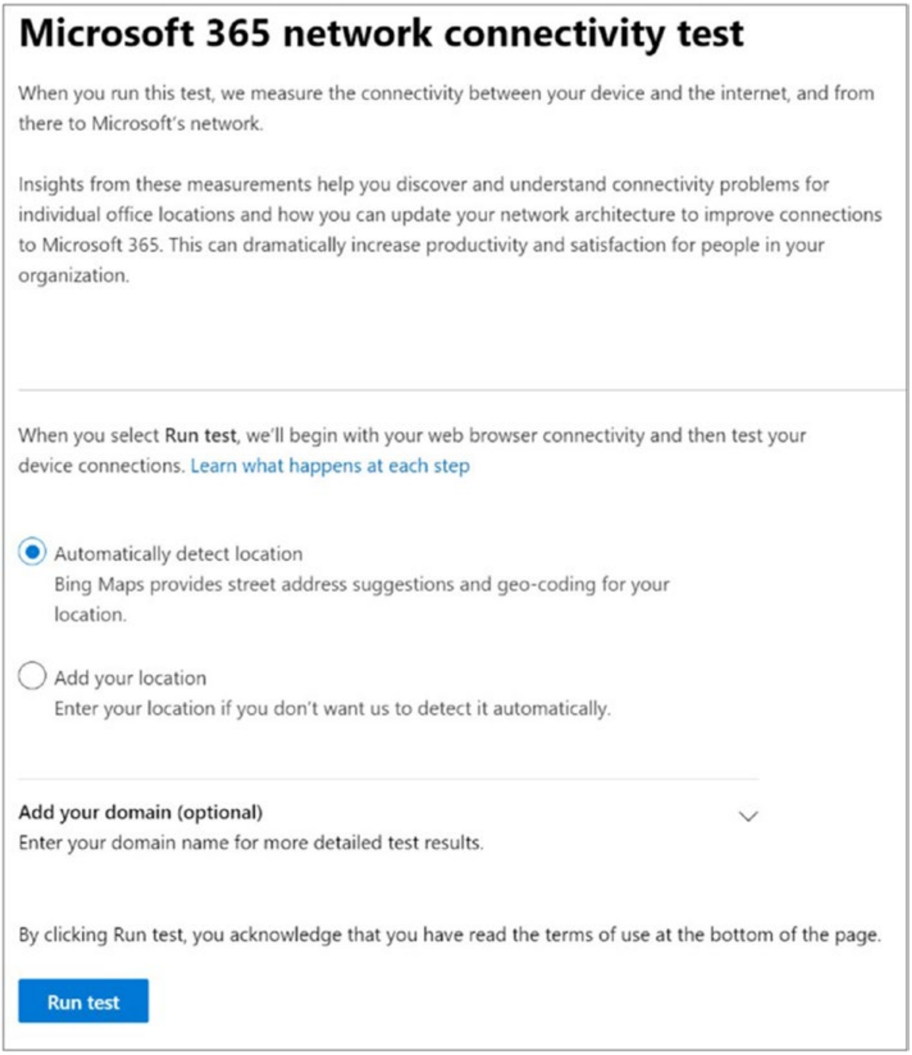
The Microsoft 365 admin center contains a network connectivity test tool as an adjunct to the insights and details available in the Health ➤ Connectivity section of the admin center. The Microsoft 365 network connectivity test tool is located at `https://connectivity.office.com`. Results from this tool can be collected in three different methods:

- Enabling Windows Location Services on Windows endpoints
- Adding locations and subnets manually into the tool
- Manually running tests through `https://connectivity.office.com`

For fewer office locations, it's recommended to run the test manually in multiple locations. To run the test manually, the following actions are required:

1. The user connects to `connectivity.office.com` and signs in by clicking "sign in" in the top-right corner of the page.

2. The user clicks the auto detect location or update the location manually. Refer to Figure 7-24 for Microsoft 365 network connectivity tests.



Microsoft 365 network connectivity test

When you run this test, we measure the connectivity between your device and the internet, and from there to Microsoft's network.

Insights from these measurements help you discover and understand connectivity problems for individual office locations and how you can update your network architecture to improve connections to Microsoft 365. This can dramatically increase productivity and satisfaction for people in your organization.

When you select **Run test**, we'll begin with your web browser connectivity and then test your device connections. Learn what happens at each step

● Automatically detect location
Bing Maps provides street address suggestions and geo-coding for your location.

○ Add your location
Enter your location if you don't want us to detect it automatically.

Add your domain (optional)
Enter your domain name for more detailed test results.

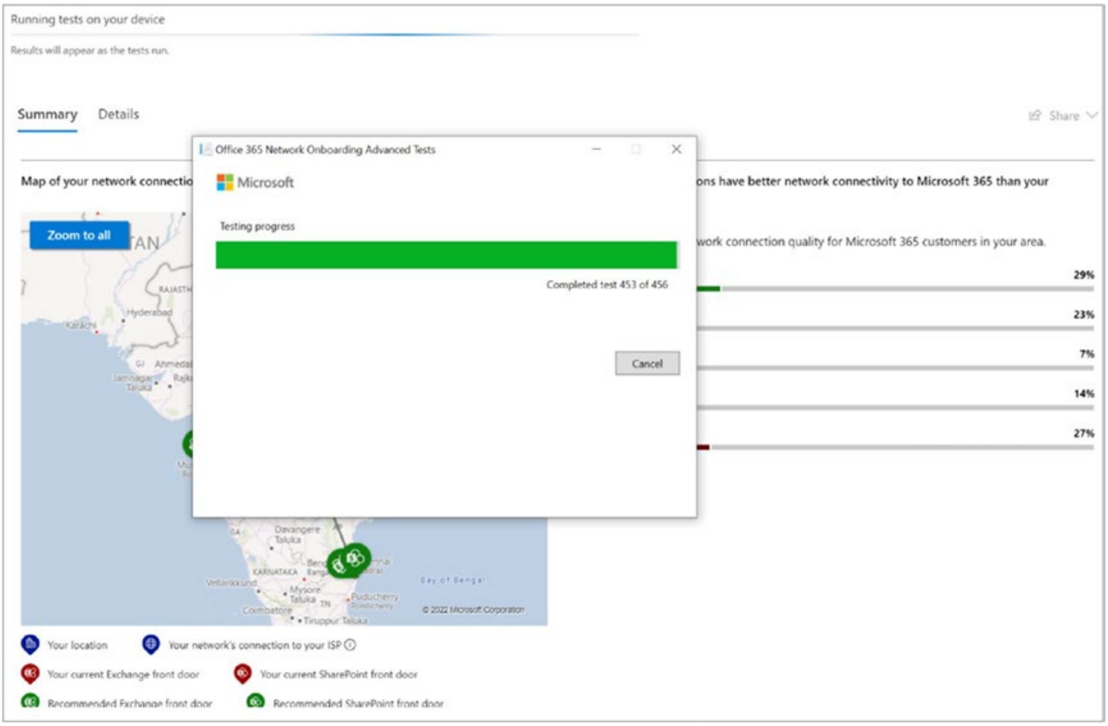
By clicking Run test, you acknowledge that you have read the terms of use at the bottom of the page.

Figure 7-24. *M365 network connectivity test*

3. When you click the "Run test" button, it shows the running test page and identifies the office location. You can type in your location by city, state, and country or choose to have it detected for you. If you detect the office location, the tool requests the latitude and longitude from the web browser and limits the accuracy to 300 meters by 300 meters.

4. The browser auto downloads an executable.

5. Click the executable and let it run. The client will run the Java test scripts in the back end and display the progress on client UI. The test runs for 5 to 10 minutes and displays a completed message on the UI. Refer to Figure 7-25, which shows the connectivity tests running.



Running tests on your device

Results will appear as the tests run.

Office 365 Network Onboarding Advanced Tests

Testing progress

Completed test 453 of 456

Map of your network connectio

ons have better network connectivity to Microsoft 365 than your

work connection quality for Microsoft 365 customers in your area.

29%

23%

7%

14%

27%

Your location

Your network's connection to your ISP

Your current Exchange front door

Your current SharePoint front door

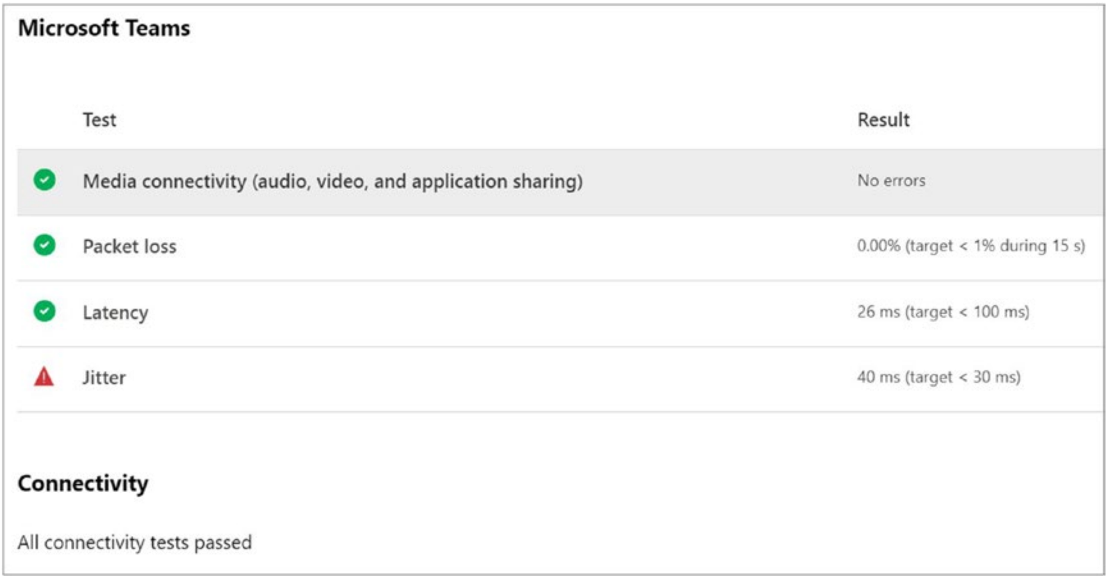
Recommended Exchange front door

Recommended SharePoint front door

Figure 7-25. *Connectivity test result*

6. Depending on the .NET version installed on the test machine, the client application throws an error to install the 6.0 or above .NET desktop app version app. Please ensure you have installed the desktop version (windowsdesktop-runtime-6.0.9-win-x64.exe) of the runtime from the download page.

7. Once the tests are completed, hit the close button, and come back to the browser. The test results are displayed in the browser. Click the details tab to ensure tests are completed successfully. Refer Figure 7-26 shows a successful test result.



Microsoft Teams

	Test	Result
✓	Media connectivity (audio, video, and application sharing)	No errors
✓	Packet loss	0.00% (target < 1% during 15 s)
✓	Latency	26 ms (target < 100 ms)
⚠	Jitter	40 ms (target < 30 ms)

Connectivity

All connectivity tests passed

Figure 7-26. *Test result*

8. Post validation, share the results by clicking the Share button. Share the results to the admin email address.

Network Optimization Methods

Here are the high-level recommendations to optimize the network for better connectivity and network performance:

- Provision local DNS servers in each location and ensure that Microsoft 365 connections egress to the Internet as close as possible to the user's location.
- If your corporate network has multiple locations but only one egress point, add regional egress points to enable users to connect to the closest Microsoft 365 entry point.
- Configure edge routers and firewalls to permit Microsoft 365 traffic without inspection.
- For VPN users, enable Microsoft 365 connections to connect directly from the user's network rather than over the VPN tunnel by implementing split tunneling.
- Migrate from traditional WAN to SD-WAN. Software defined wide area networks (SD-WANs) simplify WAN management and improve performance by replacing traditional WAN routers with virtual appliances, similar to the virtualization of compute resources using virtual machines (VMs).

SIP Tester

The SIP tester for Direct Routing is a PowerShell script tool that allows testing of Direct Routing SBC connections in Teams. Testing Direct Routing is quite complicated, but using the SIP tester tool makes it easier. This tool allows us to test the basic functionality of a customer-paired Session Initiation Protocol (SIP) trunk with Direct Routing, such as outbound and inbound calls, simultaneous ring, media escalation, and consultative transfer.

This SIP tester tool provides the ability to test real accounts in a Teams organization's indirect routing scenarios. Microsoft has written a web service that tests the Teams client login against one configured with SBC Direct Routing. You can automate this PowerShell script to make daily calls and checks to determine if SBC is working correctly.

To download the SIP tester tool, visit the Microsoft site at https://docs.microsoft.com/en-us/microsoftteams/sip-tester-powershell-script.

You can read further documents that come along with a script to understand the requirement to create test users, which will be used for basic call testing scenarios.

Refer to my blog at https://bloguc.com for more Teams client service troubleshooting information and best practice guidance.

Troubleshooting IM and Presence

Presence is an important feature of a user's profile in Microsoft Teams, which is also available across Microsoft 365 or Office 365. It helps other users to know about the user's current availability and status. By default, users within your organization using Teams can see if other users are available online in almost real time. However, sometimes users may face issues with the presence feature, such as Outlook and Teams presence not syncing, presence not updating correctly, or showing as unknown. Most of these issues can be resolved by updating the Microsoft Teams clients.

Presence sync is dependent on where a user's mailbox is hosted. If the user's mailbox is hosted online, then the presence gets synced seamlessly. However, if a user has a mailbox hosted on-premises, there may be a delay of up to an hour in the presence syncing. Microsoft offers a self-diagnostic tool to validate the user's presence status. Administrators can enter the username or email address of user-facing issues and run tests. The diagnostic tool is available through this link:

https://admin.microsoft.com/AdminPortal/?searchSolutions=Diag%3A%20Teams%20Presence#/homepage.

Users may face difficulty in identifying the presence of other users on Microsoft Teams. In such cases, it may appear that the user is offline, which usually happens when the user sets their presence status to "Appear offline" or if there is a network communication issue. If this issue occurs frequently, as an administrator, it is recommended to verify if the contact is active on Microsoft Teams and Azure AD/AD and to ensure that the user has network connectivity to the Microsoft endpoints. If you are unable to determine the issue, it is advised to raise a support ticket with Microsoft.

Finally, during the scenarios of co-existence, based on the user's co-existence mode, presence will vary as follows:

- If a user is in TeamsOnly mode, then any other user (whether in Teams or Skype for Business) will see that TeamsOnly user's Teams presence.
- If a user is in any of the Skype for Business modes (SfbOnly, SfbWithTeamsCollab, SfbWithTeamsCollabAndMeetings), then any other user (whether in Teams or Skype for Business) will see that Skype for Business user's Skype for Business presence.
- When a user is in island mode, their presence in Teams and presence in Skype for Business can be different from each other, and it's perfectly normal. Other users will see either the Teams or Skype for Business presence of the island user, depending on whether they are in the same tenant or in a federated tenant and which client they use.
- Within the same tenant, a Teams user can see the presence of an island user.
- When a user in a federated tenant views the island user's presence in Teams, they will see their Skype for Business presence.
- From Skype for Business, any other user will see the island user's Skype for Business presence (both in-tenant and federated).

Troubleshooting Chat Issues in Microsoft Teams

Users of Microsoft Teams may occasionally experience issues related to the chat feature. Common problems include the disappearance of the chat icon from the navigation pane or the inability to access the chat during a meeting. Here we outline the typical causes of these issues and what to check to resolve them.

Missing Chat Icon in Navigation Rail

One frequent issue is that the chat icon goes missing from the left-hand navigation rail. If this happens, there are several things to consider:

- **Messaging policy:** Ensure that the chat functionality isn't disabled in your organization's Teams messaging policy. If chat is allowed, the icon should normally be visible.
- **User actions:** Users might have unintentionally "unpinned" the chat app from the navigation rail. It's a good idea to verify whether this is the case and, if so, re-pin the chat application.

Meeting Chat Access Issues

Another common problem is that some users can't access the chat during a Teams meeting. This can happen for various reasons:

- **Administrator settings:** The meeting chat could be disabled by the system administrator through a specific meeting policy. This setting can be verified and updated by the administrator as needed.
- **Meeting organizer control:** Sometimes, the meeting organizer might have altered the default meeting options, affecting chat accessibility.
- **High attendee count:** If a user joins a meeting with more than 1,000 participants, they might face limitations on accessing the chat feature.
- **External users and forwarded links:** It's worth noting that external participants and those who join through a forwarded meeting link might also have restricted chat access.

By identifying the root cause of these chat-related issues, users and administrators can take appropriate actions to rectify them, ensuring a more seamless communication experience within Microsoft Teams.

Summary

Microsoft Teams serves as a comprehensive solution for unified communications and collaboration. However, like any sophisticated platform, it is not entirely immune to issues. This chapter provides an in-depth guide to various approaches for effective troubleshooting of Microsoft Teams, ensuring a seamless experience for end users.

One of the fundamental steps in avoiding common Teams problems is to adequately prepare your network environment. This includes configuring your corporate firewall to allow Teams services, IP addresses, ports and protocols, URLs, and FQDNs. Such preparedness ensures that each feature within Teams operates as expected.

This chapter emphasized the importance of employing the right set of tools for diagnostics and troubleshooting:

- **Call Analytics:** This tool offers detailed information on call history, providing deep insights into individual call records. It is especially useful for identifying issues related to call quality.
- **Call Quality Dashboard (CQD):** The CQD provides a broader view by allowing you to analyze call data in aggregate. It is invaluable for spotting trends and systemic issues within your organization's Teams usage.
- **Network Assessment Tool:** This is an essential tool for evaluating your network's capacity to handle Teams traffic, particularly focusing on audio and video quality.

Collecting diagnostic information from Teams clients can offer insights into common problems that users may face. These could range from chat-related issues to audio-video quality problems in calls and meetings. Understanding how to collect this information is key to quick and effective problem resolution.

Not all troubleshooting tools are suited for every problem. Knowing which tool to use in specific scenarios is crucial for efficient problem-solving. For example, while Call Analytics might be perfect for diagnosing issues on an individual level, CQD could be better suited for a holistic organizational assessment.

Understanding the intricacies of Microsoft Teams and knowing how to wield its troubleshooting tools are essential skills for administrators and IT professionals. Whether you're trying to get ahead of issues by setting up your network correctly or dealing with user-reported problems, the strategies and tools discussed in this chapter will equip you with the knowledge you need for effective troubleshooting.