

# Troubleshooting Webex Meetings and Calls

Technical Paper

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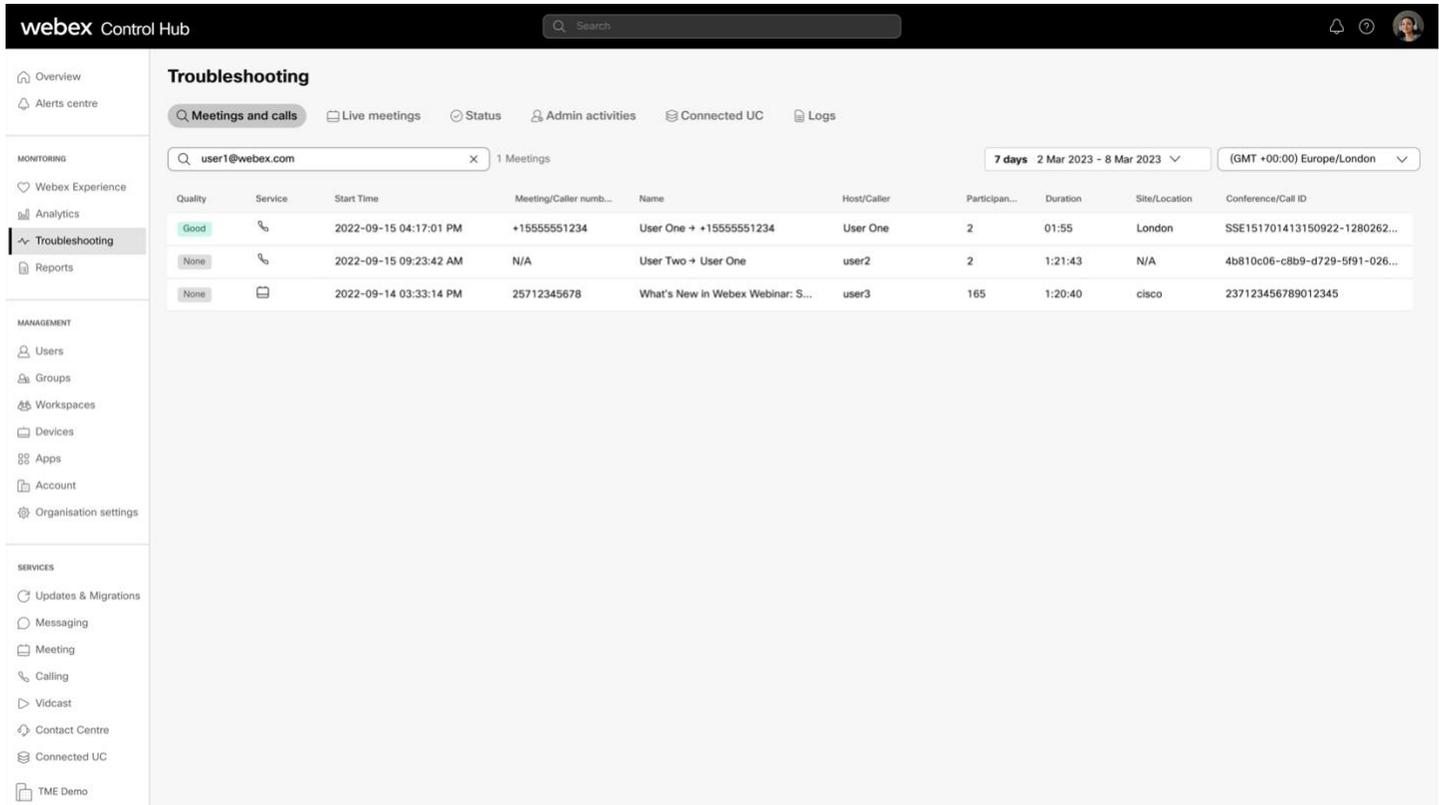


To have a good experience during a Webex Meeting or call, you must have good video and/or audio quality. Media quality can be degraded by several factors including the environment, equipment, or the network. This document highlights key considerations when troubleshooting poor meeting or calling experiences and outlines the tools available for you to help resolve them.

## Getting Started with the Control Hub Troubleshooting Interface

To make the following sections easier to understand, this section introduces the Control Hub troubleshooting interface.

Troubleshooting a meeting or call in Control Hub is simple. First, navigate to Troubleshooting > Meetings & Calls and then search for a user's email address, meeting number, Conference ID, phone number, device name or MAC address. As shown in Figure 1, a list of meetings and calls up to 21 days in the past are available to view as well as any Webex Meetings or Calls on Webex in progress.



**Figure 1**  
Search for meetings and calls

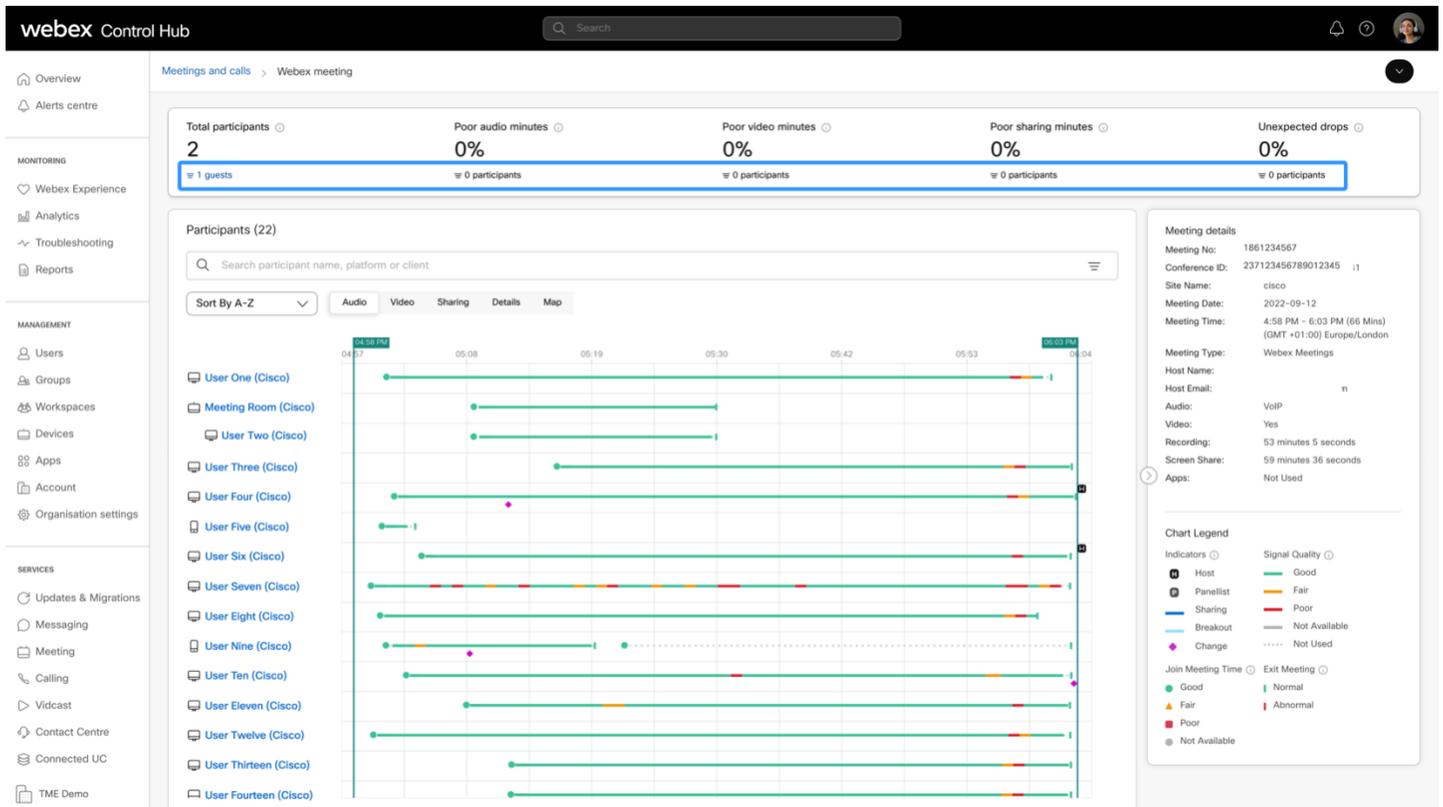
Three types of record can be found, Webex Meeting, Webex Calling and Call on Webex (Call on Webex is 1:1, non-PSTN calling). These can be identified by the icon under Service, the Webex Calling calls are graded for quality. However, for the Webex Meetings or Call on Webex sessions, this grading will show as None. The call experience is graded as:

- Poor: indicates that either the caller or callee had a poor end-to-end experience (for example, choppy audio).
- Good: indicates the end-to-end experience for the caller and callee did not exceed thresholds.
- None: applies to Webex Meetings or Call on Webex sessions.

In all troubleshooting cases, after clicking on a Meeting or Call, in the top right corner there is a button available that allows you to export a Comma Separated Variable (CSV) file containing participant details and a JSON file with raw data for further analysis.

## Meeting Troubleshooting in Control Hub

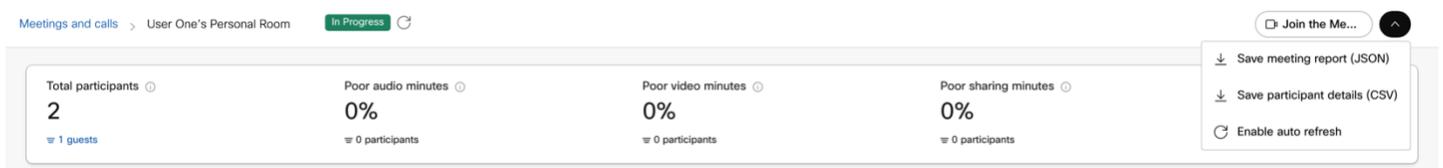
Clicking a meeting (Figure 2) shows an overview with Key Performance Indicators across the top (click the blue fields to filter participants – highlighted with a blue box), participant information in the main pane, including audio receive experience, video receive experience, share experience, details of equipment and networks, a map showing join information, and finally, meeting details on the right.



**Figure 2**  
Meeting Overview

It is also possible to monitor Webex Meetings that are in progress. In this case a refresh icon is available at the top of the page (Figure 3) that will update the information shown. It is also possible to set the page to auto refresh by selecting the option from the top right hand corner button.

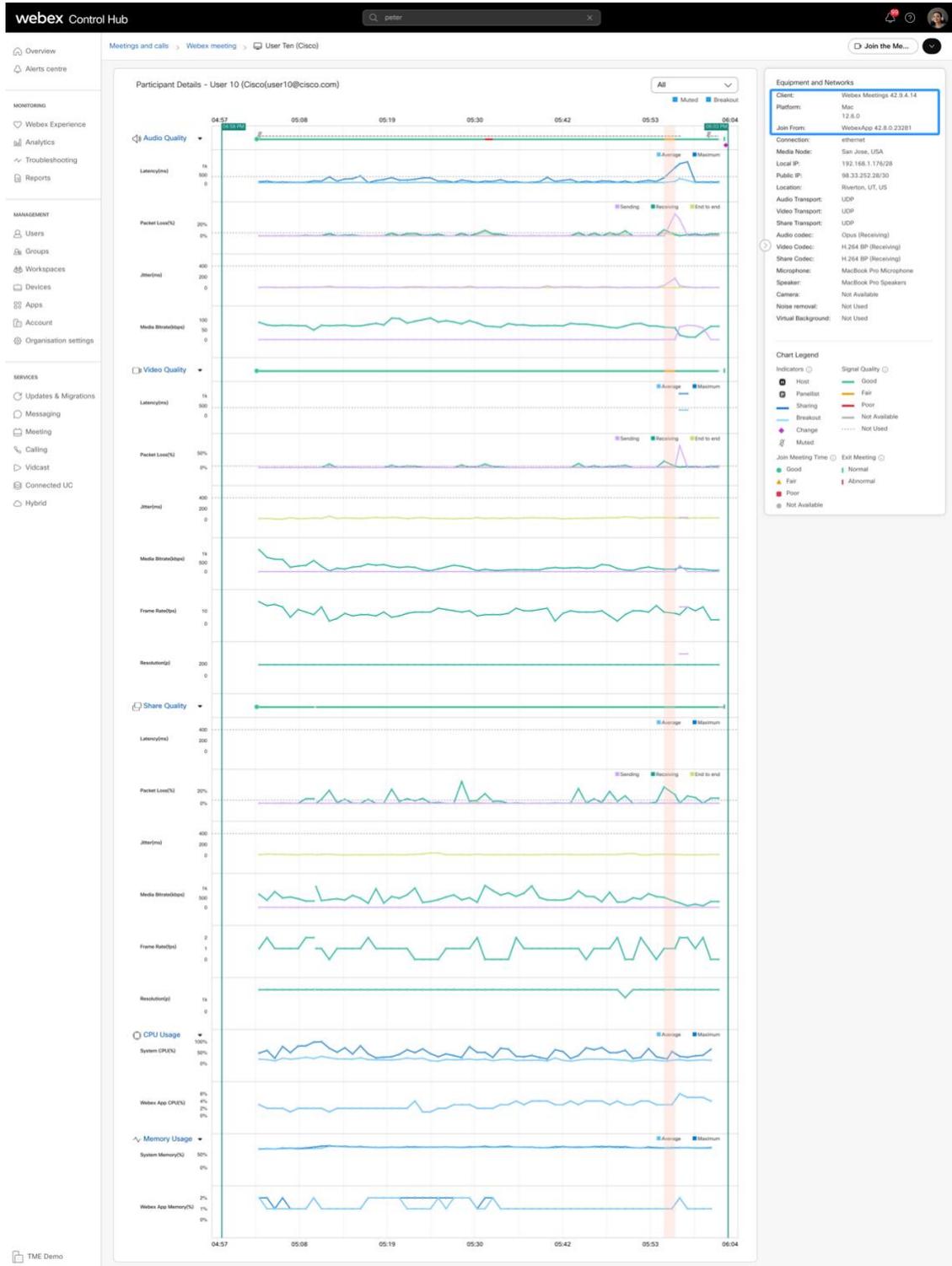
If an administrator has the Advanced Troubleshooting Access role assigned, they will also see a **Join the Meeting** button (Figure 3). This allows the administrator to join the meeting to help with any troubleshooting. If the meeting has restrictions such as a PIN or meeting lock, the administrator will be subject to these limitations as normal, the meeting host will need to allow the administrator to access the meeting.



**Figure 3**  
Refresh and Join Meeting

Clicking a participant (Figure 4) shows details of that user's meeting experience in the main pane including Audio, Video and Share quality. Measurements of latency, jitter, bitrate, and packet loss are shown. Measurements consider send and/or receive and packet loss also considers end-to-end. Send is from the local participant to Webex node, receive is from the Webex node to the local participant and end-to-end is the receive from far end participant, via Webex node(s), to the local participant. Where the Webex App is used, CPU

and memory usage is also reported for the Webex App and device running the Webex App. Graphs can be filtered by clicking on the legend names above the charts (e.g. click **Sending** to hide the sending graph on the page).



**Figure 4**  
Meeting Participant Details

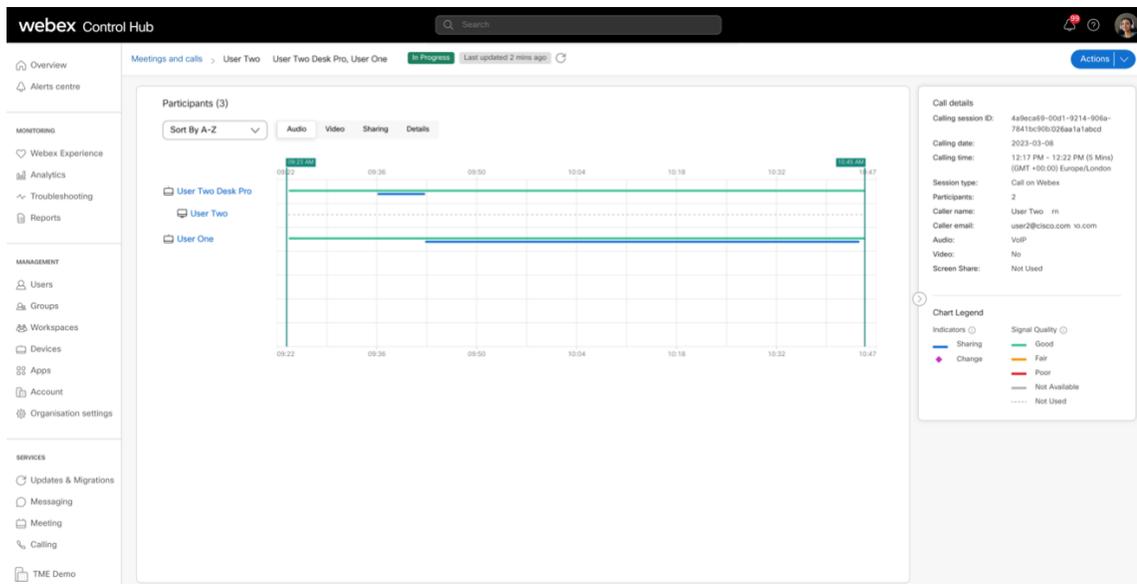
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As highlighted in Figure 4, a participant who joins using the Webex App can be identified using the **Joined From** field, the **Client** field may report as “Webex Meetings”, this typically matches the meetings site version.

Not all details are reported by every participant type, for a full matrix see the **Advanced Diagnostics and Troubleshooting in Control Hub** article on help.webex.com <https://help.webex.com/en-US/article/ni3wlvw/Advanced-Diagnostics-and-Troubleshooting-in-Control-Hub>

## Call on Webex Troubleshooting in Control Hub

Clicking a Call on Webex (Figure 5) shows an overview with participant information in the main pane, including audio receive experience, video receive experience, share experience, details of equipment and networks, and finally, call details on the right. Where a user has paired with a Cisco device, this pairing relationship is shown with the user indented beneath the device they used to make the call.



**Figure 5**  
Call on Webex Overview

Clicking a participant (Figure 6) provides a similar experience to the meeting view, it shows details of that user’s call experience in the main pane including Audio, Video and Share quality.

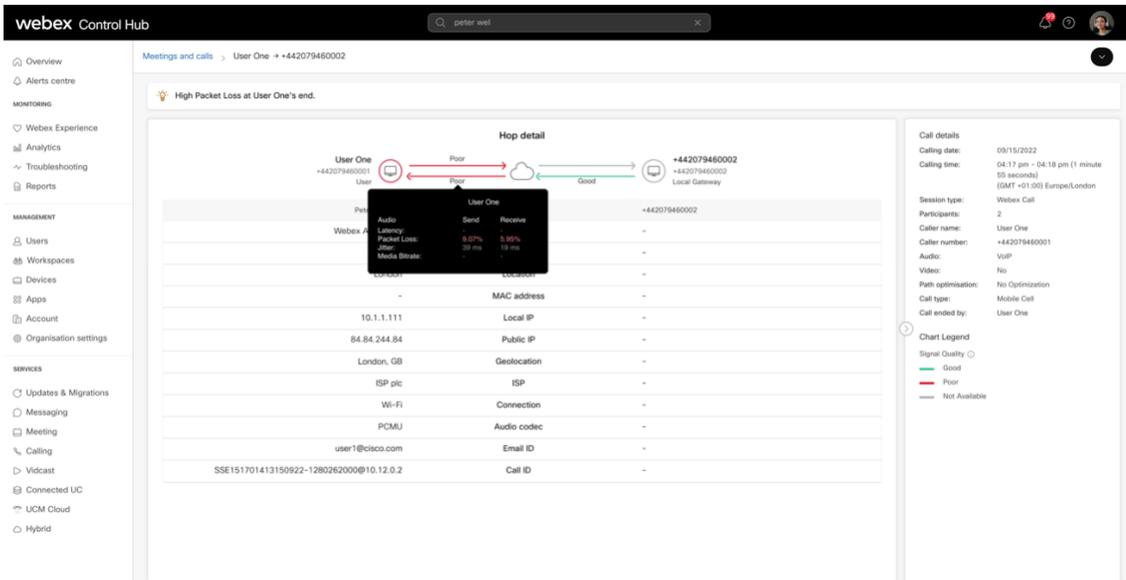


**Figure 6**  
Call Participant Details

# Webex Calling Troubleshooting in Control Hub

Clicking a Webex Call (Figure 7) shows an overview with participant information in the main pane that allows administrators to:

- View the end-to-end experience of the participants of the call.
- View hop detail of the call.
- View if the media traverses through the Webex Calling cloud, or directly between the users (using Interactive Connectivity Establishment (ICE)).
- Analyze the call quality metrics that impacted the experience of the user. For example, an administrator may observe high jitter on clients that are connected to Wi-Fi networks, but packet loss and latency may be acceptable.
- Detect if the issue is with the caller or the callee.



**Figure 7**

Webex Call Overview

From the Hop details, you can:

- Hover on the device to view the end-to-end call experience.
- Hover on the hop between the endpoint and Webex Calling cloud to view the hop details.

The end-to-end call experience is based on the media quality data that is collected from each Webex Calling registered endpoint (Webex App, Webex Calling App, Webex Calling Device such as 8865) at the end of the call (Webex Calls will only appear in Control Hub once they have ended).

# Understanding Webex Meeting and Call on Webex Quality Measurements

**Latency** describes how long packets take to travel to and from the participant, a common effect of high latency is a delay between people saying something and it being heard. This often results in pauses where participants wait to hear what the other is going to say and then both parties speaking over each other, as the long pause suggests to both participants that they should be speaking. The most common cause of high latency is long distances between participants, however excessive latency e.g. over 300ms is likely to be caused by underlying network or device issues. It should be noted that if a participant is using a VPN, it is important to consider where that VPN is connected as well as the geographical location of the participants as this can add distance to the network connection.

**Packet Loss** measures how many packets did not make it to their destination. Packet loss can cause clipping of audio, for instance missing the sound of the first letter in a word or in some instances garbled audio. Video streams can experience a wide variety of effects including, pixelation, smearing, image retention and freezing. Three types of packet loss are considered. **Sending** measures packets from the participant to the Webex node. **Receiving** measures packets from the Webex node to the participant. **End-to-end** measures packets from the far end participant, via Webex, to the local participant. **End-to-End packet loss** is measured after packet loss concealment has taken place, therefore the receive packet loss may be considerably higher than the end-to-end packet loss reading suggests.

Figure 11 shows two spikes in end-to-end packet loss, these are indicated by corresponding red areas in the audio quality bar. Since the receive packet loss does not spike at this time, it can be deduced that the local participant's connection to Webex is not the cause of the packet loss.

**Jitter** measures the variability of latency measurements. High jitter can effectively cause latency and in extreme cases packet loss. This is because jitter is mitigated by using a jitter buffer that waits for out of order packets to arrive (inducing some latency), if a packet arrives out of order and beyond the size of any jitter buffer, it will be dropped (resulting in packet loss).

**Media Bitrate** shows how much bandwidth is being used by the **sending** and **receiving** media streams.

**Frame rate(fps)** shows how many frames per second are being **received** and **sent** by the participant. In general, a framerate of 30fps is targeted. Note that in certain circumstances this framerate will not be reached, for example when using background replace on the Cisco Desk Pro, the device will send a maximum of 25fps.

**Resolution(p)** shows the highest resolution stream that the participant is **sending** and **receiving**. Note as mentioned later, a participant may be receiving a low resolution due to the local layout that is selected.

**Audio/Video Quality** bars show the receive audio/video quality for the participant, the color of this bar is decided by end-to-end packet loss (from the speaking far end participant, via the Webex node(s), to the local participant) and latency – whichever is worse. Table 1 details the thresholds for each quality level.

Table 1. Quality Thresholds

QUALITY	LATENCY	PACKET LOSS
Good (Green)	< 300ms	< 3%
Fair (Orange)	300ms < 400ms	3% < 5%
Poor (Red)	> 400ms	> 5%

## Understanding Communication Protocols

While use of the User Datagram Protocol (UDP) is preferred by Cisco Devices and the Webex App for Webex Meetings and Calls on Webex, on occasion it is not used for audio and/or video IP packets. This is most often caused by UDP ports 9000 and/or 5004 being blocked by a firewall or similar device. When the Webex App or a Cisco Device is unable to communicate with the Webex cloud using UDP, it will try to use Transmission Control Protocol (TCP) as a fallback mechanism. However, using TCP for collaboration media is not ideal, so audio and video quality may be degraded if it is used. To read more about port usage refer to this article:

<https://help.webex.com/WBX000028782/Network-Requirements-for-Webex-Services>.

Control Hub reports the protocol used by each participant in a Webex Meeting or Call on Webex. This can be found in the Webex Meeting or Call on Webex Overview **Details** tab, or in the **Participant Details** Equipment and Networks pane. In Figure 8, the Equipment and Networks pane from the **Participant Details** page is shown. In the case of this participant, UDP is being used for all media. It is also possible to get an overview of UDP port usage by using Control Hub Analytics, see Figure 20.

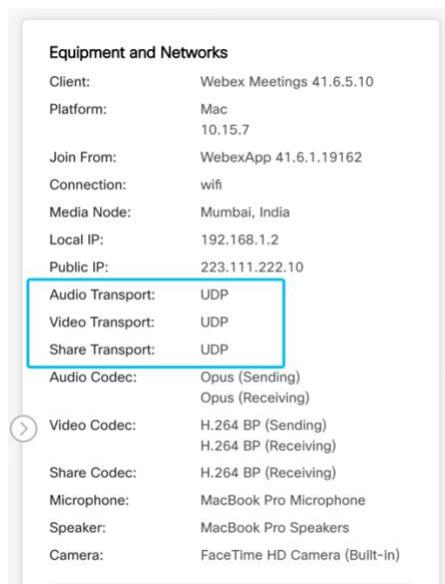


Figure 8

Equipment and Networks: Transport

# Troubleshooting Webex Meeting and Call on Webex Audio Quality

Audio is the most important part of the meeting experience. Several factors can affect a participant's audio quality, including their join method and connection type, hardware, and the surrounding environment. In this section, you will learn more about these factors and how they can affect audio quality.

## Join Method

The Webex App offers several audio options for Webex Meetings depending on which audio solutions are licensed and configured. A participant can select what type of audio they want to use when they join a Webex Meeting or change it during the meeting. Each of the join methods will use either VoIP or the PSTN (Public Switched Telephone Network) for connecting the user to Webex. Table 2 has an overview of the methods available.

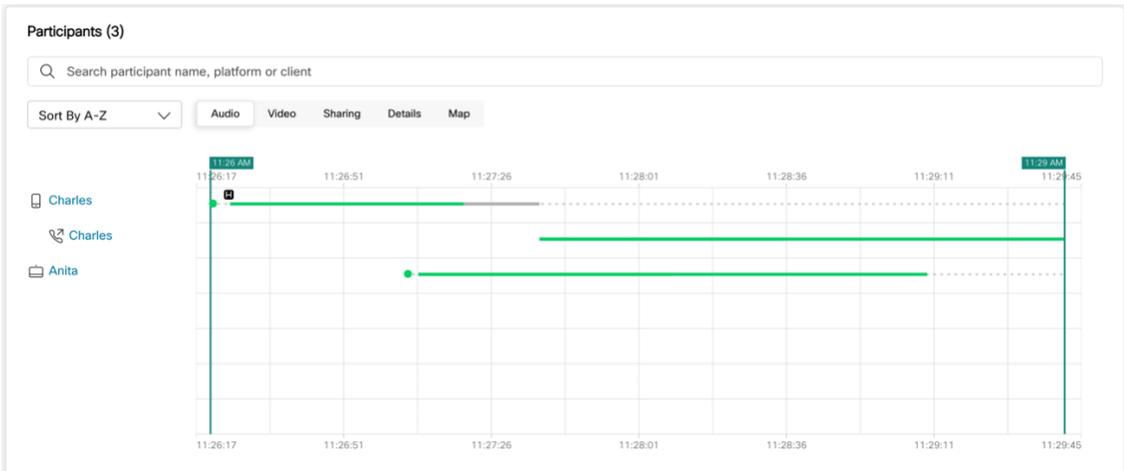
Table 2. Overview of Webex Meeting Join Methods

WEBEX JOIN METHOD	CONNECTION TYPE
Device Audio – Use the device speaker, microphone and network connection for audio.	VoIP
Call Back – Allows the participant to enter a phone number for the Webex service to call them.	PSTN
Call In – Participant calls in to Webex from a phone and can connect to the conference.	PSTN

When **Call Back** or **Call In** are used to join a Webex meeting, the connection between the participant's device and Webex occurs through a third party PSTN provider in most cases. This provider often uses VoIP internally but there is little to no visibility of the PSTN provider's network and the audio connection that is traversing it. This makes troubleshooting any audio quality issues more difficult when using **Call Back** or **Call In**.

## Audio Connection Quality Analysis

Control Hub shows when a separate PSTN connection is used for audio in a meeting. In Figure 9, Charles used PSTN, while Anita used VoIP.



**Figure 9**  
Call In participant and device participant

The first icon shows Charles connected using the Webex App on a mobile device. Audio was connected via VoIP initially and then Charles switched to using a **Call In** PSTN connection, as shown by the second icon, which is indented to show to whom it belongs. If a **Call Back** connection was made, the arrow next to the phone icon would be in the reverse direction.

The IP connection between Charles’s Webex App and Webex stays connected for management and device communications and other services like video or screen sharing. If video is enabled for a PSTN user, it will flow to their Webex App over their Internet connection.

Clicking on the **Call In** connection for the participant shows more details about the PSTN connection as shown in Figure 10.



**Figure 10**  
Audio Quality Details for a PSTN Participant

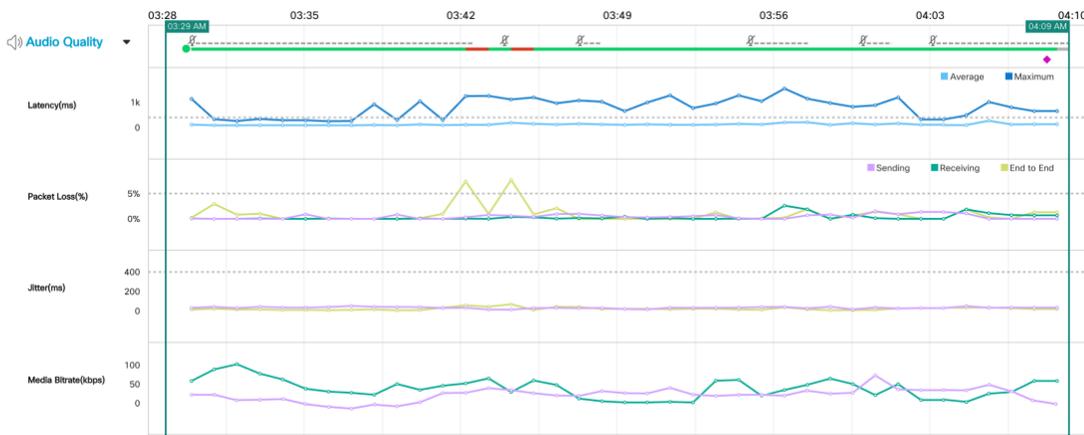
The troubleshooting information available for a join method using a PSTN provider is quite limited. You can get a general sense of the audio quality experienced through the MOS (Mean Opinion Score). However, the MOS value supplies no details about what may be causing a low score. See Table 3 for MOS quality thresholds.

Table 3. MOS Quality

QUALITY	MOS
Good (Green)	$4.0 \leq 5.0$
Fair (Orange)	$3.0 \leq 3.9$
Poor (Red)	$< 3.9$

It is important to remember that PSTN only supports a limited range of frequencies, therefore audio quality will never be as good as using a VoIP connection.

Anita joined using a Cisco Room device. In this case, a VoIP stream is created between Anita’s device and the Webex media node. This is the same as using a VoIP connection with the Webex App. Because of this direct connection to Webex, Control Hub offers more insight into the audio stream. In Figure 11, you can view the audio details for Anita.



**Figure 11**  
Audio Quality Details for an Audio Participant Using VoIP

Webex uses impairment concealment technologies to reduce the impact of bad network conditions on quality. End-to-end packet loss measurements are shown after concealment has taken place, therefore quality bars are shown after concealment has taken place.

While a user’s audio quality may rate as good, it is important to consider what their send and receive measurements show too. It may be that the user is enjoying a good experience because packet loss concealment is hiding underlying network or device problems, these problems should still be addressed.

## Troubleshooting Webex Calling Quality

There are five types of media experiences or paths for Webex Calling troubleshooting, which are:

- On-net Optimized

- On-net Unoptimized
- On-net Cloud Hosted
- Off-net Call to or from the Webex Calling registered endpoint -
  - via Cloud Connected PSTN Provider
  - via Local Gateway

To understand these call flows in more detail see this help article: <https://help.webex.com/en-us/article/frj1efb/Troubleshoot-Webex-Calling-Media-Quality-in-Control-Hub>

Hop quality is graded as good if it satisfies these thresholds.

- Packet loss less than 2.5%.
- Latency or RTT less than 200 ms.
- Jitter less than 75 ms.

End to End quality is graded as good if it satisfies these thresholds:

- Packet loss less than 5%.
- Latency or RTT less than 400 ms.
- Jitter less than 150 ms.

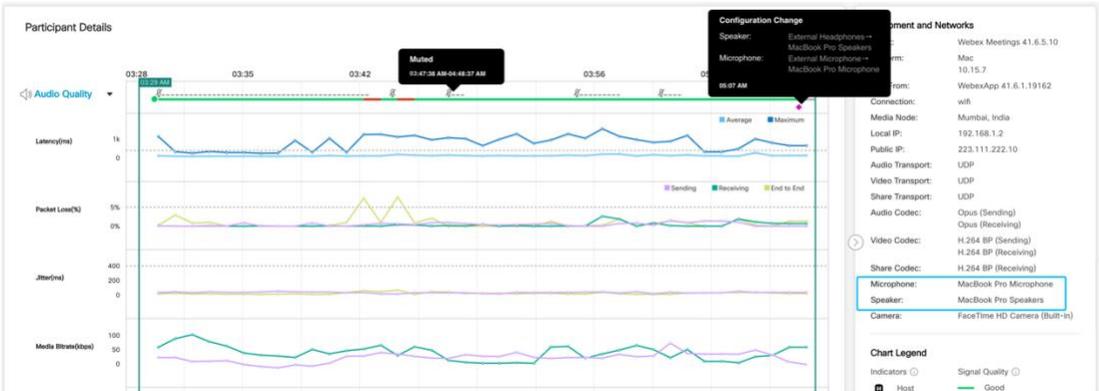
## Audio Hardware

The hardware that is used to send and receive audio can have a substantial effect on the quality participants experience. Cisco Devices ensure a high-quality experience from the desktop to the boardroom, with microphones and speakers optimized for voice, offering a consistent experience for users to enjoy their meetings.

When using the Webex App, it is important to consider audio hardware. An excellent choice is to use a premium headset such as the Cisco Headset 730. This ensures that a high-quality microphone and speaker is being used (in the case of the Cisco Headset 730, background noise removal is built in). An alternative is to use a broadcast quality standalone microphone designed for streaming and recording.

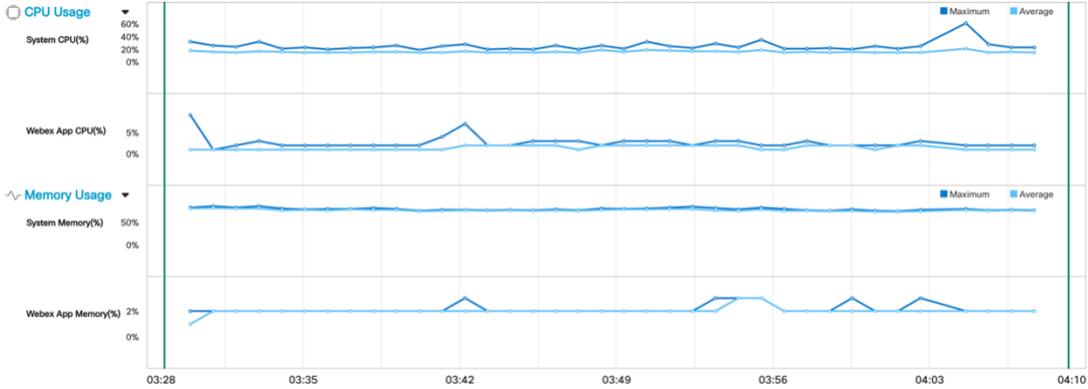
Using built-in laptop speakers and microphones is not ideal. The nature of a laptop microphone is that it must be flexible with its pickup range and that makes background noise a problem. In certain circumstances, echo may also be experienced, caused by feedback from the laptop speakers to the laptop microphone.

Control Hub reports the microphone and speakers used by each participant in a Webex Meeting or Call on Webex, this can be found in the Overview Details tab or in the Participant Details Equipment and Networks pane. In Figure 12, the Equipment and Networks pane from the Meeting **Participant Details** page is shown. Microphone mute status is also shown, allowing confirmation that any complaints of no audio being heard were not caused by accidental microphone muting. In addition, any changes to the speaker or microphone hardware are reported, highlighted in the main pane by a pink diamond.



**Figure 12**  
Audio Hardware Participant Details

Additionally, PCs, Macs and mobile devices can have resource constraints, as the CPU and memory must be shared with other applications. This can result in packets not being processed promptly, which can cause poor audio quality. Certain applications are particularly resource intensive, for instance any kind of video editing software, participants should be wary of multitasking with such applications. The **Participant Details** show CPU and Memory usage for the Webex App and system, as shown in Figure 13.



**Figure 13**  
CPU and Memory Usage

# Audio Environment

The environment where participants join from will affect the quality of the audio sent to the far end. The three primary acoustic factors for the audio experience are:

- Reverberation in the room
- Noise levels (background noise)
- Sound insulation between the room and the surrounding environment

To learn more about these factors and how to optimize a room acoustically, please refer to the **Best Practices for Creating Effective video-enabled Rooms** which can be found here: <https://projectworkplace.cisco.com/learn>. While this document is focused on deployment of Cisco Devices, the information is as valid for a Webex App running on a laptop in a home office.

While some treatments will not be possible at home, simple things like using a rug in a room with wooden floors can have a positive effect on acoustics. In the case of a non-optimal acoustic environment, Cisco Devices and apps have built in noise removal technology that can mask unwanted noise that a microphone is picking up. If there are other people nearby, talking in the background, it is also possible to remove unwanted speech by selecting the option that optimizes for your voice. <https://help.webex.com/en-US/article/b3kqr9/Optimize-Your-Meetings-and-Events-for-Your-Voice>

In general, it is good practice for participants to mute themselves when they do not speak. This not only prevents any unwanted noises affecting the meeting, but also protects the participants privacy, for instance, in case they forget they are unmuted and begin a side conversation. It is possible to configure the Webex App to mute the microphone automatically when joining a meeting.

## Troubleshooting Webex Meeting and Call on Webex Video Quality

While audio is the most important part of the meeting experience, video greatly enhances it. Meetings that use video are more engaging, creating a more natural expression of thought and feeling through body language and facial expressions, allowing participants to visualize the impact of their words and conversation.

### Video Connection Quality Analysis

Video resolution and frame rate are two key parameters that define video quality. Video resolution specifies the number of pixels in the horizontal direction (width) by the number of pixels in the vertical direction (height) captured in each video frame. Resolutions in Control Hub are reported using the pixel height, e.g., 720p or 1080p.

Frame rate specifies how many video frames are seen per second. Higher frame rates are particularly useful when there is frequent motion in the given scene. Typically, the primary video stream in a Webex meeting, that shows participants, is sent at a higher frame rate e.g., 30fps. The secondary video stream used for content sharing is typically sent at lower frame rates, but can be optimized for motion and video see

<https://help.webex.com/en-us/article/nkjr19eb/Share-motion-and-video-content-in-Webex-Meetings-and-Webex-Webinars> , in which case 30fps will be targeted.

The [Bandwidth Provisioning and Capacity Planning](#) section of the Preferred Architecture for Cisco Webex Hybrid Services, Cisco Validated Design document supplies typical and largest video bandwidth requirements for Cisco devices and applications.

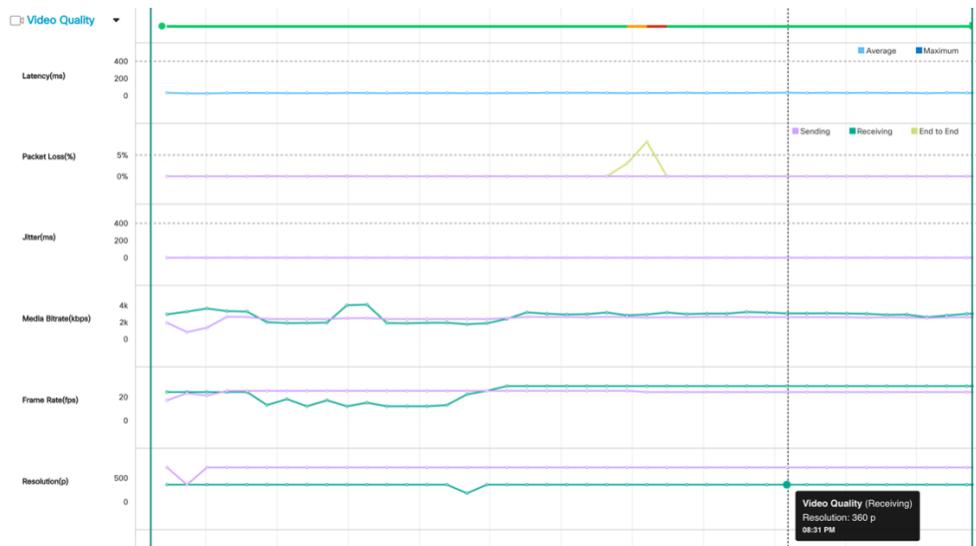
Webex uses separate streams of video for each participant, so usually a Webex App or Cisco Device will receive multiple video streams, one for each participant they can see. The video resolution of each received video stream is decided first by the far end participant (for example if the far end has limited bandwidth, they may send a lower resolution) and second by the video layout chosen by the local participant.

For instance, as seen in Figure 14, when viewing a grid layout, each participant can be a low resolution, as when the frame is composited together, the viewed frame would still be HD. Similarly, if content sharing is used, the content would take up most of the screen, participants would be shown much smaller and therefore they would not use a high resolution. This method ensures the best use of compute and bandwidth resource usage while keeping a high-quality experience for end users.



**Figure 14**  
Video Resolution and Layout

Control Hub offers insights into the main video stream sent to the participant and received by the participant, as shown in Figure 15.



**Figure 15**  
Video Quality Details

Webex uses impairment concealment technologies to reduce the impact of bad network conditions on quality. End-to-end-packet loss measurements are shown after concealment has taken place, therefore quality bars are shown after concealment has taken place.

While a user's video quality may rate as good, it is important to consider what their send and receive measurements show too. It may be that the user is enjoying a good experience because packet loss concealment is hiding underlying network or device problems, these problems should still be addressed.

## Video Hardware

While displays certainly have a substantial effect on the quality of the video that is seen, almost any modern screen is good enough to reproduce high quality video. If possible, the display should be configured to reproduce colors as accurately as possible, for instance cinema mode is likely to be better than vibrant mode. On the other hand, cameras can vary widely in their quality. Cisco Devices ensure a high-quality experience with displays and cameras optimized for video on the desktop to the boardroom.

When using the Webex App, it is important to consider the camera being used. A good option is to use a high-quality camera like such as the Webex Desk Camera. Using a built-in laptop webcam will often supply suboptimal quality.

Control Hub reports the camera used by each participant in a Webex Meeting or Call on Webex, this can be found in the Overview Details tab or in the Participant Details Equipment and Networks pane. In Figure 16, the Equipment and Networks pane from the Participant Details page is shown. In addition, any changes to the camera are reported in the main pane, highlighted by a pink diamond.

Equipment and Networks	
Client:	Webex Meetings 41.6.5.10
Platform:	Mac 10.15.7
Join From:	WebexApp 41.6.1.19162
Connection:	wifi
Media Node:	Mumbai, India
Local IP:	192.168.1.2
Public IP:	223.111.222.10
Audio Transport:	UDP
Video Transport:	UDP
Share Transport:	UDP
Audio Codec:	Opus (Sending) Opus (Receiving)
Video Codec:	H.264 BP (Sending) H.264 BP (Receiving)
Share Codec:	H.264 BP (Receiving)
Microphone:	MacBook Pro Microphone
Speaker:	MacBook Pro Speakers
Camera:	FaceTime HD Camera (Built-in)

**Figure 16**  
Equipment and Networks: Camera

Webex Apps and Cisco Devices allow the camera view to be seen in self-view, if the image seen in self-view is poor then the image sent to the far end will also be poor. Participants can check their self-view before and during calls to ensure they are sending a good image.

As mentioned in the Audio Hardware section, limited CPU or memory resources can also impact processing of video and therefore video quality.

## Video Environment

A participant's environment will affect the quality of the video sent to the far end. The primary factor that affects video quality is lighting, for example these things can negatively affect quality:

- A light source behind the participant (such as a window)
- A lack of diffused light on a participant's face
- Harsh upward or downward facing lighting, such as spotlights
- Low light

To learn more about these factors and how to optimize a room for video, please refer to the **Best Practices for Creating Effective video-enabled Rooms** which can be found here: <https://projectworkplace.cisco.com/learn>. While this document is focused on deployment of Cisco Devices, the information is just as valid for a Webex App running on a laptop in a home office.

While some treatments will not be possible at home, a significant improvement can be enjoyed by using a ring light or diffused LED panel placed behind the camera, facing the participant. This ensures a good, even level of light across the face.

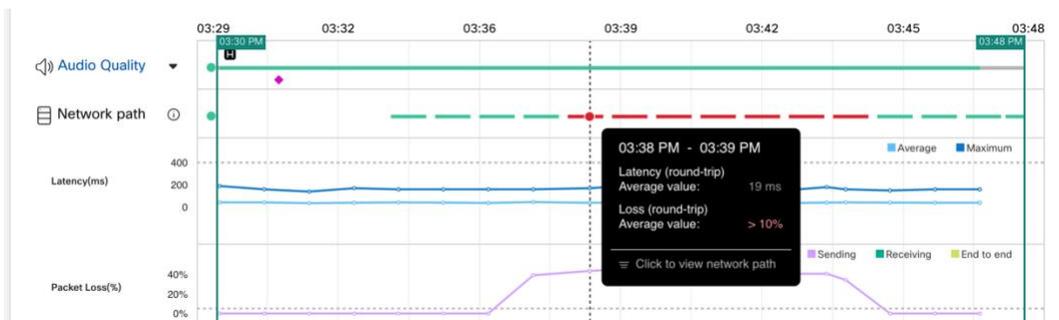
# ThousandEyes Integration

When you use ThousandEyes together with Control Hub, you get direct access to ThousandEyes path visualization data within Control Hub. This helps network administrators identify root causes for negative participant experiences for Webex App Desktop users in Webex Meetings.

Once configuration is complete, when a user with a ThousandEyes Endpoint Agent installed on their machine joins a meeting through the Webex App, a Network Path (Figure 17) line will be visible under Audio Quality in their participant details page. This line indicates the network path quality of audio data between the user's device and the audio media node. In general, audio and video data travel the same path, and are serviced by the same media node, so you can get a good sense of what the user's video quality is like, too. The network path quality is displayed as dotted lines.

Automated Session Tests enable the Endpoint Agent to monitor and identify network connections between a user's application and the destination node (host server); thereby, removing the ambiguity of knowing whether the IP addresses created in synthetic tests are going to the right datacentre or service.

In this case the Automated Session Test captures the performance of the Webex App connection to a Webex Meeting without you having to manually configure an IP address or hostname to test against. These tests are the same as Agent-to-Server Scheduled Tests, however ThousandEyes determines which endpoints to monitor. Each dotted line is based on the intervals set in the Automated Session Test.



**Figure 17**  
ThousandEyes Network Path

Loss (round-trip) reported by ThousandEyes in the Network Path is the loss percentage prior to application error recovery. A high packet loss prior to error recovery may not necessarily indicate a poor user experience because the application may have recovered some or all the data using concealment technologies. The Webex App performs packet loss recovery to enhance the user's experience during poor network connections.

You can hover over a dotted line to see the user's latency (round-trip) average value during that interval. Quality Thresholds are the same as shown in Table 1.

If data isn't available from ThousandEyes in Control Hub, the line will be Unknown (grey). You may still be able to retrieve the metric from the ThousandEyes dashboard directly.



**Figure 18**  
ThousandEyes Network Path Details

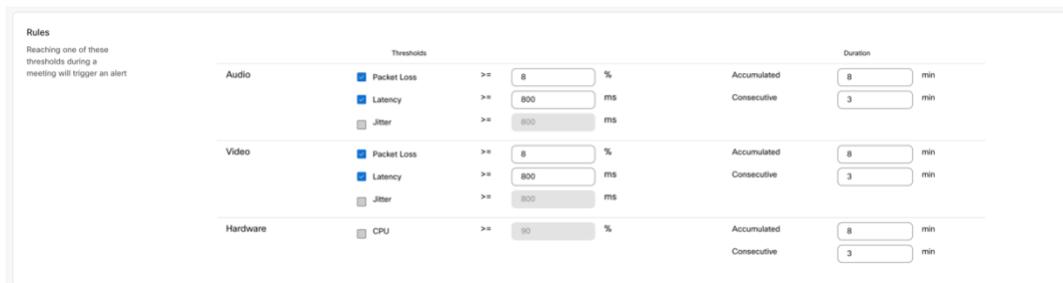
Clicking a part of the line shows a hop-by-hop breakdown of the connection to Webex (Figure 18). Problems will be highlighted in red, click the node you wish to see more details on, including loss, latency and jitter. If more detail is required, clicking **Launch the ThousandEyes Dashboard** will open a new webpage where the ThousandEyes Dashboard will show the full path visualization.

See this link for more details on the ThousandEyes integration, including how to enable it in Control Hub:  
<https://help.webex.com/en-us/article/nymfj2d/Integrate-ThousandEyes-with-Troubleshooting-in-Control-Hub>

## Alerts

It is useful to get automatically alerted if a quality related event occurs for certain participants. Alerts center in Control Hub is a convenient place to manage alerts for your Webex deployment. Administrators can configure alerts to be delivered through email, to a Webex App space or to a webhook.

Threshold-based alerts monitor for events based on thresholds, such as participants who reach more than 800ms of latency or a packet loss of more than 8% in a Webex Meeting. If a user has reported a quality problem in the past, an administrator can configure an alert so that they are informed when the user next experiences a symptom (Figure 19).



**Figure 19**  
Alert Threshold Rules for Webex Meetings

See this article for more details on Alert center: <https://help.webex.com/en-US/article/mykour/Alerts-center-in-Control-Hub>

The ThousandEyes platform also allows you to configure highly customizable alert rules and assign them to tests, to highlight or be notified of events of interest, read more here: <https://docs.thousandeyes.com/product-documentation/alerts> .

# Control Hub Meetings and Calling Analytics

While troubleshooting individual calls or meetings can lead to a resolution of an issue directly, it is often beneficial to consider the analytics available in Control Hub when diagnosing a problem. The pages of particular interest in this regard would be Analytics > Meetings > VoIP/Video Quality and Analytics > Calling > Media Quality. It is also important to consider that a brief disruption in the audio or video experience may be ignored or forgotten by a participant and go unreported. By proactively monitoring the Webex environment, administrators can ensure their users continue to have the best experience possible.

Customers who have Pro Pack generally have more historical data available to them, see this page for details: <https://help.webex.com/en-us/article/n0rlwxe/Analytics-for-Your-Cloud-Collaboration-Portfolio>

A wide range of information can be monitored, for instance in Figure 20, the percentage of participants with good quality vs poor quality video in meetings is highlighted. This is seen as a trend over time, with insights into statistics such as packet loss, latency, and jitter, as well as the percentage of participants using UDP. By monitoring this data, it is possible to understand when your organization’s video quality is changing for the better or worse.



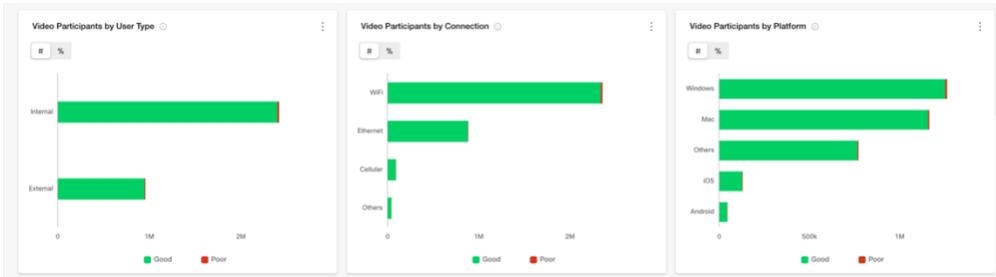
**Figure 20**  
Meetings Video Quality Trends

If video quality is trending in a certain direction, it can be helpful to view a breakdown of the participants. For instance, in Figure 21 it is possible to decide if a quality change is related more to external participants, participants on a certain network connection type, or certain hardware platform. As an example, in this case although most connections are made using WiFi, this connection type also has a slightly lower video quality than using ethernet.



**Figure 21**  
Meetings Video Quality Participant Breakdown

Clicking on an element of the chart allows the data to be filtered. In Figure 22, clicking on WiFi has filtered the data on the page by this metric. It is now possible to understand if there is a link between quality, WiFi and platform hardware.



**Figure 22**  
Meetings Video Quality Filtering

Individual participant data is also provided (Figure 23), with a list of participants experiencing the poorest quality. This allows the administrator to investigate these cases directly. Clicking the user's name opens the troubleshooting section of Control Hub, where the user's earlier meetings and calls can be analyzed in detail.

Participant Name	Email Address	Region	Location
User A	usera@cisco.com	North America	United States
User B	userb@cisco.com	APAC	Australia
User C	userc@cisco.com	North America	United States
User D	userd@cisco.com	North America	United States
User E	usere@cisco.com	North America	United States
User F	userf@cisco.com	North America	United States
User G	userg@cisco.com	EMEA	United Kingdom
User H	userh@cisco.com	Latin America	Brazil
User I	useri@cisco.com	North America	United States
User J	userj@cisco.com	EMEA	United Kingdom

**Figure 23**  
Meetings Video Quality Top Participants

Control Hub has various other analytics that can help an administrator understand how their organization is performing, see this article for more details: <https://help.webex.com/en-US/article/n0rlwxe/Analytics-for-Your-Cloud-Collaboration-Portfolio>

## Webex App and Cisco Device Statistics

It is also possible to view Audio and Video statistics from a Webex App or Cisco Device. For the desktop Webex App, these are accessed from Help > Health Checker > Diagnostics > Statistics. From a Cisco Device, go to Device settings > Issues and diagnostics > Call information. From the mobile Webex App, click the three dots and select Show Call Statistics. Figure 24 shows an example of the data that is available including Audio, Video and Share/Presentation statistics.

The screenshot shows a mobile application interface titled 'Call statistics'. At the top, there are three tabs: 'Audio', 'Video', and 'Share'. The 'Video' tab is currently selected. Below the tabs is a table with the following data:

Call on Webex	Transmit	Receive
Resolution	640 x 360	896 x 504
Frame rate	30 fps	24 fps
Bit rate	640 kbps	772 kbps
Packet loss	0 %	0 %
Roundtrip/Latency	4 ms	N/A
Jitter	0 ms	7 ms
Transport	UDP	UDP

**Figure 24**  
Mobile Statistics

This is an alternative source of information that an administrator can use to help identify network problems, or one that is available for users themselves to monitor.

## Deployment Guidance

Cisco validated design (CVD) guides are useful sources of best practice recommendations that help you select the right architecture for on-premises, hybrid and cloud collaboration deployments. When followed, the following CVD guides ensure the best quality of experience:

1. [Bandwidth Management chapter](#) of Preferred Architecture for Cisco Webex Hybrid Services, CVD.
2. [Implementing Quality of Experience for Webex in Work from Home Environments](#).