MARTELLO

VANTAGE DX

MICROSOFT PERFORMANCE DATA IN VANTAGE DX

REFERENCE GUIDE

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Microsoft Performance Data in Vantage DX
Release 3.17 - June 28, 2024

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Introduction

Document Purpose and Intended Audience

Welcome to the *Microsoft Performance Data in Vantage DX* Reference Guide.

This document provides information about the Microsoft data available in Vantage DX deployments that include the following integrations:

- Microsoft Call Quality Dashboard (CQD)
- Microsoft 365
- Vantage DX Diagnostics
- Vantage DX Monitoring

The guide describes the Microsoft performance data that is available in the Vantage DX Analytics interface.

The information available depends on your license package. This guide may contain information about functionality that is not available in your deployment.

This guide is intended for use by system administrators and IT managers.

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Integrate Data from your Microsoft Tenant

Use the information in this section to begin monitoring the call quality that your Teams users are experiencing, as well as the health state of your Microsoft services. Complete the setup tasks listed in the following table.

Task	Description
"Install the Microsoft CQD Integration" on page 10	Configure the integration between the Microsoft CQD and VDX Analytics. This integration allows you monitor call quality data about your users in near-real time.
"Install the Microsoft 365 Integration" on page 16	Configure the integration between your Microsoft 365 subscription and VDX Analytics. This integration allows you to monitor the health state of your Microsoft services, including the status of licenses.
"Configure Meeting Room Data" on page 18	Optional. If you have meeting rooms and devices configured in the Microsoft Teams admin portal, we recommend that you create a rule in VDX Analytics that consolidates the meeting room data from Microsoft 365 with the usage data from the Microsoft Teams CQD.

Install the Microsoft CQD Integration

Use this procedure to integrate the Microsoft Call Quality Dashboard (CQD) with VDX Analytics.

Before you Begin

Log into the Microsoft Call Quality dashboard through the Office 365 portal and verify that the CQD is activated and accessible.

1. From the main menu, select **Settings**.
   The Integrations tab displays the currently installed integrations.
2. Click the **Add** button at the bottom of the page.
3. Select a monitoring system from the dialog box.
4. Enter the information required for the monitoring system.
5. Click **Save**.

Configure the following properties when you integrate the Microsoft Teams CQD with VDX Analytics to monitor remote users:

Property	Description
Set-up	
Integration Name	Provide a name for the integration; this name displays on the VDX Analytics interface.
Agent	Select a server to communicate with the source system. This can be the VDX Analytics web server or a machine that has a VDX Analytics Remote agent installed on it.
Credentials	
Azure Login Name	The Microsoft 365 account that VDX Analytics can use to access the CQD.
Azure Login Password	The password for the Microsoft 365 account.
MFA Shared Secret (Optional)	The optional shared secret is used for multi-factor authentication for Azure Active Directory. To use this option, the account that VDX Analytics uses to connect to your Microsoft CQD must use Azure MFA with a passive authentication flow. In addition, the account must be cloud-native.
	To generate the password for this field, see the following Knowledge Base article:
	https://helpcenter.martellotech.com/s/article/000001082
Leverage Martello VDX Enterprise App	This option is enabled by default. We recommend that you do not change the setting. It allows the integration to use the permissions that you granted to the Martello VDX App when you first registered it.
Data Processing	

Property	Description
Tenant Size	Select the tenant size based on the number of users, or select Custom to provide an alternate value. The selected tenant size sets the defaults for the rest of the data processing values.
Data Retrieval Period	The number of days of data from the CQD to display in VDX Analytics. This value changes based on the size of the selected tenant. If you selected a custom tenant size, you must provide a value.
Max Data Query Time (minutes)	The maximum time in minutes allowed for a single CQD query. This value changes based on the size of the selected tenant. If you selected a custom tenant size, you must provide a value.
Data Window Incremental (minutes)	The amount of time in minutes that the CQD query will look back from the last call that was loaded into the database. The default value is 120 minutes; however, if you select a custom tenant size, you must enter a value.
Use Incremental Sync Start	When enabled, this option retrieves data beginning from the day of the integration, as opposed to VDX Analytics also retrieving historical data. This default value for this option changes, depending on the selected tenant size. If you selected a custom tenant size, you can enable or disable this option.
Split Properties over Multiple Queries	This option is disabled by default and cannot be enabled unless you selected a custom tenant size. Enable this option only if you are advised to do so by a Martello support engineer.
Add Good Calls as Information Events	Select this option if you want each call to display as a separate component in VDX Analytics. This option is disabled by default and cannot be enabled unless you selected a custom tenant size. **Warning:** This option significantly increases the amount of data that VDX Analytics retrieves and stores. If you select this option, it may impact the performance of VDX Analytics.

Property	Description
Discovery Interval (minutes)	The interval for collecting components and relationships from the integrated system. This value changes based on the size of the selected tenant. If you selected a custom tenant size, you must provide a value.
Operation Interval (minutes)	The interval for collecting alerts, incidents, and component health states. This value changes based on the size of the selected tenant. If you selected a custom tenant size, you must provide a value.
Thresholds	
Poor Call Warning Ratio (%)	The threshold used by VDX Analytics to trigger a warning about the health status of a user device. Use this field to specify the percentage of poor calls that must occur during the time period used to calculate health status. The time period is set in the Hours to Look Back for Health Status field. By default, the call warning ratio is 20%.
Poor Call Critical Ratio (%)	The threshold used by VDX Analytics to trigger a critical alert about the health status of a user device. Use this field to specify the percentage of poor calls that must occur during the time period used to calculate health status. The time period is set in the Hours to Look Back for Health Status field. By default, the call critical ratio is 30%.
Jitter (ms)	Set the jitter threshold to use. Jitter indicates the size of the buffer that is needed to store packets before they are reconstructed in the correct order. Jitter can cause delays in calls and is an indicator of congestion of the network. Jitter is averaged over 15-second intervals for the duration of the call. Microsoft classifies call quality as poor when the average exceeds 30 ms. By default, VDX Analytics raises an alert when jitter exceeds the 30 ms threshold, but you can use this field to change the threshold that triggers an alert.

Property	Description
Round Trip Time (ms)	Set the round trip time (RTT) threshold to use. RTT is the time in milliseconds that it takes a data packet to travel from point A to B and return. It is determined by the physical distance between the two points, the speed of transmission, and the overhead taken by the routers in between. RTT is averaged over 15-second intervals for the duration of the call. A value over 500 ms can cause poor call quality. By default, VDX Analytics raises an alert when RTT exceeds the 500 ms threshold, but you can use this field to change the threshold that triggers an alert.
Packet Loss (%)	Set the packet loss threshold to use. The number of packets lost in a 15-second interval. Packet loss is calculated as a percentage. For example, if 1000 packets are sent in a 15-second interval and 50 are lost, the packet loss rate is 5%. By default, VDX Analytics raises an alert when packet loss exceeds the 10% threshold, but you can use this field to change the threshold that triggers an alert.
Localization	
Timezone	Data collected by the Microsoft CQD is stored in UTC. You can use this setting to have VDX Analytics convert from UTC to another time zone.
Localize Call Times	Select this option to show calls in the local timezone of the participant. When you select this option, the local time is shown for each endpoint in the call. VDX Analytics uses the geolocation to determine the local timezone. If geolocation information is not available, the timezone defaults to UTC.

Property	Description
Office Display Names	Optional. Use this field if you want to customize the office names that are displayed in the dashboards. To use this feature, complete the following steps: 1. Create a .CSV file that lists the office names you wish to display. Enter one line for each office, using the following format: `<ipaddress>,<officename>,add` 2. Upload the file to OneDrive. Ensure that the file is shared with the Microsoft 365 account that is assigned to the integration and that the file is downloadable. 3. Click the main menu and select **Settings**. 4. On the Integrations tab, locate the Microsoft CQD integration and clicking the **Edit** icon. 5. In the **Office Display Names** field, enter the OneDrive link to the .CSV file that you shared with the Microsoft 365 account in Step 2. 6. Click **Save**. If you do not use this option, offices are identified by their IP addresses only.
Privacy Protection	
Anonymize Data	Select this check box if you do not want to show identifiable information for your users, such as names, email addresses, and IP addresses. User information displays as number strings.
Disable Caller Resolution	Select this check box if you do not want to show identifiable information about call recipients. When you choose this option, VDX Analytics displays the name of the user who placed a call, but does not show the name of the call recipient
External Users	
Track External Users	Select this check box to include external users in the number of attendees who participated in Teams meetings. Vantage DX Analytics displays objects for external users and devices and provides a link to the meeting in which they participated.

Property	Description
Track External Users in Location Groups	Select this check box if you want to include external users in the groups that Vantage DX Analytics creates for cities and countries.
Options	
Health Status Period (hours)	The number of hours used to calculate the health status of objects. By default, this field is set to 48 hours; however, you can edit this value if you want to calculate the health status over a different period of time.
Disable Dashboard Data Retrieval	Select this check box if you do not want VDX Analytics to retrieve and store data for the dashboarding feature. If you select this option, ensure that you also disable the dashboarding feature using the options on the **Settings > General Settings** page.

Install the Microsoft 365 Integration

Use this procedure to integrate your Microsoft 365 subscription with VDX Analytics.

Before you Begin

The Vantage DX Analytics application must be registered in Azure Active Directory and you must grant consent for the application to retrieve data. If you have configured SSO, the application is already registered and has the necessary permissions. If you have not performed this step, click the following link to automatically register the application, and then follow the prompts on the screen to sign in and grant consent:

https://login.microsoftonline.com/common/adminconsent?client_id=0d75f118-91b7-4a02-8c52-25d8a1590a7c

For a list of permissions that you are granting to the application, see the "Permissions and Access" topic in the Requirements section of the *Vantage DX Deployment Guide*.

1. From the main menu, select **Settings**.
   The Integrations tab displays the currently installed integrations.
2. Click the **Add** button at the bottom of the page.
3. Select a monitoring system from the dialog box.
4. Enter the information required for the monitoring system.
5. Click **Save**.

Configure the following properties when you integrate Microsoft 365 with VDX Analytics:

Property	Description
Source	Read-only. The name of the source system.
Agent	Select a server to communicate with the source system. This can be the VDX Analytics web server or a machine that has a VDX Analytics Remote agent installed on it.
Name	Provide a name for the integration; this name displays on the VDX Analytics interface.
Leverage Martello VDX Enterprise App	Select this checkbox if you have used the automated option to register the application in Azure AD. When you select this option, you need to provide your Tenant ID only; you do not need to enter a Client ID or a Client Secret Key.
Tenant ID	Required. For information about how to find your Microsoft tenant GUID, see https://docs.microsoft.com/en-us/onedrive/find-your-office-365-tenant-id.
Client ID	The Application (Client) ID from the above Azure Application registration. This information is required only if you are registering the application and granting consent manually.
Client Secret Key	The Client Secret associated with the Azure Application registration. The Client Secret can have an expiry date configured; if your Client Secret has an expiry date, you will need to regenerate it and update the integration when it expires. This information is required only if you are registering the application and granting consent manually.
Collect Teams Devices	Optional. Select this checkbox to collect information about the following Teams meeting room devices: • Teams Room devices • Surface Hub devices • Teams Panel devices • Collaboration Bar devices • Teams Display devices • Touch Console devices

Property	Description
Collect IP Phones	Optional. Select this checkbox to collect information about the following Teams meeting room IP Phone devices: • IP Phone devices • Low-Cost Phone devices • SIP devices
Discovery Interval	How often the objects are loaded from the integrated system. The default is 3600 seconds.
Operation Interval	How often health states, alerts, and/or incidents are collected. The default is 120 seconds.

> **Note:**
> If you prefer to register the application and grant consent manually, refer to the following Knowledge Base article:
>
> https://helpcenter.martellotech.com/s/article/Microsoft-365-Integration-VDX-A-Requirements
>
> If you follow the manual process, ensure that you grant the permissions listed in "Permissions for the VDX Application" on page 1.

Configure Meeting Room Data

As part of the integration with Microsoft 365, VDX Analytics retrieves data about the meeting room devices that are configured in the Microsoft Teams admin portal, including:

- General information, such as the model number, serial number, and MAC address.
- Health state.
- Peripherals associated with the meeting room device, and their status.

VDX Analytics also retrieves data related to meeting rooms from the integration with the Microsoft Teams Call Quality Dashboard (CQD). If you have meeting rooms and devices configured in the Microsoft Teams admin portal, we recommend that you create a rule in VDX Analytics that consolidates the meeting room data from Microsoft 365 with the meeting room and usage data from the Microsoft Teams CQD. Doing so allows you to view and manage one component that contains all of the data that is available for that meeting room. For example, you can use the consolidated component to see the properties of the meeting room and its devices,

as well as information such as the location, the ISP, number of calls, and information about the call types.

When you create a consolidation rule, VDX Analytics creates a component; the component name is based on the name of the account that is used to log into the meeting room device. The interface lists Consolidation as the source system for the new component because it is created by VDX Analytics rather than retrieved directly from another system. The following image shows an example of a meeting room component that was created using a consolidation rule. In this example, "Cathcart" is the name of the account used to log into the meeting room device, which is also the name of the meeting room.
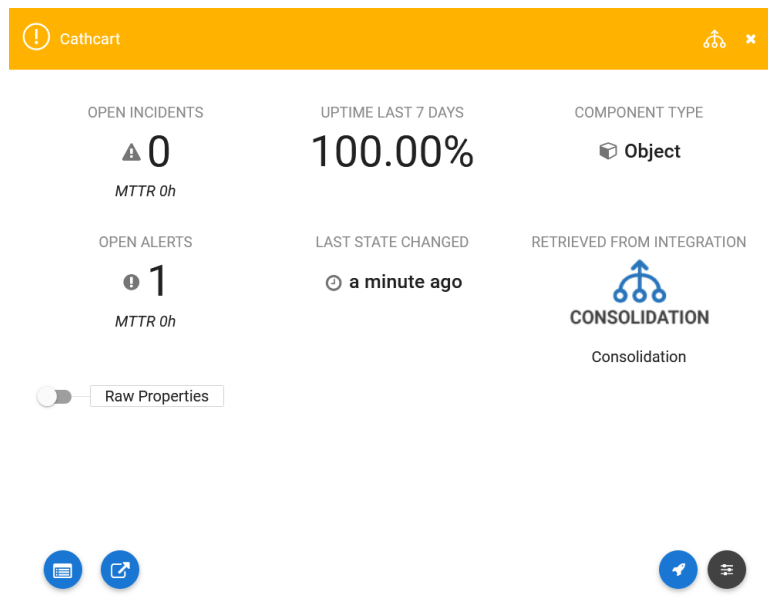
Use the following procedure to configure a rule that consolidates the meeting room data from Microsoft 365 with the meeting room data from the Microsoft Teams CQD. You must be an administrator to perform these steps.

1. From the VDX Analytics main menu, select **Settings** and click the **Consolidation Rules** tab.
2. Click the expansion icon next to **Object**.
   This setting determines the type of component that VDX Analytics creates.
3. Click **Add Rule**.
4. Enter the following information:
   - **Rule Name**—Enter a name for the rule, such as Teams Meeting Rooms.
   - **Description**—Enter a description of the rule.
5. Choose one of the following options and enter the information shown in the **Field Mapping** section:

Option 1: Create a rule that consolidates a meeting room and its devices—as well as non-meeting room devices such as IP phones and SIP devices—into one component. To use this option, ensure that you have selected the "Collect IP Phones" option in the Microsoft 365 integration settings.

Row	Field	Description
	Integration Type	Microsoft Teams Call Quality
1	Field Name	source.Office365CQD.Id
	Match Type	Exact Match
	Integration Type	Microsoft 365
2	Field Name	source.Office365.Id
	Match Type	Exact Match
	Integration Type	Microsoft 365
3	Field Name	source.Office365.currentUser.id
	Match Type	Exact Match

Option 2: Create a rule that consolidates data about meeting rooms only, and does not include non-meeting room devices.

Row	Field	Description
	Integration Type	Microsoft Teams Call Quality
1	Field Name	source.Office365CQD.Id
	Match Type	Exact Match
	Integration Type	Microsoft 365
2	Field Name	source.Office365.Id
	Match Type	Exact Match

6. Click **Save**.
7. Click the **Action** button and then click the **Start Consolidation** icon.
8. Click **Ok**.

Dashboards for Data Analysis

The **Data Analysis** menu provides access to dashboards that help you correlate data from a range of sources. The dashboards contain call quality data from the following sources:

- Microsoft Teams Call Quality Dashboard (CQD)
- Microsoft 365
- Vantage DX Monitoring
- VDX Diagnostics
- AudioCodes Session Border Controllers (SBCs)

Access to the dashboards is role-based. By default, only administrators can view the dashboards. Users in other roles can view the dashboards only if an administrator has assigned access to them. For information about how to assign dashboards to roles, see the *Vantage DX Deployment Guide*.

The following sections describe the dashboards, and the functions and data that are available on each:

> **Note:**
> Vantage DX stores data in Elasticsearch. For this reason, it relies on a third-party service—the Elastic stack—to display data in the

> dashboards. Your browser settings must allow third-party cookies in order to access the Vantage DX dashboards. Some browsers have a default setting that blocks third-party cookies in order to protect privacy and prevent tracking. You can safely change this default setting for Vantage DX; the communication between Vantage DX and the Elastic stack is secured and no tracking occurs.

Understanding Dashboard Data

The information presented in the dashboards includes call quality data that VDX Analytics retrieves through its integration with the Microsoft Call Quality Dashboard (CQD). The dashboards in VDX Analytics are designed to provide information about the quality of calls, as well as the experience of users who participated in those calls. Because of this focus, there are differences between how call quality data is presented in the dashboards and how it is presented in the Microsoft CQD, even though the source data is the same. The following sections explain how VDX Analytics calculates and displays call quality metrics:

- "Data Types" on page 22
- "Health State Calculations: Aggregated Data" on page 24
- "Health State Calculations: Stream Data" on page 25
- "Calculations for Poor Call Reasons" on page 25
- "VDX Analytics Dashboards and the Microsoft CQD" on page 44

Data Types

The information in the VDX Analytics dashboards is based on four types of data:

- **Streams**— A stream represents a single flow of data between a user and a call server. A stream is created for each direction and each type of connection; for that reason, the number of streams in a call will exceed the number of participants in a call. For example, a call between two users who are both sharing video contains four streams: two for the audio connections and two for the video connections.
- **Segments**—A segment represents a user device in a call and is an aggregation of the call streams associated with that user device. There is a single segment for each user device. For example, if four participants connect to a call, each using one device, the call has four segments. If a user connects to the same call from two devices, there will be two segments associated with that user.
- **Conferences**—A conference is an aggregation of call segments. The health of a conference is calculated based on the segments.
- **Peer-to-peer calls**—A peer-to-peer call is an aggregation of two call segments. The health of a call is calculated based on the segments.

These different data types mean that some of the data you see on the VDX Analytics dashboards is aggregated data, and some is stream data. The following sections explain where each type of data is presented on the dashboards:

Aggregated Data

Most of the widgets in the VDX Analytics dashboards display aggregated data. VDX Analytics retrieves stream data through its integration with the Microsoft CQD. It then aggregates the streams into segments, and aggregates segments into conferences. The following diagram shows how data is aggregated in VDX Analytics dashboards.

Figure 1: Example of Data Aggregation
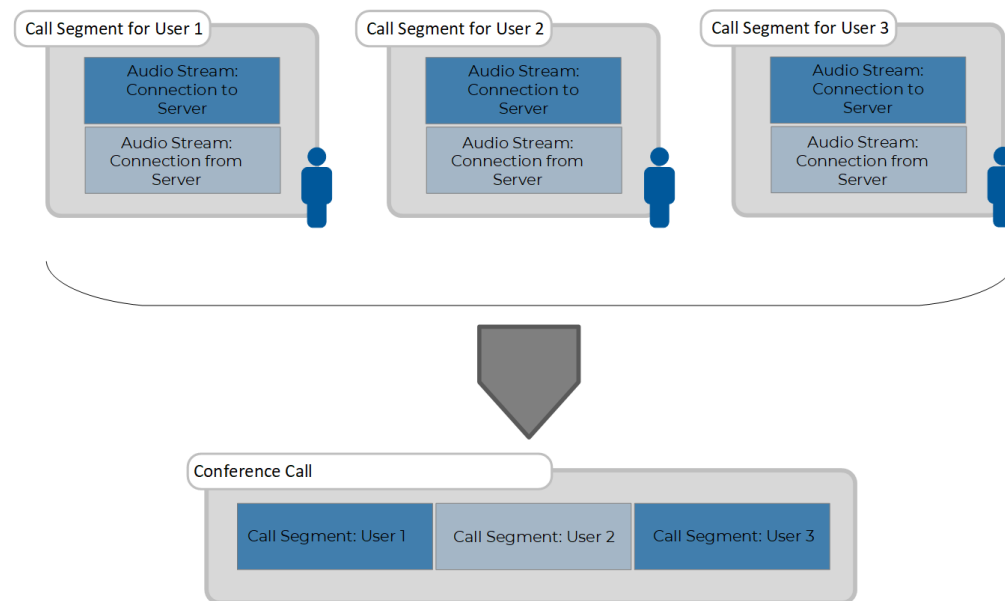
Stream Data

Some widgets do not display aggregated data; instead, they display stream data. The following widgets display stream data:

- Inbound Audio — User(s) with Critical Mean Opinion Score
- Outbound Audio — User(s) with Critical Mean Opinion Score
- Inbound Audio — Stream(s) Details
- Outbound Audio — Stream(s) Details
- Inbound Video and Screen Sharing — Problematic Stream(s) Details
- Outbound Video and Screen Sharing — Problematic Stream(s) Details

These widgets are available on the Calls Dashboard.

Health State Calculations: Aggregated Data

Microsoft collects call quality metrics for call streams and classifies each one based on those metrics. The metrics used to determine these classifications depend on the type of call stream. For example, the quality of voice calls is determined based on metrics such as RTT and jitter, while video calls are based on frame rate, frame loss, and other metrics. For information about how Microsoft classifies calls, see the following Microsoft article:

https://learn.microsoft.com/en-us/microsoftteams/stream-classification-in-call-quality-dashboard

VDX Analytics aggregates the streams into call segments and calculates the health state of the segment based on the following information:

- The stream classification from Microsoft.
- The thresholds for jitter, round-trip time, and packet loss, which you set when you configure the integration between VDX Analytics and the Microsoft CQD. You can use these integration settings to make the health state calculations more stringent than the Microsoft calculations if you wish.

Using this information, VDX Analytics calculates the health state of the segment based on the worst-state stream contained within that segment. For example, if one stream is classified as Poor, the entire call segment will be marked as Poor, as shown in the following diagram.

Figure 2: Health State Calculation for Call Segments
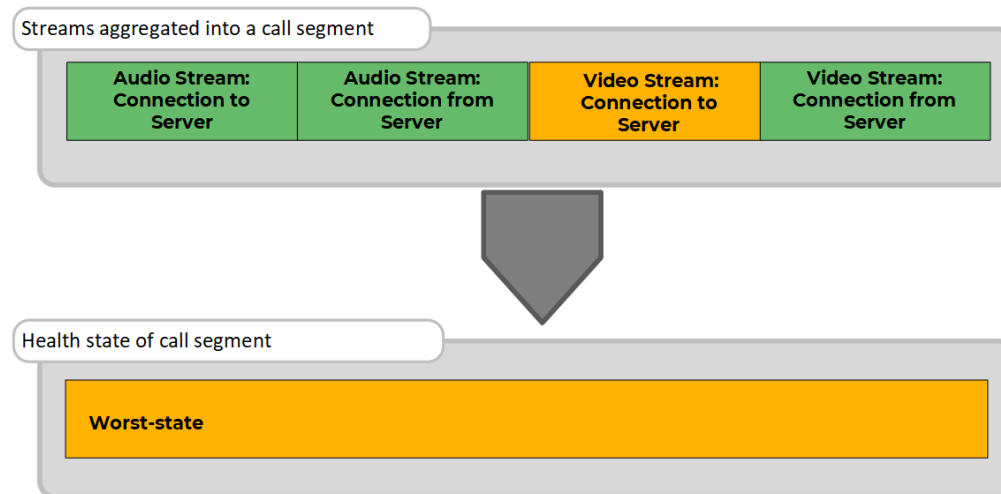
After VDX Analytics calculates the health of a call segment, it uses this data to determine the health of the call as a whole. For example, the Good Conference Rate widget aggregates the call segment data as follows:

- If more than 30% of the segments in a conference call are classified as failed, the dashboards show that the conference call as a whole is failed.
- If the combined number of segments that are classified as poor or failed is 30% or more, the dashboards show that the conference call as a whole is poor.
- If less than 30% of the call segments are classified as poor or failed, the dashboard shows that the quality of the conference was a good.

The following diagram shows an example of how the Good Conference Rate is calculated. In this example, the call has four participants and one segment is classified as poor. Because less than 30% of the call segments are classified as poor, the dashboard shows that the quality of the conference was good overall.

Figure 3: Health State Calculation for a Conference
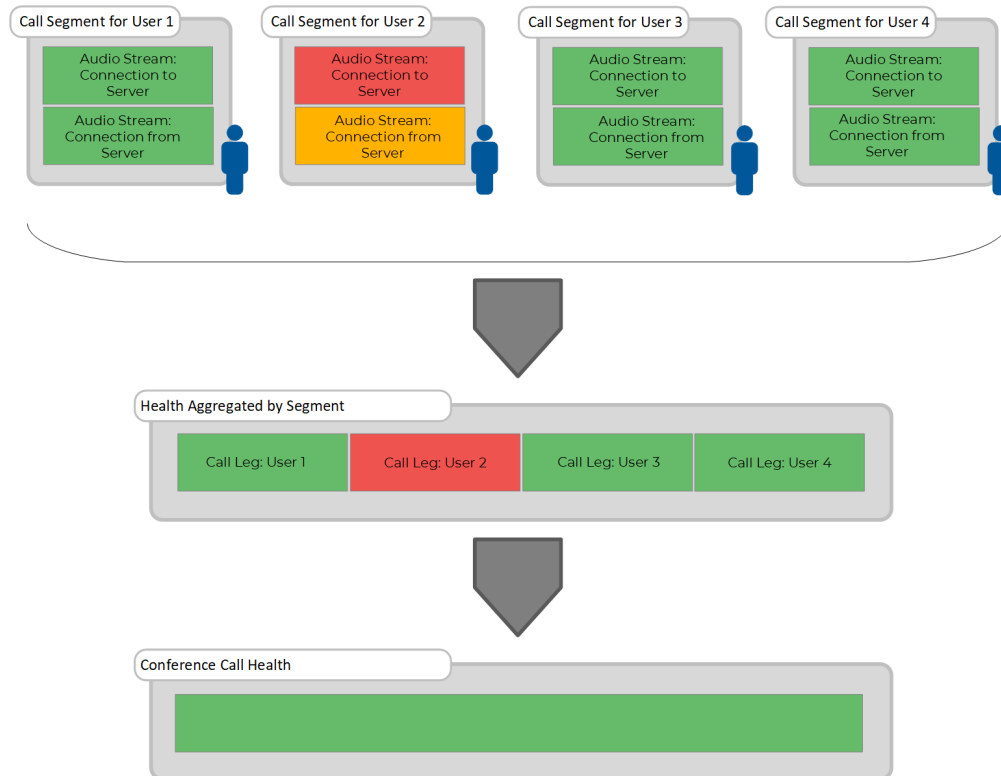
This approach allows you to see how many meetings were impacted by poor call quality, rather than how many streams were impacted. After you understand how many meetings were impacted, you can use the dashboards to see which users and which locations were impacted. By aggregating the data this way, VDX Analytics allows you to quickly understand how often call quality problems are affecting the tools that you rely on for productivity.

Health State Calculations: Stream Data

Video and screen sharing data is based on streams. The health state of video and screen sharing streams is based on Microsoft's thresholds.

For audio streams, the MOS score is calculated by VDX Analytics. The calculation is based on latency, packet loss, jitter, and the codec used.

Calculations for Poor Call Reasons

Some dashboard widgets list the reason why a call was classified as poor. For example, the Locations dashboard includes bar chart that displays the number of occurrences of poor calls for each office, as well as the reason why the call was

classified as poor. The Users dashboard, the Calls dashboard, and the Meeting Rooms dashboard also list reasons for poor call quality in their Recent Calls tables.

The calls are classified as poor based on the following criteria:

- **Microsoft classifications**—Microsoft classified the call as poor based on any of the following metrics:
  - Round Trip Time
  - Jitter
  - Packet Loss
  - Video Frame Rate
  - Video Frame Loss
  - Video Post FEC PLR
  - RDP Tile Processing Latency
  - Relative One-Way Average
  - Spoiled Tile Percentage
- **Vantage DX classifications based on custom thresholds**—When you integrate your Microsoft CQD with Vantage DX, you can set the following custom thresholds:
  - Round Trip Threshold
  - Jitter Threshold
  - Packet Loss Threshold

  Vantage DX classifies your call based on your custom thresholds; therefore, a call that is classified as good by Microsoft may be classified as poor by Vantage DX if you custom thresholds are more stringent. If Vantage DX classified a call as poor based on your custom thresholds, it performs additional calculations to determine the reason why the call was poor. The potential reasons are:
  - WiFi Signal Strength
  - Callee WiFi Signal Strength
  - Network Bandwidth
  - Network Switch
  - Dropped Streams
  - Teams CPU
  - System CPU
  - Teams Memory
  - System Memory
- **Vantage DX classifications based on tests for video and screen-sharing streams**—Microsoft classifies each video and screen-sharing stream as good or poor. Vantage DX performs additional tests on these streams, even if Microsoft has classified the stream as good. In some instances, this extra layer of testing identifies problems in calls that were classified as good. If the additional testing identifies that any of the metrics breached the performance threshold, the metric is listed as a reason for poor call quality in the Vantage DX dashboards and alerts. The following metrics are tested:

- Video Frame Rate—For video and screen-sharing streams.
- Video Frame Loss—For video and screen-sharing streams.
- Video Post FEC PLR—For video streams only.

Causes for Poor and Failed Call Reasons

The following table provides descriptions, threshold conditions, and possible root causes for the metrics that are used as the poor call reasons in Vantage DX.

This information can help you troubleshoot and resolve the issues in your network infrastructure.

Metric/Reason	Description	Condition	Reported by	Root Cause
Round Trip Time	Round trip time is the time it takes for a data packet to travel from its source to its destination and back again.	> 500 ms	Microsoft CQD	High round trip time may be due to the following causes: • Network congestion due to too many devices connected to the same network. • Physical distance between source and destination like when a server in New York communicating with a device in Tokyo.
Round Trip Threshold	This metric reflects the responsiveness and effectiveness of the network infrastructure.	> 500 ms (default)	Vantage DX	• Poor network hardware. For example outdated routers or switches that are unable to handle the data load.

Metric/Reason	Description	Condition	Reported by	Root Cause
Jitter	Jitter is the variation in time delay between when a signal is transmitted and when it's received over a network connection, measuring the variability in ping.	> 30 ms	Microsoft CQD	High jitter may be due to the following causes: • Network congestion such as heavy traffic during peak hours. • Improper queuing and prioritization of VoIP packets. • Unstable network hardware such as faulty routers or modems.
Jitter Threshold	Monitoring jitter is crucial as high jitter can lead to a poor user experience in real-time applications.	> 30 ms (default)	Vantage DX	

Metric/Reason	Description	Condition	Reported by	Root Cause
Packet Loss	Packet loss measures the data packets that fail to reach their intended destination within a specific time frame.	> 0.1 rate (equivalent to 10 %)	Microsoft CQD	Causes for packet loss can include the following: • Network congestion such as too many users streaming video at the same time. • Signal degradation over the network medium like interference on a wireless network. • Faulty networking hardware such as a failing switch or router. • Software issues like bugs in the network drivers or operating system.
Packet Loss Threshold	High packet loss may result in a degraded user experience, especially during real-time communication situations.	> 10 % (default)	Vantage DX	

Metric/Reason	Description	Condition	Reported by	Root Cause
Video Frame Rate	Video frame rate is the average number of image frames displayed per second during a video call or video-based screen sharing stream. A higher frames per second(FPS) rate yields a smoother video appearance on the viewer's screen. A lower FPS results in video streams that are choppy and the audio and video may no longer be in synch.	< 7 FPS	Microsoft CQD	Low video frame rate may to due to the following causes: • Network issues including high round trip time or packet loss. • Insufficient processing power such as older computers trying to stream high-definition video. • Poor-quality video sources like a low-resolution video feed.

Metric/Reason	Description	Condition	Reported by	Root Cause
Video Frame Loss	Video frame loss is the average percentage of video frames that are lost during a video call or video-based screen sharing stream. High frame loss can lead to a degraded viewing experience.	> 50 %	Microsoft CQD	Causes of high video frame loss may include: • Network congestion due to too many devices connected to the same network. • Low bandwidth such as trying to stream high-definition video on a slow internet connection. • Poor network connections such as an unstable Wi-Fi signal.

Metric/Reason	Description	Condition	Reported by	Root Cause
Video Post FEC PLR	This is the packet loss rate (PLR)after forward error correction (FEC) has been applied aggregated across all video streams and codecs. As video post FEC PLR increases, video quality degrades. and may appear choppy or pixelated.	> 0.15	Microsoft CQD	High video post FEC PLR values may indicate: • Issues with the network due to high packet loss or jitter. • Issues with the FEC mechanism itself such as insufficient redundancy in the error correction codes.

Metric/Reason	Description	Condition	Reported by	Root Cause
RDP Tile Processing Latency Average	This is the average processing time in milliseconds for the compression and decompression of remote desktop protocol (RDP) tiles. A higher total value implies a longer delay in the viewing experience.	> 400 ms	Microsoft CQD	Causes for high RDP tile processing latency average may include: • Network latency such as a slow or congested network. • Server performance issues that may occur when a server is overloaded with requests. • Client device performance issues if the client device has insufficient processing power or memory.

Metric/Reason	Description	Condition	Reported by	Root Cause
Relative OneWay Average	This is the average amount of one-way latency, which measures the delay in seconds between the client and the server.	> 1.75 s	Microsoft CQD	High relative oneway average values may indicate the following causes: • Network congestion if there are too many devices connected to the same network. • Physical distance between the server and the device with which it is communicating. • Poor network hardware such as outdated or failing routers or switches.

Metric/Reason	Description	Condition	Reported by	Root Cause
Spoiled Tile Percent Total	The total percentage of Teams application sharing stream content that did not reach the viewer but was instead discarded and overwritten by fresh content.	> 36 %	Microsoft CQD	High spoiled tile percent total values may indicate the following causes: • Network issues caused by high round trip time or packet loss. • Server performance issues due to a server that is overloaded with requests. • Client device performance issues such as insufficient processing power or memory.

Vantage DX Additional Testing Poor Call Reasons

Metric/Reason	Description	Condition	Reported by	Root Cause
Wi-Fi Signal Strength	Wi-Fi signal strength is a measurement of how well the caller and callee devices can hear a signal from an access point or router.	< 80 %	Vantage DX	Low Wi-Fi signal strength may be caused by: • Physical obstructions like walls or furniture. • Interference from other devices such as ., microwaves or cordless phones. • Physical distance from the router.
Callee Wi-Fi Signal Strength	Low signal strength may result in poor connection quality, dropped connections, or slow data transfer rates.			

Metric/Reason	Description	Condition	Reported by	Root Cause
Network Bandwidth	Network bandwidth is the maximum rate of data transfer across a given path. Monitoring bandwidth is important to ensure that you have enough capacity to handle your data needs.	< 1 Mbps	Vantage DX	Causes for low network bandwidth may include: • Network congestion when there are too many users or high data usage. • Hardware limitations like outdated network equipment. • ISP throttling due to the internet service provider reducing speed during peak usage times.

Metric/Reason	Description	Condition	Reported by	Root Cause
Network Switch	Network switch refers to the status or performance of the network switches in your infrastructure. Examples of network switching are when a call participant changes from a Wi-Fi connection to a cell connection during a call, or a call participant switches between Wi-Fi base stations, or a call disconnects and reconnects. Monitoring this can help detect failures or performance issues in your network.	Yes	Vantage DX	When a network switch occurs, causes for concern include: • Hardware failures such as a switch failing due to age or electrical issues. • Firmware issues like bugs in the switch's software. • Network loops when two switches are connected more than once.

Metric/Reason	Description	Condition	Reported by	Root Cause
Dropped Streams	Dropped streams refers to the number of streaming sessions that were unexpectedly terminated.	If occurred	Vantage DX	Dropped streams may be due to the following causes: • Network instability such as an unstable Wi-Fi connection. • An overloaded server that is unable to handle the stream. • Client device problems such as the device has a poor internet connection or insufficient resources to handle the stream.

Metric/Reason	Description	Condition	Reported by	Root Cause
Teams CPU	Teams CPU is the CPU usage of the Microsoft Teams application. High CPU usage can lead to poor application performance.	> 50 %	Vantage DX	High Teams CPU usage causes may include: • Other resource-intensive applications running on the same machine, such as video editing software. • Issues within Teams itself like a memory leak that causes Teams to use more CPU resources.

Metric/Reason	Description	Condition	Reported by	Root Cause
System CPU	System CPU is the overall CPU usage of the system. Consistently high CPU usage can lead to system slowdowns or instability.	> 80 %	Vantage DX	High system CPU may be caused by: • Running too many resource-intensive applications at once. For example, running a video game, a web browser with many tabs open, and a video call at the same time. • Underlying hardware issue such as an old or failing CPU.

Metric/Reason	Description	Condition	Reported by	Root Cause
Teams Memory	Teams memory is the memory usage of the Microsoft Teams application. High memory usage can lead to poor application performance.	> 50 %	Vantage DX	High Teams memory usage may be due to the following causes: • Memory leaks within Teams when the application does not release memory back to the system after it's done using it. • Other resource-intensive applications using up available memory, such as a web browser with many tabs open.

Metric/Reason	Description	Condition	Reported by	Root Cause
System Memory	System memory is the overall memory usage of the system. High memory usage can lead to system slowdowns or instability.	> 80%	Vantage DX	High system memory usage may be due the following causes: • Running too many resource-intensive applications at once. For example, running a video game, a web browser with many tabs open, and a video call at the same time. • Not enough physical memory installed.

VDX Analytics Dashboards and the Microsoft CQD

Because VDX Analytics aggregates call data based on segments, the call statistics shown in the dashboard will differ from the call statistics shown in the Microsoft CQD.

The Microsoft CQD displays data based on the streams; it does not aggregate the data based on calls. As a result, the call quality statistics presented in the Microsoft CQD—or in a PowerBI report if you use it to analyze your CQD data— will not match the statistics provided by the dashboards in VDX Analytics. Similarly, the volume of calls shown in the Microsoft CQD is based on streams and will not match the total number of calls shown in VDX Analytics. Other tools, such as the MS Teams Admin Portal, may aggregate the data and display it differently.

Dashboard Controls
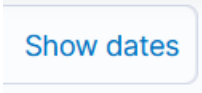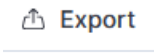
By default, the dashboards refresh every 60 minutes. Administrators can change the refresh interval using the option available on the **Settings > General Settings** page.

For best viewing, we recommend that you use the following settings:

• Screen Resolution: 1920 x 1080 or higher

- Scale: 150% (Windows setting)
- Browser zoom: 100%

The following controls are available on the dashboards:

Icon	Function	Description
	Time filter options	The dashboards can display data from the past 90 days. There are two options for selecting a time filter: - Quick select—Click the calendar icon to select pre-defined time periods. - Show dates—Click this option to enter specific time periods. After you change the time filter, click the **Update** button to apply the changes. The times shown in the dashboard are based on the timezone in your browser settings.
+ Add filter	Show and clear filters	This field populates automatically when you select a filter in a widget. You do not need to add a filter in this field. If you select a filter in a widget, you can clear the filter by clicking the **X** in this field.
Ottawa, CA	Text displayed in blue	Text displayed in blue indicates that filter options are available. You can hover over the text and click the **Plus** (+) icon to see the filter options.
☰	Legend	Click this icon to view a legend that describes the colors used on graphs.
⬆ Export	Export	Click this icon to download tabular data as a raw or formatted (CSV) file.

Adding Calls to the Dashboards

Vantage DX provides you with the option to retrieve data about calls that occurred outside of the data collection window, which is defined in the integration settings in the **Data Retrieval Period (days)** field.

Use the following procedure if you have a Call ID from the Microsoft Call Quality Dashboard (CQD) and would like to view data about that call on the Vantage DX dashboards. You must be an administrator to perform this procedure.

1. From the main menu, select **Settings**.
   The Integrations tab displays the currently installed integrations.
2. Locate the Microsoft Teams CQD integration and click on the **</>** (code) icon.
3. Enter the Call ID of the call you wish to retrieve. To enter multiple Call IDs, separate each ID by a comma.
4. Click **OK**.

> **Note:**
> If you add a Call ID for a call that already exists in the dashboard, you will see duplicate data for the call.

Teams Overview Dashboard

Use this dashboard to understand the issues that are occurring with Microsoft Teams calls, and which users and locations are most affected.

The following table lists the performance metrics that are displayed on the Teams Overview dashboard.

Table 1: Metrics—Teams Overview

Widget	Description
Good Call Rate	The percentage of good calls is calculated based on all peer-to-peer calls, including PSTN calls. The gauge is color-coded to indicate your rate of good calls compared to standard performance thresholds: • Green indicates that less than 5% of your total calls were unhealthy. • Orange indicates that 5% to 10% of your total calls were unhealthy. • Red indicates that more than 10% of your total calls were unhealthy.

Widget	Description
Good Conference Rate	The percentage of good meetings is calculated based on all conference calls, including calls made through the PSTN.
	The gauge is color-coded to indicate your rate of good calls compared to standard performance thresholds:
	• Green indicates that less than 5% of your total meetings were unhealthy.
	• Orange indicates that 5% to 10% of your total meetings were unhealthy.
	• Red indicates that more than 10% of your total meetings were unhealthy.
Good PSTN Call Rate	The percentage of good PSTN calls is calculated based on all direct routing, operator connect, and calling plan calls. This total includes peer-to-peer calls and conference calls made through the PSTN.
	The gauge is color-coded to indicate your rate of good calls compared to standard performance thresholds:
	• Green indicates that less than 5% of your total meetings were unhealthy.
	• Orange indicates that 5% to 10% to of your total meetings were unhealthy.
	• Red indicates that more than 10% of your total meetings were unhealthy.
Work Location	The chart shows the proportion of users who work remotely and the proportion of users who work in an office location. You can click the chart to filter the dashboard data based on the work location.
Volume of Calls	The bar graph shows the volume of calls according to call quality. You can click on the items in the legend to show or hide data according to the call quality.
	You can click on the **More Options** icon (three dots) in the top right of the widget and select **Download as CSV**.

Widget	Description
Calls by Location	This widget displays pins on a map to indicate where poor or failed calls occurred. A heat map around the pin indicates locations that had a higher volume of poor or failed calls.
	Poor calls and failed calls display by default, but you can use the **Layers** menu to show or hide data if you want to focus on a specific health state, such as failed calls. You can click on a pin to see the name of the user who experienced a poor or failed call. When the user information displays, you can click the arrow icon (>) and choose either **Go to Users Dashboard** or **Go to Locations Dashboard** to see more detailed information.
Top Affected Users	This table lists the users who were most affected by poor call quality, up to a maximum of 50. It summarizes the call type, connection type, and location information. To see data about a specific user on the Users Dashboard, hover over the user name and click the **Plus** (+) icon. Select **Go to Users Dashboard**.
	You can click the **Export** icon to download this data as a raw or formatted (CSV) file.
Top Affected Locations	This table lists the locations that were most affected by poor call quality, up to a maximum of 50. It summarizes the call type, connection type, and the IP address of the location where the poor call occurred; this is particularly helpful if you have more than one office in the same city.
	To see data about a specific location on the Locations Dashboard, hover over the location name and click the **Plus** (+) icon. Select **Go to Locations Dashboard**.
	You can click the **Export** icon to download this data as a raw or formatted (CSV) file.
Meeting Rooms Activity	This table lists active and inactive meeting rooms, up to a maximum of 50. The table is sorted by the meeting rooms that were most affected by poor call quality.
	To see detailed data about a specific meeting room, hover over the meeting room name and click the **Plus** (+) icon. Select **Go to Meeting Rooms Dashboard**.
	You can click the **Export** icon to download this data as a raw or formatted (CSV) file.

Users Dashboard

Use this dashboard to understand which users are experiencing poor and failed calls. You can also use this dashboard to understand whether CPU or memory usage on the desktop or mobile endpoint contributed to poor call quality; endpoint metrics are not available for web-based or Linux clients.

This dashboard includes data retrieved from the following:

- Microsoft Teams Call Quality Dashboard (CQD)
- VDX Diagnostics probes

If these items are not configured in your deployment, the widget displays the message "no results found."

The following table lists the performance metrics that are displayed on the Users Dashboard.

Table 2: Metrics—Users Dashboard

Widget	Description
Filter by User	Select one or more users whose data you want to review. To find a user, enter the user' email address in lowercase. If you do not select a specific user, the dashboard displays data for all users.
Good Call Rate	The widget displays the percentage of good calls. The gauge is color-coded to indicate your rate of good calls compared to standard performance thresholds: - Green indicates that less than 5% of your total calls were unhealthy. - Orange indicates that 5% to 10% of your total calls were unhealthy. - Red indicates that more than 10% of your total calls were unhealthy. The Good Call Rate is calculated based on all conference calls, peer-to-peer calls, and PSTN calls. The Total Calls and Average Call Rating display below the gauge. The Average Call Rating is the average score given by users at the end of a call. Users are prompted by Teams to rate call experience every 1 in 10 calls.
Work Location	This chart shows the proportion of users who work remotely and the proportion of users who work in an office location. You can click the chart to filter the dashboard data based on the work location.

Widget	Description
Volume of Calls	This widget displays the volume of calls for the selected user. The bars are color-coded to indicate the health state of the calls. To filter the dashboard based on a specific health state, click on the portion of the bar for that health state and then click **Apply**.
Call Segments	The total number of call segments for the selected time period. A segment represents a user in a call and is an aggregation of the call streams associated with a user. There is a single segment for each user.
Average Rating	The average rating of call quality provided by users. This information is based on the response of users who are prompted to rate their call quality at the end of a call.
Connection Types	A bar graph allows you to compare the number wired, WIFI, and mobile broadband connections. For WIFI connections, the graph indicates the WIFI band. The bars are color-coded to indicate the health state of the calls. To filter the dashboard based on a specific health state and connection type, click on the portion of the bar for that health state and connection type and then click **Apply**.
Call Types	A bar graph allows you to compare the number of conference calls and peer-to-peer calls. Calls made through the PSTN are included in these calculations. To filter the dashboard based on a specific health state and call type, click on the portion of the bar for that health state and call type and then click **Apply**.
PSTN Types	A bar graph allows you to compare the number of PSTN calls that were made using direct routing, operator connect, or a calling plan. The bars are color-coded to indicate the health state of the calls. To filter the dashboard based on a specific health state and PSTN call type, click on the portion of the bar for that health state and PSTN call type and then click **Apply**.
Teams Client	A bar graph displays the version of the Teams client, the number of calls made using that client, and whether the call was classified as good, poor, or failed.
Audio Devices	A bar graph displays the audio device that was used, such as the headset, speakerphone, or dongle. It displays the number of calls for each device and whether the call was classified as good, poor, or failed.

Widget	Description
Video Devices	A bar graph displays the video device that was used, such as an integrated camera or a webcam. It displays the number of calls for each device and whether the call was classified as good, poor, or failed.
Poor Reasons	A bar graph displays the number of occurrences of each reason for a poor call. For information about how calls are classified, see "Calculations for Poor Call Reasons" on page 25. The graph displays data for the users with the most poor call reasons, up to a maximum of 50 users.
ISPs	A bar graph lists the ISPs and shows the volume of good, poor, failed, and unclassified calls for each. Click on the name of an ISP and filter the data on the dashboard for that provider. You can click on the **More Options** icon (three dots) in the top right of the widget and select **Download as CSV**.
Call Ratings	A bar graph lists the users who provided call ratings, and the average rating given. Users who provided call ratings and the average rating. The graph displays up to 50 users, and is sorted from the lowest rating to the highest.

Widget	Description
Recent Calls	This table lists the most recent calls, up to a maximum of 50. It shows key call quality metrics, as well as endpoint metrics. When these metrics breach the following performance thresholds, the value is displayed in red: • Jitter: 30 ms • RTT: 500 ms • Packet loss: 10% • Teams CPU: 50% • System CPU: 80% • Teams Memory: 50% • System Memory: 80% The endpoint metrics are reported as average values to help you understand the general performance of the endpoint over time. If a call was poor or failed, the table also provides the reasons for the poor quality. You can click on the reason to view documentation that helps you troubleshoot and resolve issues. The documentation describes each reason, its threshold conditions, and possible root causes. If a user rates a call, their rating is also shown. The table also includes information such as the connection type, the transport protocol, the bandwidth, and the work location of the user. For WIFI calls, it shows the signal strength. The table displays Yes/No in the Network Switch column to indicate whether the network changed during the call. The Call ID corresponds to the Call ID shown in the Microsoft Teams Admin Center. You can click the **Export** icon to download this data as a raw or formatted (CSV) file. To see data about this call on the Calls Dashboard, hover over the Call ID and click the **Plus** (+) icon. Select **Go to Calls Dashboard**.

Widget	Description
Recent VDX Diagnostics Tests	This table lists the most recent network path tests conducted by the VDX Diagnostics probes. It includes the site group, the number of passed tests, and the number of failed tests, up to a maximum of 400 tests.
	There are two ways you can view test results directly from this widget, without the need to navigate to the VDX Diagnostics interface:
	- In the table, hover over a site and click the **Plus** (+) icon, then select **View Test Results**. The dashboard displays the test results and you can click on a result to view a network path diagram for that test. - In the **Latest Failure Result** column, click the **View Results** link to open the Path Analysis page for the failed test.
	You can click the **Export** icon to download this data as a raw or formatted (CSV) file.

Locations Dashboard

Use this dashboard to understand the locations and times when poor and failed calls occur. You can also use this dashboard to understand whether CPU or memory usage on the desktop or mobile endpoint contributed to poor call quality; endpoint metrics are not available for web-based or Linux clients.

This dashboard includes data retrieved from the following:

- Microsoft Teams Call Quality Dashboard (CQD)
- VDX Diagnostics probes
- Vantage DX Monitoring robots that are configured to test the Teams Advanced and Teams Video workloads.

If these items are not configured in your deployment, the widget displays the message "no results found."

The following table lists information about the widgets that are displayed on the Locations Dashboard.

Table 3: Metrics—Locations Dashboard

Widget	Description
Filter by Location	Select one or more locations for which you want to review data. If you do not select a specific location, the dashboard displays data for all locations.

Widget	Description
Filter by Office	Specify an office and filter the dashboard data based on that choice. This filter complements the Filter by Location drop-down, and is helpful if you have more than one office in the same city.
Good Call Rate	The widget displays the percentage of good calls. The gauge is color-coded to indicate your rate of good calls compared to standard performance thresholds: • Green indicates that less than 5% of your total calls were unhealthy. • Orange indicates that 5% to 10% of your total calls were unhealthy. • Red indicates that more than 10% of your total calls were unhealthy. The Good Call Rate is calculated based on all conference calls, peer-to-peer calls, and PSTN calls. The Total Calls and Average Call Rating display below the gauge. The Average Call Rating is the average score given by users at the end of a call. Users are prompted by Teams to rate call experience every 1 in 10 calls.
Work Location	The chart shows the proportion of users who work remotely and the proportion of users who work in an office location. You can click the chart to filter the dashboard data based on the work location.
Volume of Calls	This widget displays the volume of calls for the selected location. The bars are color-coded to indicate the health state of the calls. To filter the dashboard based on a specific health state, click on the portion of the bar for that health state and then click **Apply**.
Connection Types	A bar graph allows you to compare the number wired, WIFI, and mobile broadband connections. For WIFI connections, the graph indicates the WIFI band. The bars are color-coded to indicate the health state of the calls.
Call Types	A bar graph allows you to compare the number of conference calls and peer-to-peer calls. Calls made through the PSTN are included in these calculations.

Widget	Description
PSTN Types	A bar graph allows you to compare the number of PSTN calls that were made using direct routing, operator connect, or a calling plan. The bars are color-coded to indicate the health state of the calls.
Teams Client	A bar graph displays the version of the Teams client, the number of calls made using that client, and whether the call was classified as good, poor, or failed.
Audio Devices	A bar graph displays the audio device that was used, such as the headset, speakerphone, or dongle. It displays the number of calls for each device and whether the call was classified as good, poor, or failed.
Video Devices	A bar graph displays the video device that was used, such as an integrated camera or a webcam. It displays the number of calls for each device and whether the call was classified as good, poor, or failed.
ISPs	A bar graph lists the ISPs and shows the volume of good, poor, failed, and unclassified calls for each. Click on the name of an ISP and filter the data on the dashboard for that provider. You can click on the **More Options** icon (three dots) in the top right of the widget and select **Download as CSV**.
Poor Reasons	This bar chart displays the number of occurrences of poor calls for each office, as well as the reason why the call was classified as poor. For information about how calls are classified, see "Calculations for Poor Call Reasons" on page 25. The chart displays information for up to a maximum of 50 offices.

Widget	Description
Top Users	This table lists the users who participated in the most calls at the selected location, up to a maximum of 50 users. It allows you to see the call quality experienced by the user, as well connection details. The table also indicates whether the user worked remotely or in an office.
	If a call was poor or failed, the table also provides the reasons for the poor quality. You can click on the reason to view documentation that helps you troubleshoot and resolve issues. The documentation describes each reason, its threshold conditions, and possible root causes.
	You can click the **Export** icon to download this data as a raw or formatted (CSV) file. To see data about this call on the User Dashboard, hover over the Call ID and click the **Plus** (+) icon. Select **Go to Users Dashboard**.
Recent VDX Diagnostics Tests	This table lists the most recent network path tests conducted by the VDX Diagnostics probes. It includes the site group, the number of passed tests, and the number of failed tests, up to a maximum of 400 tests.
	There are two ways you can view test results directly from this widget, without the need to navigate to the VDX Diagnostics interface: - In the table, hover over a site and click the **Plus** (+) icon, then select **View Test Results**. The dashboard displays the test results and you can click on a result to view a network path diagram for that test. - In the **Latest Failure Result** column, click the **View Results** link to open the Path Analysis page for the failed test.
	You can click the **Export** icon to download this data as a raw or formatted (CSV) file.
Time per Action—Vantage DX Monitoring	When you configure Vantage DX Monitoring robots to test Teams Advanced and Teams Video workloads, this widget displays the number of milliseconds (ms) required to perform typical user actions. The recommended time for these actions is less than 6000 ms. Vantage DX Monitoring raises a warning when these actions exceed the 6000 ms threshold, and a critical notification when these actions exceed a 9000 ms threshold. The 6000 ms threshold is shown on the graph for comparison; it displays only if the actions exceed the threshold.

Widget	Description
Mean Opinion Score— Vantage DX Monitoring	This widget displays the average Mean Opinion Score (MOS). MOS is a prediction of end-user audio quality experience based on latency, the packet loss, jitter, and the codec used. A score of 1.0 represents the lowest quality, and a score of 5.0 represents the highest quality. A threshold of 4.0 is shown on the graph; scores below this threshold indicate that some users experienced poor call quality.
Video Frame Rate— Vantage DX Monitoring	This widget displays the average video frame rate per second for outbound Teams video streams. The graph shows a threshold of 7 frames per second; frame rates below this threshold can cause critical issues with video call quality.
Video Packet Loss— Vantage DX Monitoring	The number of video packets lost in a 30-second interval, after error correction has been applied. For example, if 1000 packets are sent in a 30-second interval and 50 are lost, the packet loss rate is 5%. Microsoft recommends a packet loss rate of less than 15% during a 30-second interval, and this threshold is shown on the graph. A rate of more than 15% severely impacts the call quality.
Jitter— Vantage DX Monitoring	This graph displays the average jitter as measured by the Vantage DX Monitoring robots at the selected location. Jitter is the size of the buffer that is needed to store packets before they are reconstructed in the correct order. The value is calculated over a 15-second period. A low jitter number means that the call connection is good. A large jitter value can cause delay in calls and indicates congestion of the network. The performance threshold for jitter is 30 ms.
Round-Trip Time— Vantage DX Monitoring	This graph displays the average round trip time (RTT) as measured by the Vantage DX Monitoring robots at the selected location. RTT is the time in milliseconds that it takes a data packet to travel from point A to B and return. It is determined by the physical distance between the two points, the speed of transmission, and the overhead taken by the routers in between. The performance threshold for RTT is 500 ms.

Widget	Description
Packet Loss— Vantage DX Monitoring	This graph displays the average percentage of audio packets lost, as measured by the Vantage DX Monitoring robots at the selected location.
	Packet loss is measured in 15-second intervals. For example, if 1000 packets are sent in a 15-second interval and 50 are lost, the packet loss rate is 5%.
	Microsoft recommends a packet loss rate of 1% during a 15-second interval, and this threshold is shown on the graph. A packet loss rate between 3% and 7% causes a noticeable impact to call quality. A rate of more than 7% severely impacts the call quality.

Calls Dashboard

Use this dashboard to understand the causes of poor and failed calls by reviewing audio, video and screen-sharing data. You can also use this dashboard to understand whether CPU or memory usage on the desktop or mobile endpoint contributed to poor call quality; endpoint metrics are not available for web-based or Linux clients.

This dashboard includes data retrieved from the following:

- Microsoft Teams Call Quality Dashboard (CQD)
- AudioCodes Session Border Controllers (SBCs) versions 7.2 and 7.4

If these items are not configured in your deployment, the widget displays the message "no results found."

> **Note:**
> You can navigate to the Calls Dashboard from the Users Dashboard. On the Users Dashboard, click on a Call ID and select **Go to Calls Dashboard** to see detailed information about the selected call. This navigation allows you to view data that is pre-filtered to provide details about a specific Call ID. You can clear the filter on the Calls Dashboard if you want to view data for more than one Call ID.

Table 4: Metrics—Calls Dashboard

Widget	Description
Recent Calls	This table lists the most recent calls and shows key call quality metrics, as well as endpoint metrics. Average values are shown, based on all users who participated in the call. When these metrics breach the following performance thresholds, the value is displayed in red:

- Jitter: 30 ms
- RTT: 500 ms
- Packet loss: 10%
- Average Teams CPU: 50%
- Average System CPU: 80%
- Average Teams Memory: 50%
- Average System Memory: 80%

If a call was poor or failed, the table also provides the reasons for the poor quality. You can click on the reason to view documentation that helps you troubleshoot and resolve issues. The documentation describes each reason, its threshold conditions, and possible root causes.

The table also includes information about conditions that affect call quality, such as the connection type, the transport protocol, and the bandwidth. For WIFI calls, it shows the signal strength. The table also indicates the percentage of users in a call who were remote and the percentage who participated from an office. If any call participants were in an office, the office location is displayed. The table displays Yes/No in the Network Switch column to indicate whether the network changed during the call.

The Call ID shown corresponds to the Call ID shown in the Microsoft Teams Admin Center.

By default, this table lists information about the call that you selected on the Users Dashboard. To see details for a different call, click the **X** in the **Add Filter** field to clear the call filter, and then select a new call. To select a call, hover over the Call ID and click the **Plus** (+) icon. To see all calls, remove all filters.

You can click the **Export** icon to download this data as a raw or formatted (CSV) file.

Widget	Description
Call Ratings	A bar graph lists the users who provided call ratings, and the average rating given. Users who provided call ratings and the average rating. The graph displays up to 50 users, and is sorted from the lowest rating to the highest.
Inbound Audio — Stream(s) Details	This widget lists details of inbound audio streams that experienced poor call quality. If you selected a specific call to filter the data on the dashboard, the widget lists all of the inbound audio streams that are related to that call, including streams with good call quality. The table provides call quality metrics such as jitter, round-trip time, packet loss, and the minimum and average MOS. It also provides endpoint metrics, such as memory and CPU usage for Teams and for the system. If the metrics are below standard performance thresholds, the value is displayed in red. The table also provides details such as the connection type, the call type, the audio device type, the transport protocol, the bandwidth, and more. For WIFI calls, the table lists the signal strength. The table also indicates the work location. You can click the **Export** icon to download this data as a raw or formatted (CSV) file.
Outbound Audio — Stream(s) Details	This widget lists details of outbound audio streams that experienced poor call quality. If you selected a specific call to filter the data on the dashboard, the widget lists all of the outbound audio streams that are related to that call, including streams with good call quality. The table provides call quality metrics such as jitter, round-trip time, packet loss, and the minimum and average MOS. It also provides endpoint metrics, such as memory and CPU usage for Teams and for the system. If the metrics are below standard performance thresholds, the value is displayed in red. The table also provides details such as the connection type, the call type, the audio device type, the transport protocol, the bandwidth, and more. For WIFI calls, the table lists the signal strength. The table also indicates the work location. You can click the **Export** icon to download this data as a raw or formatted (CSV) file.

Widget	Description
Inbound Video and Screen Sharing — Problematic Stream(s) Details	This widget displays data only when you select a specific call to filter the information on the dashboard.
	The table lists details of the inbound video streams that experienced problems. It lists call quality metrics such as jitter, round-trip time, packet loss, and the minimum and average MOS. It also provides endpoint metrics, such as memory and CPU usage for Teams and for the system. If the metrics are below standard performance thresholds, the value is displayed in red. The table also provides details such as the stream type, the reasons for the poor quality, the connection type, information about the video device, the transport protocol, the bandwidth, the location, and more.
Outbound Video and Screen Sharing — Problematic Stream(s) Details	This widget displays data only when you select a specific call to filter the information on the dashboard.
	The table lists details of the outbound video streams that experienced problems. It lists call quality metrics such as jitter, round-trip time, packet loss, and the minimum and average MOS. It also provides endpoint metrics, such as memory and CPU usage for Teams and for the system. If the metrics are below standard performance thresholds, the value is displayed in red. The table also provides details such as the stream type, the reasons for the poor quality, the connection type, information about the video device, the transport protocol, the bandwidth, the location, and more.
Mean Opinion Score — AudioCodes SBC	This widget displays an average MOS that is calculated based on packet loss, round trip, jitter, and the codec used. The chart is segmented into three areas, according to the destination of the stream: PSTN, SBC, or Teams. The bars are color-coded to indicate the source of the stream. You can hover over each bar for more information about the stream. Click the **Legend** icon to see the meaning of each color.
	The chart shows data for the selected time period, rather than for a selected call.

Widget	Description
Jitter — AudioCodes SBC	Jitter is the size of the buffer that is needed to store packets before they are reconstructed in the correct order. The value is calculated over a 15-second period. A low jitter number means that the call connection is good. A large jitter value can cause delay in calls and indicates congestion of the network. The chart is segmented into three areas, according to the destination of the stream: PSTN, SBC, or Teams. The bars are color-coded to indicate the source of the stream. You can hover over each bar for more information about the stream. Click the **Legend** icon to see the meaning of each color. The chart shows data for the selected time period, rather than for a selected call.
Round-Trip Time — AudioCodes SBC	Round trip time (RTT) is the time in milliseconds that it takes a data packet to travel from point A to B and return. It is determined by the physical distance between the two points, the speed of transmission, and the overhead taken by the routers in between. The chart is segmented into three areas, according to the destination of the stream: PSTN, SBC, or Teams. The bars are color-coded to indicate the source of the stream. You can hover over each bar for more information about the stream. Click the **Legend** icon to see the meaning of each color. The chart shows data for the selected time period, rather than for a selected call.
Packet Loss — AudioCodes SBC	The number of audio packets lost in a 15-second interval. For example, if 1000 packets are sent in a 15-second interval and 50 are lost, the packet loss rate is 5%. Microsoft recommends a packet loss rate of 1% during a 15-second interval. A packet loss rate between 3% and 7% causes a noticeable impact to call quality. A rate of more than 7% severely impacts the call quality. The chart is segmented into three areas, according to the destination of the stream: PSTN, SBC, or Teams. The bars are color-coded to indicate the source of the stream. You can hover over each bar for more information about the stream. Click the **Legend** icon to see the meaning of each color. The chart shows data for the selected time period, rather than for a selected call.

Widget	Description
Active Calls In/Out — AudioCodes SBC	This widget shows the maximum and average number of active calls, both inbound and outbound. The chart shows data for the selected time period, rather than for a selected call. This data is available for AudioCodes SBCs version 7.4 and higher.
Established & Not Established Calls In/Out — AudioCodes SBC	This widget shows the total number of inbound and outbound calls that were established, not established, or that failed. The chart shows data for the selected time period, rather than for a selected call. This data is available for AudioCodes SBCs version 7.4 and higher.
Network Effectiveness & Answer Seizure Ratios — AudioCodes SBC	Network effectiveness is a measure of the network's ability to deliver calls to the far endpoint. The answer seizure ration is the percentage of calls that were answered. The chart shows data for the selected time period, rather than for a selected call. There must be a minimum of 10 calls during the selected time period selected for data to display in this widget. This data is available for AudioCodes SBCs version 7.4 and higher.
Memory & CPU — AudioCodes SBC	This widget shows the maximum and average use of CPU and memory for the selected time period. The chart shows data for the selected time period, rather than for a selected call. This data is available for AudioCodes SBCs version 7.4 and higher.
SIP Transaction Rate — AudioCodes SBC	This widget shows the maximum and average SIP transaction rate, which measures how many SIP messages the SBC is processing. Spikes in this value may indicate that there are difficulties with the call setup, causing the SBC to retry the setup of multiple calls. The chart shows data for the selected time period, rather than for a selected call. This data is available for AudioCodes SBCs version 7.4 and higher.

Meeting Rooms Dashboard

Use this dashboard to understand the performance of your Teams meeting rooms, and the health state of each.

This dashboard includes data retrieved from the following:

- Microsoft Teams Call Quality Dashboard (CQD)
- Microsoft 365

The following table lists the performance metrics that are displayed on the Meeting Rooms dashboard.

Table 5: Metrics—Meeting Rooms Dashboard

Widget	Description
Filter by Meeting Room	Select one or more meeting rooms for which you want to review data. If you do not select a specific meeting room, the dashboard displays data for all meeting rooms.
Good Call Rate	The percentage of good calls is calculated based on all conference calls and peer-to-peer calls, including PSTN calls. The gauge is color-coded to indicate your rate of good calls compared to standard performance thresholds: • Green indicates that less than 5% of your total calls were unhealthy. • Orange indicates that 5% to 10% of your total calls were unhealthy. • Red indicates that more than 10% of your total calls were unhealthy.
Volume of Calls	The bar graph shows the volume of calls according to call quality. You can click on the items in the legend to show or hide data according to the call quality.
Total Devices	The number of devices associated with the meeting room.
Offline Devices	The number of associated devices that are offline.
Healthy Devices	The number of associated devices that are healthy. This health state is calculated by Microsoft and depends on settings in your Teams Admin Center, which allows customization of some device types.

Widget	Description
Non-Urgent Devices	The number of associated devices that have non-urgent issues. This health state is calculated by Microsoft and depends on settings in your Teams Admin Center, which allows customization of some device types. For example, the health state of a device becomes non-urgent by default when a software update is required, but this may be configurable for your device. The health state shown here depends on your configuration.
Critical Devices	The number of associated devices that have critical issues. This health state is calculated by Microsoft and depends on settings in your Teams Admin Center, which allows customization of some device types. For example, the health state of a device becomes critical by default when it is disconnected, but this may be configurable for your device. The health state shown here depends on your configuration.
Connection Types	A bar graph allows you to compare the number wired, WIFI, and mobile broadband connections. The bars are color-coded to indicate the health state of the calls. To filter the dashboard based on a specific health state and connection type, click on the portion of the bar for that health state and connection type and then click **Apply**.
Call Type	A bar graph allows you to compare the number of conference calls and peer-to-peer calls. Calls made through the PSTN are included in these calculations. To filter the dashboard based on a specific health state and call type, click on the portion of the bar for that health state and call type and then click **Apply**.
PSTN Call Type	A bar graph allows you to compare the number of PSTN calls that were made using direct routing, operator connect, or a calling plan. The bars are color-coded to indicate the health state of the calls. To filter the dashboard based on a specific health state and PSTN call type, click on the portion of the bar for that health state and PSTN call type and then click **Apply**.
ISPs	A bar graph lists the ISPs and shows the volume of good, poor, failed, and unclassified calls for each. Click on the name of an ISP and filter the data on the dashboard for that provider.

Widget	Description
Meeting Rooms by Location	This widget displays pins on a map to indicate where poor or failed calls occurred. A heat map around the pin indicates locations that had a higher volume of poor or failed calls.
	Poor calls and failed calls display by default, but you can use the **Layers** menu to show or hide data if you want to focus on a specific health state, such as failed calls. You can click on a pin to see the name of the meeting room where a poor or failed call occurred, as well as its location information. When the meeting room information displays, you can click the arrow icon (>) and choose **Go to Locations Dashboard** to see more detailed information.
Recent Calls	This table lists the most recent calls, up to a maximum of 50. It shows the call quality experienced on recent calls associated with the meeting room. When these metrics breach the following performance thresholds, the value is displayed in red: • Jitter: 30 ms • RTT: 500 ms • Packet loss: 10% If a call was poor or failed, the table also provides the reasons for the poor quality. You can click on the reason to view documentation that helps you troubleshoot and resolve issues. The documentation describes each reason, its threshold conditions, and possible root causes. The table also includes information such as the connection type, the transport protocol, the bandwidth, and the work location of the user. For WIFI calls, it shows the signal strength. If a user rates a call, their rating is also shown. The Call ID corresponds to the Call ID shown in the Microsoft Teams Admin Center. You can click the **Export** icon to download this data as a raw or formatted (CSV) file. To see data about this call on the Calls Dashboard, hover over the Call ID and click the **Plus (+)** icon. Select **Go to Calls Dashboard**.
Device Information	This table lists the devices with the most recent activity, up to a maximum of 50. It shows the last activity and the last health state of the device. You can click the **Export** icon to download this data as a raw or formatted (CSV) file. To see data about this device on the Meeting Room Devices Dashboard, hover over the device and click the **Plus (+)** icon. Select **Go to Meeting Room Devices Dashboard**.

Meeting Room Devices Dashboard

Use this dashboard to understand the health state of your meeting room devices.

This dashboard includes data retrieved from the following:

- Microsoft Teams Call Quality Dashboard (CQD)
- Microsoft 365

Note:
You can navigate to the Meeting Room Devices Dashboard from the Meeting Rooms Dashboard. On the Meeting Rooms Dashboard, click on a meeting room and select **Go to Meeting Room Devices Dashboard** to see detailed information about the devices associated with the selected meeting room. This navigation allows you to view data that is pre-filtered to provide device details for a specific meeting room. You can clear the filter on the dashboard if you want to view device data for more than one meeting room.

Table 6: Metrics—Meeting Room Devices Dashboard

Widget	Description
Meeting Room	When you access this dashboard, the data is filtered based on the device that you chose on the Meeting Rooms dashboard. You can use this drop-down to filter by meeting room.
Health Status	Use this drop-down list to filter the data based on the health state of the device.
Meeting Room Devices	This table lists information about the device, such as the most recent activity, last health status, manufacturer, model, serial number, and the associated meeting room.

Widget	Description
Admin Agent Software	These tables list the status of software on the device. The software status is color-coded as follows to indicate the status:
Teams Client Software	
Operating System Software	• Green—latest version • Amber—update available
Company Portal Software	
Firmware Software	
Partner Agent Software	

Teams Phone Licenses Dashboard

Use this dashboard to understand how your Teams Phone licenses are being used in your organization.

> **Note:**
> This dashboard is available in the Professional and Enterprise license packages.

The following table lists information about the widgets that are displayed on the dashboard.

Table 7: Metrics—Teams Phone Licenses Dashboard

Widget	Description
Filter by User	Select one or more users from the list. The list displays only those users who have a Teams Phone license assigned to them. If you do not select a specific user, the dashboard displays data for all users.

Widget	Description
Filter by Department	Specify a department and filter the dashboard data based on that choice. The list displays only those departments that have Teams Phone licenses assigned to them. If you do not select a specific department, the dashboard displays data for all departments with assigned licenses.
Total Purchased Licenses	The total number of Teams Phone licenses purchased by your organization.
Total Assigned Licenses	The total number of Teams Phone licenses assigned to users in your organization.
Unused Licenses	The number of Teams Phone licenses that were not used within the past 7 days.
Unused Licenses by Department	The chart shows the proportion of unused licenses for each department within the past 7 days. It shows information for up to 50 departments. You can click the chart to filter the dashboard data based on the department.
Total Calls	The total number of PSTN calls made using Teams Phone licenses.
Volume of Calls	The bar graph shows the number of PSTN calls by date and time.
Teams Phone Licenses	This table lists the license name, the service plan, and the number of licenses purchased for each plan, as well as status information. It shows information for up to 50 licenses. You can click the **Export** icon to download this data as a raw or formatted (CSV) file.
Teams Phone License Usage	This table lists information about the users who have Teams Phone licenses, and shows the number of calls, the call duration, and latest call time for each. You can click the **Export** icon to download this data as a raw or formatted (CSV) file.

Dashboards for Proactive Monitoring

The **Proactive Monitoring** menu provides access to dashboards that contain test results from Vantage DX Monitoring robots. These dashboards help you proactively monitor metrics that are predictors of call quality, as well as metrics that show the availability of tools that you rely on for productivity.

Access to the dashboards is role-based. By default, only administrators can view the dashboards. Users in other roles can view the dashboards only if an administrator has assigned access to them. For information about how to assign dashboards to roles, see the *Vantage DX Deployment Guide*.

The following section describes the dashboard:

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Teams Dashboard

Use this dashboard to view the results of tests performed by Vantage DX Monitoring robots for the Teams Advanced and Teams Video workloads.

This dashboard is available with Enterprise and Professional licenses, and you must have configured monitoring for the Teams Advanced and Teams Video workloads in Vantage DX Monitoring. If these workloads are not configured in your deployment, the related widget displays the message "no results found."

The following table lists the performance metrics that are displayed on the Teams Dashboard.

Table 8: Metrics—Teams Dashboard

Widget	Description
Filter by Robot Manager	Specify a Robot Manager to filter the dashboard data based on that choice.

Widget	Description
Performance	This gauge provides a quick status of the health of your Teams Advanced and Teams Video workloads.
	For each workload, the robots perform a set of tests at regular intervals. This gauge is based on the number of times that tests were performed during the selected time period, and the number of times that tests failed or anomalies were detected.
	• Green indicates that problems were detected in less than 2% of the tests. • Orange indicates that problems were detected in up to 5% of the tests. • Red indicates that problems were detected in more than 5% of the tests.
	If you filter the dashboard to show data about a specific Robot Manager, the gauge shows the performance of the workloads configured on that Robot Manager. If you do not filter the dashboard, the gauge displays an average for Teams Advanced and Teams Video workloads that are deployed on all Robot Managers in your environment.

Widget	Description
Latest Robot Manager Health by Workload	This table provides information about the robots that are installed in your environment and indicates whether they are monitoring the Teams Advanced or Teams Video workloads. It displays the name of the Robot Manager and location where it is installed, as well the health state of: • The Robot Manager, which is deployed on a dedicated machine in your environment; the health state indicates whether the Robot Manager service is sending heartbeats at the expected intervals. • The health state of the robots that are testing your workloads; the health state is based on whether the robots are performing workload tests at the expected frequency. • The workloads being tested; the health state is based on a comparison between the test results and industry-standard performance thresholds. The table lists information for up to 50 workloads. To see more data about the location where the Robot Manager is deployed, hover over the Location and click the **Plus (+)** icon. Select **Go to Locations Dashboard**. Use the **View Details** link to navigate to the component that represents the Robot Manager. From the component, you can click the **Alerts** tab to view any related alerts, or click the **Explorer** tab to view the Robot Manager in relation to other components in your environment.
Average Execution Time per Metric	This chart displays the average time required for robots to perform tasks that your users commonly perform, such as connecting to Teams, posting messages, downloading files, and more. You can click on items in the legend to show or hide them on the chart.
Warning by Configuration	This table displays the percentage of warnings that occurred for the Teams Advanced and Teams Video workloads at each site. To see more data about the location where the Robot Manager is deployed, hover over the Location and click the **Plus (+)** icon. Select **Go to Locations Dashboard**. The table displays up to 50 workload configurations.

Widget	Description
Worst Performing Metrics	This table displays the tasks the robots performed which had the worst performance results.
	To see more data about the location where the Robot Manager is deployed, hover over the Location and click the **Plus (+)** icon. Select **Go to Locations Dashboard**.
	The table displays up to 50 tasks.
Average Mean Opinion Score per Robot Manager	This chart shows the average Mean Opinion Score (MOS) for the Teams Advanced and Teams Video workloads, organized by Robot Manager; this allows you to quickly understand the average MOS score for each of your business sites. MOS is valuable because it is a prediction of end-user audio quality experience. It is based on latency, the packet loss, jitter, and the codec used. The performance threshold for MOS is 4.0.
	The chart displays information for up to 12 Robot Managers. You can click on items in the legend to show or hide them on the chart.
Average RoundTrip per Robot Manager	This chart shows the average Round Trip Time (RTT) for Teams calls at each location where a Robot Manager is deployed.
	RTT is the time in milliseconds that it takes a data packet to travel from point A to B and return. It is determined by the physical distance between the two points, the speed of transmission, and the overhead taken by the routers in between. The performance threshold for RTT is 500 ms.
	The chart displays information for up to 12 Robot Managers. You can click on items in the legend to show or hide them on the chart.
Average Jitter per Robot Manager	This chart shows the average jitter for Teams calls at each location where a Robot Manager is deployed.
	Jitter is the size of the buffer that is needed to store packets before they are reconstructed in the correct order. The value is calculated over a 15-second period. A low jitter number means that the call connection is good. A large jitter value can cause delay in calls and indicates congestion of the network. The performance threshold is 30 ms.
	The chart displays information for up to 12 Robot Managers. You can click on items in the legend to show or hide them on the chart.

Widget	Description
Average Audio Packet Loss per Robot Manager	This chart shows the average audio packet loss for Teams calls at each location where a Robot Manager is deployed.
	Packet loss is measured in 15-second intervals. For example, if 1000 packets are sent in a 15-second interval and 50 are lost, the packet loss rate is 5%. Microsoft recommends a packet loss rate of 1% during a 15-second interval
	The chart displays information for up to 12 Robot Managers. You can click on items in the legend to show or hide them on the chart.
Average Video Frame Rate per Robot Manager	This chart shows the average number of frames per received for video streams at each location where a Robot Manager is deployed. Video sessions in Teams include screen sharing and application sharing. The performance threshold is 7 fps.
	The chart displays information for up to 12 Robot Managers.
Average Video Packet Loss per Robot Manager	This chart shows the average video packet loss for Teams calls at each location where a Robot Manager is deployed.
	Video packet loss is measured in a 30-second intervals, after error correction has been applied. For example, if 1000 packets are sent in a 30-second interval and 50 are lost, the packet loss rate is 5%. Microsoft recommends a packet loss rate of less than 15% during a 30-second interval.
	The chart displays information for up to 12 Robot Managers.

Components

In addition to the default dashboards, VDX Analytics creates components that represent data it has retrieved from the source systems it is integrated with. For example, components represent data such as Microsoft licenses, Teams meeting rooms, or Teams calls. There are also components to represent synthetic transaction and network path tests.

These components are a helpful addition to the dashboards because you can pin them to boards or business services to model your data in the way that best suits your needs.

Each source system—also called an integration—uses its own terminology to describe the components it monitors. VDX Analytics standardizes this terminology so that it is easy to correlate data from a variety of source systems. The tables in the following sections list the components that VDX Analytics creates when it retrieves data from your Microsoft tenant and from the Vantage DX modules. The tables also describe how the health state of the component is calculated.

Microsoft CQD Components

The following sections describe the components that VDX Analytics creates for data it retrieves from the Microsoft Call Quality Dashboard (CQD), and how the integration settings impact the health state calculations.

Components and Health State Calculations

The following table lists the component types that VDX Analytics creates for data it retrieves from the Microsoft Call Quality Dashboard (CQD). The table also describes how the health state of each component is calculated.

Table 9: Microsoft CQD Data

Component	Description
Objects	
Users	VDX Analytics provides information about the status of the user, such as its health state, the amount of uptime, and the number of incidents and alerts.
	The overall health state of a user is based on the worst-case health state of the user's devices.
User Devices	This object provides information about a user's experience from a specific location and network connection type. It is based on the geographical location of the device, the network connection type, the operating system, and the IP address. Because this object is based on multiple properties, VDX Analytics may display more than one object for each device. For example, if a user receives a Teams call on a mobile device over broadband while that device is also connected to WIFI in the office or at home, VDX Analytics creates two objects: one for the mobile connection and one for the WIFI connection.
	If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the user device is shown as healthy. This approach prevents a device from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Critical Ratio (%)** field.
Groups	

Component	Description
Geographical locations	Cities and countries display as groups. These groups are based on the location of user devices. VDX Analytics provides information about the status of the location, such as its health state, the amount of uptime, and the number of incidents and alerts.
	The health state is based on the call quality experienced by all the user devices contained in the group.
	If the average number of calls per user device is lower than the number of devices in the group, the group is shown as healthy. This approach prevents a group from showing a critical health state based on very few calls. For example, if a group contains 5 user devices, but the average number of calls per device is 2, poor quality calls will not trigger a critical health state.
	• **Warning state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Warning Ratio (%)** field.
	• **Critical state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Critical Ratio (%)** field.
ISPs	ISPs display as groups. The ISP group is based on the service provider information for user devices. VDX Analytics provides information about the status of the service provider, such as its health state, the amount of uptime, and the number of incidents and alerts.
	The health state is based on the call quality experienced by all the user devices contained in the group.
	If the average number of calls per user device is lower than the number of devices in the group, the group is shown as healthy. This approach prevents a group from showing a critical health state based on very few calls. For example, if a group contains 5 user devices, but the average number of calls per device is 2, poor quality calls will not trigger a critical health state.
	• **Warning state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Warning Ratio (%)** field.
	• **Critical state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Critical Ratio (%)** field.

Component	Description
Conference Calls/ Meetings	Teams conference calls display as groups. The groups contain all of the user devices that were part of that meeting. You can view the group properties to see which users experienced poor call quality. The health state is calculated based on the percentage of poor and dropped calls during that meeting. • **Warning state:** Occurs if one attendee experiences a poor or dropped call. • **Critical state:** Occurs if multiple attendees experience a poor or dropped call.
Dynamic Offices	A dynamic office is when three or more user devices participate in a call using the same IP address. VDX Analytics creates a group for that IP address. The health state is based on the call quality experienced by all the user devices contained in the group. If the average number of calls per user device is lower than the number of devices in the group, the group is shown as healthy. This approach prevents a group from showing a critical health state based on very few calls. For example, if a group contains 5 user devices, but the average number of calls per device is 2, poor quality calls will not trigger a critical health state. • **Warning state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls is higher than the value set in the **Poor Call Critical Ratio (%)** field.

Component	Description
TCP Calls	TCP call groups display all the users that make and receive TCP calls. These groups are based on calls. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.
Near Time Calls	These groups aggregate metrics for calls that occurred within the last two hours. These groups are based on calls. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.

Component	Description
Network Switching	These groups aggregate information about calls where one of the endpoints experienced a change in the network connection. For example, if a call participant changed from a WIFI connection to a cell connection during the call, that call is included in the Network Switching group. Network switching can also occur if a call participant switches between WIFI base stations, or if a call disconnects and reconnects. Network switching can cause poor call quality by affecting RTT, jitter, or packet loss. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.
Low MOS	This groups aggregate data about calls that had low MOS scores. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.

Component	Description
Poor Wifi Strength	These groups aggregate data about calls that had poor WIFI connections. These groups are based on calls. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.
Low Client Bandwidth	These groups aggregate data about calls that experienced low bandwidth. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.

Component	Description
Microsoft Data Center	When a Teams call is initiated, the location of the server that hosts the call is typically determined by the first user to join the call. The call is hosted by the Microsoft data center that is in the same region as the first user. VDX Analytics creates a group for each data center and displays the users who participated in calls hosted by that data center. Call quality metrics are aggregated for each group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.
PSTN Trunk	These groups display information about user devices that are associated with direct routing calls. Call quality metrics are aggregated for the group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.

Component	Description
PSTN Carrier	These groups display information about user devices that are associated with calling plan calls. Call quality metrics are aggregated for the group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.
PSTN Operator Connect	These groups display information about user devices that are associated with operator connect calls. Call quality metrics are aggregated for the group, and the health state is based on the aggregated data. If the total number of calls during the look back period is 2 or less, or if there is not more than 1 call with poor quality, the group is shown as healthy. This approach prevents a group from showing a critical health state based on one poor call. • **Warning state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Warning Ratio (%)** field. • **Critical state:** Occurs when the percentage of poor or dropped calls for the group is higher than the value set in the **Poor Call Critical Ratio (%)** field.
Call rating information	The Call Rating is the score that users provide when they are prompted to rate the quality of a Teams call. The score is on a scale of 1 to 5 and it is optional for users to provide this rating. You can use this group to see which users are rating calls most frequently and how they are rating their experience. When you view the Raw Properties for the group, the Group Type is listed as CallRating.

> **Note:**
> If the IP address of a device changes during the data collection period, VDX Analytics creates a new device. In this version, you may see multiple instances of the same device if the IP address of a device is changed.

Configuration Options

When you configure the integration, there are some key settings that affect how health states are calculated:

- There are two settings that determine the time period used to calculate health states:
  - **Health Status Period**—The number of hours used to calculate the health status of objects. By default, this field is set to 48 hours; however, you can edit this value if you want to calculate the health status over a different period of time.
  - **Data Retrieval Period**—The number of days of data from the CQD to display in VDX Analytics. The default setting varies from 4 to 28 days, depending on the tenant size selected for the integration. This field is not directly related to the health state calculations, but it does work in conjunction with the **Health Status Period** field. If the value in the **Health Status Period** is 0, Vantage DX Analytics uses the value in the **Data Retrieval Period** field.
  - Use these fields together to specify the data collection window and the health state calculations. For example, you can calculate the health status based on the past 24 hours but continue to display call quality data for the last 7 days.
- **Poor Call Warning Ratio (%)**—The threshold used by VDX Analytics to trigger a warning about the health status of a component. Use this field to specify the percentage of poor calls that must occur during the time period used to calculate health status. The time period is set in the **Health Status Period** field. By default, the call warning ratio is 20%. This default value is used if the setting is 0.
- **Poor Call Critical Ratio (%)**—The threshold used by VDX Analytics to trigger a critical alert about the health status of a component. Use this field to specify the percentage of poor calls that must occur during the time period used to calculate health status. The time period is set in the **Health Status Period** field. By default, the call critical ratio is 30%. This default value is used if the setting is 0.

Microsoft 365 Components

The following table lists the component types that VDX Analytics creates based on data it retrieves about your Microsoft 365 services. The table also describes how the health state of each component is calculated.

Table 10: Service data from Microsoft 365

Component	Description
Object	
License	This object component corresponds to applications that are included in a Microsoft 365 Enterprise or Microsoft 365 Frontline license, such as Visio Online or Exchange Online. It provides information about the service plans for the license, as well as the number of purchased and active licenses.
	The health states of Microsoft 365 licenses are calculated as follows:
	• **Critical:** 0 licenses are available
	• **Warning:** Fewer than 2 licenses are available, or if you have more than 20 pre-paid licenses, fewer than 5 are available.
Teams Meeting Room	VDX Analytics creates an object component for each Teams meeting room configured in your tenant. The component provides license and service plan information, as well as location and number of seats.
	The health state of a Microsoft Teams meeting room is displayed based on the device health status of the room's devices, as follows:
	• **Critical:** An issue is causing a significant performance impact on the device, or the device may be unusable.
	• **Warning:** An issue may have a limited impact on the device, or the device may be offline.
Device	This object component corresponds to devices used in meeting rooms, such as a collaboration bar, a phone, or a touch console. Objects may also be low-cost phones, IP phones, and SIP phones.
	The health state of meeting room devices is determined as follows:
	• **Critical:** An issue is causing a significant performance impact on the device, or the device may be unusable.
	• **Warning:** An issue may have a limited impact on the device, or the device may be offline.

Component	Description
Group	
Microsoft 365 Subscription	Licensed applications are aggregated into a group component. This component lists all of the licensed applications in your Microsoft 365 subscription and provides information about the number of purchased and available licenses. The health states of Microsoft 365 licenses are calculated as follows: • **Critical:** 0 licenses are available • **Warning:** Fewer than 2 licenses are available, or if you have more than 20 pre-paid licenses, fewer than 5 are available.
Service	
Service	VDX Analytics creates a service component for each Microsoft 365 service in your subscription, as well a component for the suite of services. The components for the individual services provide the status of the service, as well as advisories and the availability history. The component that corresponds to the Microsoft 365 suite provides the status of the service, as well as incidents and advisories. The health states of services and features are displayed based on the status on the Service Health Dashboard in the Microsoft 365 Admin Center.: • **Critical:** Microsoft has reported a service degradation or a service interruption. • **Warning:** Microsoft has reported the service to be in one of the following states: Extended Recovery, False Positive, Investigating, or Restoring Service.

Vantage DX Diagnostics Components

The following table lists the component types that VDX Analytics creates for data it retrieves from VDX Diagnostics. The table also describes how the health state of each component is calculated.

Table 11: Network Path Data from VDX Diagnostics

Component	Description
Object	
Probe	This component represents the probe that is installed at the site. The health state of the probe is calculated as follows: • **Healthy:** If the probe is activated and has checked in, it is healthy. • **Not monitored:** If it has never been activated, it is listed as not monitored. Probes that are not monitored are excluded from the health state calculations. • **Critical:** If it is activated but has not checked in, the health state is listed as critical.
Group	
Site	This component represents the site where the probe is installed. The site health is based on the status of the endpoints that the probe is monitoring. • **Healthy:** If fewer than 5% of the endpoints are in a critical state, the site is healthy. • **Warning:** If more than 5% of the endpoints are in a critical state, the health state is warning. • **Critical:** If all of the endpoints at a site are in a critical state, the health state for the site is critical.
Service	
Endpoints (individual)	These components represent the endpoints that are monitored at a site. For example, if you configured monitoring for two endpoints at a site—such as Teams and Salesforce—VDX Analytics displays one component for each endpoint that is being monitored. You can use this data to understand the experience of users who are accessing the endpoint from a specific site. The health state of this component is based on the network tests that VDX Diagnostics performs between your site and the endpoint you are monitoring. • **Healthy:** If the test did not fail, the component status is shown as healthy. • **Critical:** If the most recent test failed, the health state of the component is critical.

Component	Description
Endpoints (aggregated)	These components represent endpoints that are monitored across a site group. A site group represents a company. For example, if a company has sites in Paris and Toronto, and a probe at each site is monitoring the path to Microsoft Teams, VDX Analytics displays a component that shows the overall health of the connection to the Teams endpoint, based on the experience of both the Paris and Toronto sites. You can use this data to understand your company's overall experience with a specific endpoint, because the health state is based on an aggregation of information from all sites: • **Healthy:** If fewer than 5% of the aggregated endpoints are in a critical state, the component is healthy. • **Warning:** If more than 5% of the endpoints that are monitored for the site group are in a critical state, the health state of the component is warning. • **Critical:** If more than 50% of the endpoints that are monitored for the site group are in a critical state, the health state of the component is critical.

> **Tip:**
> If you click the **Go to Source** button for the components that represent sites and endpoints, VDX Analytics opens the network path diagram within the VDX Analytics interface.

Vantage DX Monitoring Components

The following table lists the data that VDX Analytics retrieves from Vantage DX Monitoring. The table also describes how the health state of each component is calculated.

Table 12: Synthetic Transactions from Vantage DX Monitoring

Component	Description
Object	

Component	Description
Workloads	This component represents the applications or workloads that the robots test—such as Microsoft Exchange, SharePoint, or Teams. The robot performs tests and compares the results to performance thresholds. The health state of the workload is based on this comparison. When test results fall below the performance thresholds, the health state of the workload component is either Warning or Critical, and VDX Analytics displays an alert. Health states and alerts are based on the same performance thresholds. The tests and thresholds are different for each workload. For a list of the tests and thresholds used to calculate the health state of the workload components, see "Vantage DX Monitoring Alerts" on page 95.

Component	Description
Robot Manager instances	This component represents the Robot Manager service, which is a Windows service installed at your business sites. VDX Analytics displays one object for every Robot Manager that you configure. This component raises alerts under the following circumstances: • If the Robot Manager has not sent a heartbeat, which may indicate that the machine where it is installed is offline. • If any of the workload configurations assigned to this Robot Manager are not working. You can use this object component in conjunction with the service component, described below. By having two components to represent the Robot Manager instances, you can send notifications to different teams in your organization when there is an alert. For example, you may want to send notifications to a team that is responsible for hardware or infrastructure when the Robot Manager is offline, and send notifications to an applications team if any of the workload configurations assigned to Robot Manager are not working. The health states of the Robot Manager instance is calculated as follows: • **Critical:** To calculate the health state of the Robot Manager service, VDX Analytics monitors its heartbeat. If the Robot Manager service is unavailable, the health state is Critical. • **Warning:** If a heartbeat has not been received in the last 20 minutes, the health state is Warning. • **Critical:** If any of the workloads assigned to this Robot Manager are not working.
Group	
Tags	Tags that are associated with the Robot Manager service display as Groups. These tags indicate the geographical location of the Robot Manager service, and can also be used to categorize the Robot Manager service in other ways. VDX Analytics creates one group for every tag that you configure. Tags do not have health states of their own. Instead, tags reflect the health state of the components that they are associated with. The health state of each tag is based on the worst-case health state of the Robot Manager service and the workloads that they are associated with.
Service	

Component	Description
Robot Manager instances	This component represents the Robot Manager service, which is a Windows service installed at your business sites. VDX Analytics displays one service for every Robot Manager that you configure. The health states of the Robot Manager service is calculated as follows: - **Critical:** To calculate the health state of the Robot Manager service, VDX Analytics monitors its heartbeat. If the Robot Manager service is unavailable, the health state is Critical. - **Warning:** If a heartbeat has not been received in the last 20 minutes, the health state is Warning. - **Critical:** If the Robot Manager has been unable to perform any synthetic transactions, or if any of the workloads assigned to this Robot Manager are not working.

Alerts and Thresholds

VDX Analytics displays alerts based on the information it retrieves from the systems it is integrated with.

There are three types of alerts, which are color-coded to indicate severity:

- **Blue:** Information
- **Yellow:** Warning
- **Red:** Error

By default, only alerts with a severity of Error and Warning are displayed on the Alerts tab. Information alerts are not shown unless you choose to show them using the filters on the page.

The following sections describe the alerts and the thresholds that determine their severity:

Microsoft CQD

VDX Analytics displays alerts for calls where the user experienced poor voice quality. The alerts are based on the settings that you configure for the integration, as well as thresholds that are pre-defined in the Microsoft Call Quality Dashboard (CQD).

VDX Analytics displays alerts for calls made during the data collection period, which you specify when you configure the integration. Alerts are automatically cleared when they are outside of the data collection period.

You can quickly see all alerts related to the Microsoft CQD by using the pre-defined search. You can access the search by clicking the main menu and then selecting **Explore > Teams Alerts**.

The following table lists the metrics and thresholds that trigger alerts.

Table 13: Metrics and Thresholds for Alerts

Metric	Description
Packet Loss (Reverse Packet Loss and Forward Packet Loss)	The number of packets lost in a 15-second interval. For example, if 1000 packets are sent in a 15-second interval and 50 are lost, the packet loss rate is 5%. If the packet loss rate is greater than 10%, the call is marked as poor by Microsoft.

Metric	Description
Video Frame Rate Avg	The average number of frames per second received for a video stream, calculated over the duration of the session. Video sessions in Teams include screen sharing and application sharing. An alert is raised if the average is less than 7 FPS (frames per second). A frame rate of 0 indicates that the video failed to stream.
Round Trip (Forward and Reverse)	The average round-trip network propagation time, in milliseconds. If this is greater then 500 ms, call quality is marked as poor.
Jitter (Forward and Reverse)	Jitter indicates the size of the buffer that is needed to store packets before they are reconstructed in the correct order. If jitter is above 30 ms, the call quality is marked as poor.
Video Local Frame Loss Percentage Avg	The average percentage of video frames lost as they are displayed to the user, including frames recovered from network losses. If this value is greater then 50% on any video stream, the call quality is marked as poor.
Degradation	The average Network Mean Opinion Score (NMOS) for an audio stream. It is a measure of how network loss and jitter have degraded audio quality. If the value is greater than 1.0, the call quality is marked poor.
Concealed Ratio	The average ratio of concealed samples generated by audio healing compared to typical samples. The audio output at an endpoint is classified as either "normal" or "concealed." 'Concealed samples help improve sound quality by smoothing transitions when packets are lost. High values indicate packet loss or jitter, and result in distorted or lost audio. When the Concealed Ratio is greater than .07, the call is marked as poor.
Client Bandwidth Estimate and End Point Bandwidth Estimate	The average estimated bandwidth available between the first and second endpoint in bits per second (bps). The estimate is based on packet latency.

Microsoft 365

VDX Analytics displays alerts based on the status of services as reported on the Service Health Dashboard in the Microsoft 365 Admin Center.

The following table lists the status shown in the Microsoft 365 Admin Center and the severity of the corresponding alert in VDX Analytics. The table also provides a brief description of each status; for detailed descriptions, see the Microsoft documentation at the following URL:

 https://learn.microsoft.com/en-us/microsoft-365/enterprise/view-service-health?view=o365-worldwide#status-definitions

Table 14: Alerts for Microsoft 365 Services

Status in M365 Admin Center	Alert Severity in VDX Analytics	Description
Service Degradation	Error	An issue may affect the performance of a service or feature.
Service Interruption	Error	An issue affects the availability of a service.
Extended Recovery	Warning	Corrective action is in progress.
Restoring Service	Warning	The cause of the issue has been identified and corrective action is in progress.
Service Operational	Information	The service is healthy.
Service Restored	Information	Corrective action has resolved the issue.
False Positive	Information	After investigation, the service is determined to be healthy and operating as designed.
Investigating	Information	Microsoft is investigating a potential issue and is determining the scope of the impact.

Vantage DX Diagnostics

The following table describes the conditions that cause alerts. Alerts are automatically cleared when the conditions that caused them are resolved.

Table 15: Alerts for VDX Diagnostics Components

Component Type	Alert Severity
Object	
Probe	This component represents the probe that is installed at the site. The following alerts are raised for VDX Diagnostics probes: • **Critical:** If a probe is activated but has not checked in, VDX Analytics displays an alert with a severity level of Warning.
Service	
Endpoints (individual)	These components represent the endpoints that are monitored at a site. For example, if you configured monitoring for two endpoints at a site—such as Teams and Salesforce—VDX Analytics displays one component for each endpoint that is being monitored. The following alerts are raised for the endpoints that VDX Diagnostics is testing: • **Error:** If the most recent test failed, VDX Analytics displays an alert with a severity level of Error.

> **Tip:**
> You can click the **Go to Source** button to see more information. For alerts with a severity of Warning, the **Go to Source** button opens theVDX Diagnostics interface. For alerts with a severity of Critical, the **Go to Source** button displays network path information related to the alert.

Vantage DX Monitoring Alerts

VDX Analytics displays the following types of alerts related to Vantage DX Monitoring:

- Alerts about the health state of the Robot Manager, which is a service you install on a dedicated machine in your environment.
- Alerts about the performance of the workloads that you are monitoring.

Robot Manager Health

A critical alert is raised if the Robot Manager has not sent a heartbeat within the past 15 minutes.

Critical alerts are also raised if any of the robots configured on a Robot Manager machine have failed to perform workload tests at the expected frequency.

Performance Alerts for Workloads

VDX Analytics displays alerts for the workloads that you have configured Vantage DX Monitoring to test. The robot performs tests and compares the results to performance thresholds. The health state of the workload is based on this comparison. The performance thresholds are based on industry standards, but some workloads have configurable thresholds, so that you can change them based on your needs.

The following table lists each workload that Vantage DX Monitoring can test, and indicates which ones have configurable thresholds. Click the links in the table to see information about the thresholds and their default values, as well as the health state and the severity of the alert that is shown if the threshold is breached.

Table 16: Workloads and Thresholds

Workload	Thresholds	Configurable?
AAD Connect	"AAD Connect Thresholds" on page 97	—
ADFS	"ADFS Thresholds" on page 98	✓
Exchange DAG	"Exchange DAG Thresholds" on page 98	—
Exchange Edge Server	"Exchange Edge Thresholds" on page 99	✓
Exchange Free/Busy	"Exchange Advanced Free/Busy Thresholds" on page 98	✓
Exchange Mailbox Server	"Exchange Mailbox Server Thresholds" on page 100	✓
Exchange MAPI	"Exchange MAPI Thresholds" on page 104	✓
Exchange Online	"Microsoft Exchange Thresholds" on page 105	✓
Exchange OWA	"Exchange OWA Thresholds" on page 106	✓
Hybrid Mail Routing	"Hybrid Mail Routing Thresholds" on page 107	✓

Workload	Thresholds	Configurable?
Internal Mail Routing	"Internal Mail Routing Thresholds" on page 108	✓
Office 365 Health	"Microsoft 365 Health Thresholds" on page 108	—
Office 365 Web App	"Office 365 Web App Thresholds" on page 109	✓
OneDrive	"OneDrive Thresholds" on page 109	✓
Roundtrip Mail Routing	"Roundtrip Mail Routing Thresholds" on page 110	✓
SharePoint Page	"SharePoint Page Thresholds" on page 111	✓
SMTP Gateways	"SMTP Gateways Thresholds" on page 111	✓
Teams	"Teams Thresholds" on page 112	✓
Teams Advanced	"Teams Advanced Thresholds" on page 112	✓
Teams Video	"Teams Video Thresholds" on page 113	✓
URL	"URL Thresholds" on page 114	✓

AAD Connect Thresholds

For the Azure Active Directory (AAD) Connect workload, the robots compare the date that user information in your on-premises Active Directory was synchronized with the Azure AD tenant of your Microsoft 365 subscription.

The following table lists the performance thresholds for the AAD Connect workload.

Table 17: Default Thresholds for AAD Connect

Description	Type of Notification	Threshold
Synchronization date and time	Warning	If last date and time is older than 24 hours

Description	Type of Notification	Threshold
Cannot connect or synchronization error is reported	Critical	—

ADFS Thresholds

For the Active Directory Federation Services (ADFS) workload, the robots log into an ADFS endpoint and receive authentication tokens.

The following table lists the thresholds that you can configure for the ADFS workload.

Table 18: Default Thresholds for ADFS

Threshold Name and Description	Type of Alert	Default Value
ADFS Performance Threshold An alert is raised when the robot does not receive an authentication token within the time specified.	Warning	3000 ms
ADFS Critical Threshold An alert is raised when authentication fails.	Critical	5000 ms

Exchange DAG Thresholds

The following table lists the performance thresholds for the Exchange DAG workload.

Table 19: Default Thresholds for Exchange DAG

Description	Type of Notification
The health check returns an error.	Warning
The health check fails.	Critical

Exchange Advanced Free/Busy Thresholds

The following table lists the thresholds that you can configure for the Exchange Advanced Free/Busy workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 20: Default Thresholds for Exchange Advanced Free/ Busy

Threshold Name and Description	Type of Alert	Default Value
Free/Busy Performance Status Threshold for Open Mailbox action An alert is raised based on the time required to open a mailbox.	Warning	6000 ms
Free/Busy Performance Status Threshold An alert is raised based on the time required to query the availability of the user.	Warning	4000 ms
Free/Busy Critical Status Threshold	Critical	6000 ms
Free/Busy Critical Status Threshold for Open Mailbox action An alert is raised based on the time required to open a mailbox.	Critical	9000 ms

Exchange Edge Thresholds

The following table lists the thresholds that you can configure for the Exchange Edge server, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 21: Default Thresholds for Exchange Edge

Threshold Name and Description	Type of Alert	Default Value
Exchange Edge Unreachable Queue Length Threshold An alert is raised based on the number of messages that cannot be routed to their destinations.	Warning	100 messages
Exchange Edge RAM Threshold An alert is raised based on the amount of memory in use compared to the amount of committed memory.	Warning	90%
Exchange Edge Messaged Queued for Delivery Threshold Vantage DX Monitoring raises a notification based on the number of messages that are in the processing queue for delivery.	Warning	300 messages

Threshold Name and Description	Type of Alert	Default Value
Exchange Edge Processor Time Threshold An alert is raised when the server is executing processes for more then 75% of the time.	Warning	75 %
Exchange Edge Poison Queue Length Threshold An alert is raised based on the number of messages in the poison queue. The poison queue isolates messages that contain errors and are determined to be harmful to Exchange after a server or service failure.	Warning	5 messages
Exchange Edge Disk Threshold An alert is raised when less than 10% of the disk is free space.	Warning	10 %

Exchange Mailbox Server Thresholds

You can configure the following thresholds for the Exchange Mailbox server:

- "Client Access Thresholds" on page 100
- "Database Thresholds" on page 101
- "Lagged Copies Thresholds" on page 101
- "System Thresholds" on page 102
- "Transport Thresholds" on page 104

Client Access Thresholds

The following table lists the thresholds that you can configure for the Exchange Mailbox Server Client Access workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 22: Default Thresholds for Exchange Mailbox Server Client Access

Threshold Name and Description	Type of Alert	Default Value
RPC Client Access Requests Threshold Alerts are based on the number of requests processed by the RPC Client Access service.	Warning	40 requests
RPC Client Access Averaged Latency Time Threshold Alerts are based on the average latency for the RPC Client Access service.	Warning	250 ms

Database Thresholds

The following table lists the thresholds that you can configure for the Exchange Mailbox Server Database workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 23: Default Thresholds for Exchange Mailbox Server Databases

Threshold Name and Description	Type of Alert	Default Value
Store RPC Requests Threshold Alerts are based on the number of RPC requests currently executing within the information store.	Warning	70 requests
Database Reads (Attached) Average Latency Time Threshold Alerts are based on the average time of latency to read from the database.	Warning	20 ms
Database Writes (Attached) Average Latency Time Threshold Alerts are based on the average time of latency to write to the database file.	Warning	50 ms
Database Log Writes Average Latency Time Threshold Alerts are based on the average time of latency for each log write operation.	Warning	10 ms
Database Reads Recovery Average Latency Time Threshold Alerts are based on the average time of latency for each passive database read operation.	Warning	200 ms
Store RPC Average Latency Time Threshold Alerts are based on the average time of latency for RPC requests for each database.	Warning	50 ms
Client Type RPC Average Latency Time Threshold Alerts are based on the average time of latency for the RPC server.	Warning	50 ms

Lagged Copies Thresholds

The following table lists the thresholds that you can configure for the Exchange Mailbox Server Lagged Copies workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 24: Default Thresholds for Exchange Mailbox Server Lagged Copies

Threshold Name and Description	Type of Alert	Default Value
Replay Lag Status Percentage Threshold Alerts are based on the log file replay percentage from an active database into its passive lagged database copy.	Warning	100 %

System Thresholds

The following table lists the thresholds that you can configure for the Exchange Mailbox Server System, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 25: Default Thresholds for Exchange Mailbox Server - System

Threshold Name and Description	Type of Alert	Default Value
ASPNet Request Wait Time Threshold Alerts are based on the amount of time that the request waited in the queue for processing.	Warning	0 ms
Exchange Mailbox Disk Threshold An alert is raised when less than 10% of the disk is free space.	Warning	10 %
Domain Controllers LDAP Read Time Threshold Alerts are based on the amount of time it takes to send a message to the domain controller and receive a response.	Warning	100 ms
Processor Percentage Time Threshold Alerts are based on the percentage of time that the processor is executing instructions.	Warning	75 %
Processes LDAP Search Time Threshold Alerts are based on the amount of time it takes to send an LDAP search request and receive a response.	Warning	100 ms
Domain Controllers LDAP Search Time Threshold Alerts are based on the time (in ms) to send an LDAP search request to a domain controller and receive a response.	Warning	100 ms

Threshold Name and Description	Type of Alert	Default Value
Processor Privileged Percentage Time Threshold Alerts are based on the amount of elapsed time that the service was running in privileged mode.	Warning	75 %
.Net CLR Memory GC Percentage Time Threshold Alerts are based on the amount of time required to perform garbage collection. This process requires CPU and memory and can cause delays and disconnections if it exceeds the threshold.	Warning	10 %
Processes LDAP Read Time Threshold Alerts are based on the amount of time required to send an LDAP request to a domain controller and receive a response.	Warning	100 ms
ASPNet Application Restarts Threshold Notifications are based on the number of restarts of the ASP.NET application.	Warning	0 restarts
Processor Queue Length Threshold Alerts are based on the number of threads the processor is servicing. A value higher than the threshold can cause high CPU usage and can indicate that processor capacity is not sufficient.	Warning	6 threads
Memory Committed Bytes In Use Percentage Threshold Alerts are based on the amount of committed virtual memory in use, as a percentage of the memory/commit limit.	Warning	80 %
Network Packets Outbound Errors Threshold Alerts are based on the number of outbound packets in error.	Warning	0 packets
ASPNet Requests In Application Queue Threshold Alerts are based on the number of requests waiting for service in the application queue.	Warning	0 requests
Processor User Percentage Time Threshold Alerts are based on the percentage of processor time spent in user mode, which is a processing mode for applications and subsystems.	Warning	75 %

Threshold Name and Description	Type of Alert	Default Value
ASPNet Worker Process Restarts Threshold Alerts are based on the number of restarts of the ASP.NET worker process.	Warning	0 restarts

Transport Thresholds

The following table lists the thresholds that you can configure for the Exchange Mailbox Server Transport workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 26: Default Thresholds for Exchange Mailbox Server—Transport

Threshold Name and Description	Type of Alert	Default Value
Number Of Messages In Queue Threshold Alerts are based on the number of messages waiting for service in the queue.	Warning	300 messages

Exchange MAPI Thresholds

The following table lists the thresholds that you can configure for Exchange MAPI, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 27: Default Thresholds for Exchange MAPI

Threshold Name and Description	Type of Alert	Default Value
MAPI Critical Status Threshold Alerts are based on the amount of time required to create an email message and create a meeting.	Critical	8 s
MAPI Performance Status Threshold Alerts are based on the amount of time required to create an email message and create a meeting.	Warning	5 s
MAPI Critical Status Threshold for Open Mailbox action Alerts are based on the amount of time required to open a mailbox.	Critical	11 s
MAPI Performance Status Threshold for Open Mailbox action Alerts are based on the amount of time required to open a mailbox.	Warning	8 s

Microsoft Exchange Thresholds

The following table lists the thresholds that you can configure for Exchange, the default values, and the type of type of alert that is raised when the threshold is exceeded. Alerts are based on the amount of time required to perform each task.

These thresholds apply to the Exchange Online workload.

Table 28: Default Thresholds for Exchange

Threshold Name and Description	Type of Alert	Default Value
Exchange Critical Status Threshold for Create Folder action	Critical	6000 ms
Exchange Performance Status Threshold for Create Folder action	Warning	4000 ms
Exchange Critical Status Threshold for Delete Folder action	Critical	6000 ms
Exchange Performance Status Threshold for Delete Folder action	Warning	4000 ms
Exchange Critical Status Threshold for Create Message action	Critical	6000 ms
Exchange Performance Status Threshold for Create Message action	Warning	4000 ms
Exchange Critical Status Threshold for Upload Attachment action	Critical	6000 ms
Exchange Performance Status Threshold for Upload Attachment action	Warning	4000 ms
Exchange Critical Status Threshold for Download Attachment action	Critical	6000 ms
Exchange Performance Status Threshold for Download Attachment action	Warning	4000 ms
Exchange Critical Status Threshold for Remove Attachment action	Critical	6000 ms
Exchange Performance Status Threshold for Remove Attachment action	Warning	4000 ms
Exchange Critical Status Threshold for Create Task action	Critical	6000 ms
Exchange Performance Status Threshold for Create Task action	Warning	4000 ms

Threshold Name and Description	Type of Alert	Default Value
Exchange Critical Status Threshold for Delete Task action	Critical	6000 ms
Exchange Performance Status Threshold for Delete Task action	Warning	4000 ms
Exchange Critical Status Threshold for Search Using Filter action	Critical	6000 ms
Exchange Performance Status Threshold for Search Using Filter action	Warning	4000 ms
Exchange Critical Status Threshold for Create Meeting action	Critical	6000 ms
Exchange Performance Status Threshold for Create Meeting action	Warning	4000 ms
Exchange Critical Status Threshold for Query Free/Busy action	Critical	6000 ms
Exchange Performance Status Threshold for Query Free/Busy action	Warning	4000 ms
Exchange Critical Status Threshold for Delete Event action	Critical	6000 ms
Exchange Performance Status Threshold for Delete Event action	Warning	4000 ms
Exchange Critical Status Threshold for Open Mailbox action	Critical	9000 ms
Exchange Performance Status Threshold for Open Mailbox action	Warning	6000 ms

Exchange OWA Thresholds

The following table lists the thresholds that you can configure for Exchange MAPI, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 29: Default Thresholds for Exchange MAPI

Threshold Name and Description	Type of Alert	Default Value
OWA Performance Status Threshold for Open Mailbox action. Alerts are based on the amount of time required to open a mailbox.	Warning	8000 ms
OWA Critical Status Threshold for Open Mailbox action. Alerts are based on the amount of time required to open a mailbox.	Critical	11000 ms
OWA Critical Status Threshold for Create Email action Alerts are based on the amount of time required to create an email.	Warning	5000 ms
OWA Critical Status Threshold for Create Email action Alerts are based on the amount of time required to create an email.	Critical	8000 ms
OWA Critical Status Threshold for Create Meeting action. Alerts are based on the amount of time required to create a meeting.	Warning	5000 ms
OWA Critical Status Threshold for Create Meeting action. Alerts are based on the amount of time required to create a meeting.	Critical	8000 ms

Hybrid Mail Routing Thresholds

The following table lists the thresholds that you can configure for Hybrid Mail Routing, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 30: Default Thresholds for Hybrid Mail Routing

Threshold Name and Description	Type of Alert	Default Value
Hybrid Mail Routing Performance Status Threshold Alerts are based on the amount of time required to connect to Exchange, as well as mail routing times and roundtrip times (RTT).	Warning	30000 ms

Threshold Name and Description	Type of Alert	Default Value
Hybrid Mail Routing Critical Threshold Alerts are based on the amount of time required to connect to Exchange, as well as mail routing times and roundtrip times (RTT).	Critical	120000 ms

Internal Mail Routing Thresholds

The following table lists the thresholds that you can configure for Internal Mail Routing, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 31: Default Thresholds for Internal Mail Routing

Threshold Name and Description	Type of Alert	Default Value
Internal Mail Routing Performance Status Threshold Alerts are based on the amount of time required to connect to Exchange and route mail to internal addresses.	Warning	15000 ms
Internal Mail Routing Critical Status Threshold Alerts are based on the amount of time required to connect to Exchange and route mail to internal addresses.	Critical	60000 ms

Microsoft 365 Health Thresholds

When you configure the Office 365 Health workload in Vantage DX Monitoring, the robots test a fixed list of services. The robots monitor whether there are incidents reported by Microsoft, or whether any advisories have been issued.

The services monitored by the robots are:

- Azure Information Protection
- Dynamics 365
- Exchange Online
- Identity Service
- Microsoft Forms
- Flow in Microsoft 365
- Microsoft StaffHub
- Microsoft Teams
- Microsoft Intune
- Office Client Applications
- Office for the Web

- Planner
- PowerApps in Microsoft 365
- Mobile Device Management for Microsoft 365
- Yammer Enterprise
- Office 365 Portal
- OneDrive for Business
- Power BI
- SharePoint Online

If there is a service in the list that you have not deployed in your organization, the health state is shown as red if you do not disable statuses for that service.

The following table lists the performance thresholds for Microsoft 365 services.

Table 32: Default Thresholds for Microsoft 365 Services

Description	Type of Notification
Microsoft has issued an advisory to indicate that a problem may affect some users. The service is available and the scope of the impact is limited.	Warning
Microsoft is reporting an incident that is causing major service degradation or a service interruption.	Critical

Office 365 Web App Thresholds

The following table lists the thresholds that you can configure for the Office 365 Web App, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 33: Default Thresholds for Office 365 Web App

Threshold Name and Description	Type of Alert	Default Value
Office 365 Web App Performance Status Threshold Alerts are based on the amount of time required for the page to load after logging in.	Warning	5000 ms

OneDrive Thresholds

The following table lists the thresholds that you can configure for the OneDrive workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 34: Default Thresholds for OneDrive

Threshold Name and Description	Type of Alert	Default Value
OneDrive Performance Status Threshold for Login action Alerts are based on the time required to log into OneDrive.	Warning	6000 ms
OneDrive Critical Status Threshold for Login action Alerts are based on the time required to log into OneDrive.	Critical	9000 ms
OneDrive Performance Status Threshold for Download action Alerts are based on the time required to download a file from OneDrive.	Warning	3000 ms
OneDrive Critical Status Threshold for Download action Alerts are based on the time required to download a file from OneDrive.	Critical	5000 ms
OneDrive Performance Status Threshold for Upload action Alerts are based on the time required to upload a file to OneDrive.	Warning	6000 ms
OneDrive Performance Status Threshold for Upload action Alerts are based on the time required to upload a file to OneDrive.	Critical	9000 ms
OneDrive Performance Status Threshold for Create Folder action Alerts are based on the time required to create a OneDrive folder.	Warning	6000 ms
OneDrive Critical Status Threshold for Create Folder action Alerts are based on the time required to create a OneDrive folder.	Critical	9000 ms

Roundtrip Mail Routing Thresholds

The following table lists the thresholds that you can configure for Roundtrip Mail Routing, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 35: Default Thresholds for Roundtrip Mail Routing

Threshold Name and Description	Type of Alert	Default Value
Roundtrip Mail Routing Critical Status Threshold Alerts are based on the amount of time required to route mail to external addresses.	Critical	300000 ms
Roundtrip Mail Routing Performance Status Threshold Alerts are based on the amount of time required to route mail to external addresses.	Warning	60000 ms

SharePoint Page Thresholds

The following table lists the thresholds that you can configure for SharePoint pages, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 36: Default Thresholds for SharePoint Pages

Threshold Name and Description	Type of Alert	Default Value
SharePoint Page Performance Status Threshold Alerts are based on the amount of time required for the page to load after logging in.	Warning	5000 ms

SMTP Gateways Thresholds

The following table lists the thresholds that you can configure for SMTP Gateways, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 37: Default Thresholds for SMTP Gateways

Threshold Name and Description	Type of Alert	Default Value
SMTP Gateways Performance Status Threshold Alerts are based on the amount of time required to connect to Exchange and route SMTP mail.	Warning	60000 ms
SMTP Gateways Critical Status Threshold Alerts are based on the amount of time required to connect to Exchange and route SMTP mail.	Critical	300000 ms

Teams Thresholds

The following table lists the thresholds that you can configure for the Teams workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 38: Default Thresholds for Teams

Threshold Name and Description	Type of Alert	Default Value
Teams Performance Status Threshold An alert is raised if the average Mean Opinion Score (MOS) is below this threshold. MOS is a predictor of voice quality.	Warning	3.8 MOS
Teams Critical Status Threshold An alert is raised if the average Mean Opinion Score (MOS) is below this threshold. MOS is a predictor of voice quality.	Critical	3.5 MOS

Teams Advanced Thresholds

The following table lists the thresholds that you can configure for the Teams Advanced workload, the default values, and the type of alert that is raised when the threshold is exceeded. Alerts are based on the amount of time required to perform each of the tasks.

Table 39: Default Thresholds for Teams Advanced

Threshold Name and Description	Type of Alert	Default Value
Teams Performance Status Threshold An alert is raised if the average Mean Opinion Score (MOS) is below this threshold. MOS is a predictor of voice quality.	Warning	3.8 MOS
Teams Critical Status Threshold An alert is raised if the average Mean Opinion Score (MOS) is below this threshold. MOS is a predictor of voice quality.	Critical	3.5 MOS
Teams Performance Status Threshold for Connection Time Action	Warning	6000 ms
Teams Critical Status Threshold for Connection Time Action	Critical	9000 ms
Teams Performance Status Threshold for Create a Channel Time Action	Warning	6000 ms

Threshold Name and Description	Type of Alert	Default Value
Teams Critical Status Threshold for Create a Channel Time Action	Critical	9000 ms
Teams Performance Status Threshold for Post Message to Channel Time Action	Warning	6000 ms
Teams Critical Status Threshold for Post Message to Channel Time Action	Critical	9000 ms
Teams Performance Status Threshold for Upload File to Channel Time Action	Warning	6000 ms
Teams Critical Status Threshold for Upload File to Channel Time Action	Critical	9000 ms
Teams Performance Status Threshold for Download File Time Action	Warning	6000 ms
Teams Critical Status Threshold for Download File Time Action	Critical	9000 ms
Teams Performance Status Threshold for Search User Time Action	Warning	6000 ms
Teams Critical Status Threshold for Search User Time Action	Critical	9000 ms
Teams Performance Status Threshold for Check Presence Time Action	Warning	6000 ms
Teams Critical Status Threshold for Check Presence Time Action	Critical	9000 ms
Teams Performance Status Threshold for Instant Message Time Action	Warning	6000 ms
Teams Critical Status Threshold for Instant Message Time Action	Critical	9000 ms

Teams Video Thresholds

The following table lists the thresholds that you can configure for Teams Videos, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 40: Default Thresholds for Teams Videos

Threshold Name and Description	Type of Alert	Default Value
Teams Video Performance Status Threshold Alerts are based on the frames per second (FPS) for outbound video streams.	Warning	7.5 FPS
Teams Video Critical Status Threshold Alerts are based on the frames per second (FPS) for outbound video streams.	Critical	7 FPS

> **Note:** If you expect your users to regularly utilize screen sharing on Teams Video, we recommend that you change the default Teams Video Critical Status Threshold from 7 FPS to 1 FPS.

URL Thresholds

The following table lists the thresholds that you can configure for the URL workload, the default values, and the type of alert that is raised when the threshold is exceeded.

Table 41: Default Thresholds for URL

Threshold Name and Description	Type of Alert	Default Value
URL Performance Status Threshold An alert is raised if the HTTP response time is slower than time specified for the threshold.	Warning	3000 ms
URL HTTP Min Status Code Success Threshold The minimum status code for the range of status codes to be excluded from Critical alerts.	Critical	200 status code
URL HTTP Max Status Code Success Threshold The maximum status code for the range of status codes to be excluded from Critical alerts.	Critical	200 status code

Searching for Data

The following sections provide information about the different types of searches that are available in VDX Analytics.

- "Pre-Defined Teams Searches" on page 115
- "Default Boards" on page 116
- "Custom Searches" on page 117

Pre-Defined Teams Searches

Under the Explore menu, sub-menus display that provide access to pre-defined searches. These searches allow you to quickly find data that Vantage DX Analytics has retrieved from the Microsoft Teams CQD integration. The following searches are available:

- Users with poor calls within 24 hours
- Users with poorly rated calls within 7 days
- Users with Wi-Fi signal strength issues within 7 days
- User Devices
- Teams Alerts
- Teams Meetings
- Meeting Rooms
- Offices
- Locations with poor calls within 1 month
- Offline IP phones

You can pin the search results to boards or business services. You cannot delete pre-defined searches.

> **Note:**
> We recommend that you configure a consolidation rule before you use the Meeting Rooms search. For more information, see

"Configure Meeting Room Data" on page 18

Default Boards

After you configure an integration between VDX Analytics and the Microsoft CQD, VDX Analytics automatically creates a set of boards based on searches for CQD data. The main board is named "Microsoft Teams <integration name>," where <integration name> is that name that you specify when you configure the integration between Vantage DX and your Microsoft CQD. The main board contains a sub-board for each of the following searches:

- Users with poor calls within 24hrs
- Users with poorly rated calls within 7 days
- Users with Wi-Fi signal strength issues within 7 days
- Locations with poor calls within 1 month

Because these boards are based on searches, the health state of these boards is determined by the search results. If there are no results that match the search criteria—for example, if there are no users who experienced poor calls within the past 24 hours—the health state of the board is green. If there are results that match the search criteria, the health state of the board is red. You can configure notifications for these boards.

You can view the default boards by clicking the main menu and selecting **Data Analysis > Boards**.

Note:
If your instance of Vantage DX was deployed prior to Release 3.17 (June 2024), it will not include these default boards. However, the searches are available under the **Explore** menu, and you can use them to create boards. For information about best practices and how to configure dashboard notifications based on these searches, see the "Manage Notifications and Incidents" section of the *Vantage DX Deployment Guide*. The guide is available from the Martello Help Center at the following link:

https://helpcenter.martellotech.com/s/documentation/vantage-dxcloud

Instances of Vantage DX that were deployed prior to Release 3.17 (June 2024) provide the default boards listed in the following table .

Table 42: Default Boards for Microsoft CDQ Integrations (Deployments prior to Release 3.17)

Board Name	Description
By Symptom <integration name>	The By Symptom board contains the following sub-boards: • **Users with high jitter <integration name>**—Displays users whose forward jitter or reverse jitter exceeds 30 ms. Forward jitter is the jitter from the client to the destination; reverse jitter is the jitter from the destination to the client. • **Users with high RTT <integration name>**—Displays users whose forward or reverse round-trip time exceeds 100 ms. Forward RTT is the round-trip time from the client to the destination; reverse RTT is is the round-trip time from the destination to the client. • **Users with low bandwidth <integration name>**—Displays users whose average available bandwidth is estimated as low. The estimate is calculated based on packet latency. • **Users with failed calls <integration name>**—Displays users who experienced more than four failed calls over the time period specified in the lookback period configured in the integration settings. • **Wifi Users with poor calls <integration name>**—Displays users who are connected through WIFI and who experienced calls with poor call quality over the time period specified in the lookback period configured in the integration settings.
Teams ISPs <integration name>	This board displays all of the ISPs that provide connectivity for users in the organization.
Teams Locations <integration name>	This board displays all of the countries where your users are connected.

Custom Searches

The following sections provide some suggested searches that you can use to find targeted information in VDX Analytics.

There are three self-guided training modules available to help you learn about searches in VDX Analytics:

- Search Fundamentals
- Custom Searches
- Creating and Using Saved Searches

You can find these modules in the Managing Data section of our Vantage DX Online Training site.

Users

This section lists searches that help you find information about users.

View the Experience of a Specific User

source.Office365CQD.Name:"<User Name>"

View the Experience of a Multiple Users

In the following search, enter the UPNs of specific users, such as VIPs. For example, john.doe@company.com.

source.Office365CQD.Email:("<UPN1>" OR "<UPN2>" OR "<UPN3>") AND source.Office365CQD.CQDComponentType:User

Identify Users with Low MOS

source.Office365CQD.AverageMOS:(>0 AND <4)

View Meetings with Poor Call Quality Attended by Specific Users

In the following search, enter the UPNs of specific users, such as VIPs. For example, john.doe@company.com.

source.Office365CQD.Poor\ Call\ Attendees.UserDeviceId:("<UPN1>" OR "<UPN2>" OR "<UPN3>")

You can also find this information using the display name instead of the UPN:

source.Office365CQD.Id:("<Display Name 1>" OR "<Display Name 2<" OR "<Display Name 3>") AND source.Office365CQD.groupType:Meeting

View User Devices by Operating System

The following example searches for Windows devices. You can edit this query to search for other operating systems, such as MacOS, IOS, or Android.

source.Office365CQD.Email:("<UPN1>" OR "<UPN2>" OR "<UPN3>") AND source.Office365CQD.ClientOS:<Windows>

VIP Meeting Organizers

The following example searches for meetings organized by specified users.

source.Office365CQD.Id:("<Display Name>" OR "<Display Name>" OR "<Display Name>") AND source.Office365CQD.groupType:Meeting

Meetings with Poor Call Quality for Specified Users

The following example searches for meetings with poor call quality that involved a specified user.

source.Office365CQD.Poor\ Call\ Attendees.UserDisplayName:"<Display Name>"

The following example shows how you can modify this search to include multiple users, such as a group of VIPs, by using the AND operator.

source.Office365CQD.Poor\ Call\ Attendees.UserDisplayName:"<Display Name>" AND "<Display Name>"

View Users in a Specific Department

To search on a department, the Department property must be configured in your Azure Active Directory (AAD). The following example searches for a department named Executive Board; edit this property to suit your needs.

source.Office365CQD.Department:"<Executive Board>"

User Devices with Poor Forward Metrics on Wired connections

(source.Office365CQD.ForwardJitter:>30 OR source.Office365CQD.ForwardRTT:>500 OR source.Office365CQD.ForwardPacketLoss:>0.1) AND

source.Office365CQD.ConnectionType:Wired

WiFi Users with High Jitter (Forward and Reverse)

source.Office365CQD.ConnectionType:Wifi AND
(source.Office365CQD.ForwardJitter:>30 OR source.Office365CQD.ReverseJitter:>30)

WiFi Users High RTT (Forward and Reverse)

source.Office365CQD.ConnectionType:Wifi AND
(source.Office365CQD.ForwardRTT:>500 OR source.Office365CQD.ReverseRTT:>500)

WiFi Users High Packet Loss (Forward and Reverse)

source.Office365CQD.ConnectionType:Wifi AND
(source.Office365CQD.ForwardPacketLoss:>0.1 OR
source.Office365CQD.ReversePacketLoss:>0.1)

Wired Users High Jitter (Forward and Reverse)

source.Office365CQD.ConnectionType:Wired AND
(source.Office365CQD.ForwardJitter:>30 OR source.Office365CQD.ReverseJitter:>30)

Wired Users High RTT (Forward and Reverse)

source.Office365CQD.ConnectionType:Wired AND
(source.Office365CQD.ForwardRTT:>500 OR source.Office365CQD.ReverseRTT:>500)

Wired Users High Packet Loss

source.Office365CQD.ConnectionType:Wired AND
(source.Office365CQD.ForwardPacketLoss:>0.1 OR
source.Office365CQD.ReversePacketLoss:>0.1)

Users who Rated a Call with Low Score

source.Office365CQD.CQDComponentType:User AND
source.Office365CQD.PoorCallReasons.Issue:("User Rated Call 1" OR "User Rated Call
2" OR "EndPoint Rated Call 1" OR "EndPoint Rated Call 2")

Users or Endpoints that Rated a Call with Low Score

The following search is helpful if you want to see how a user or an endpoint rated a call. These results display on the Alerts tab.

source.Office365CQD.UserCallRating:(1 OR 2) OR
source.Office365CQD.EndPointCallRating:(1 OR 2)

Connection Type

The following searches allow you to identify how your users are connecting to calls.

source.Office365CQD.ConnectionType:wifi

source.Office365CQD.ConnectionType:wired

source.Office365CQD.ConnectionType:mobileBB

Devices

This section lists searches that help you find information about devices.

Devices Experiencing High Latency and Jitter

source.Office365CQD.ForwardJitter:>30 OR source.Office365CQD.ReverseJitter:>30 OR source.Office365CQD.ForwardRTT:>500 OR
source.Office365CQD.ReverseRTT:>500

Audio Devices with Low Average MOS

This search allows you to see if a device that you supply to your users, such as an IP phone or headset, is impacting call quality. You can also use this information to see the audio devices in use, and then compare that to Microsoft's list of devices that are certified for use with Teams. This example searches on devices with "Built-in input," but you can search on specific brands, such as "Jabra," or you can specify "default input device."

The following search finds devices that have a MOS score of less than 3.6:

source.Office365CQD.AudioDevices:"Built-In input" AND
source.Office365CQD.AverageMOS:(>0 AND <=3.6)

Headsets that are Not Certified Brands

source.Office365CQD.AudioDevices:(* AND NOT "Logitech" AND NOT "Yealink" AND NOT "Jabra" AND NOT "Sennheiser" AND NOT "Microsoft" AND NOT "Poly" AND NOT "Bose" AND NOT "EPOS" AND NOT "RealWear" AND NOT "BlueParrot")

Locations

Use the searches in this section to determine the locations where you have a high volume of calls, or where you have a high number of poor calls.

Locations with a High Number of Poor Calls

source.Office365CQD.NumberOfPoorCalls:>50 AND source.Office365CQD.groupType:City

Cities and Countries with a High Volume of Calls

This example searches for all countries with more than 100 calls. You can edit this value to suit your needs.

source.Office365CQD.groupType:Country AND source.Office365CQD.NumberOfCalls:>100

This example searches for cities with more than 20 calls. You can edit this value to suit your needs.

source.Office365CQD.groupType:City AND source.Office365CQD.NumberOfCalls:>20

This example shows how you can search for all cities within a specified country. Edit the Country Name to suit your needs.

source.Office365CQD.groupType:City AND source.Office365CQD.Name:Country Name

Offices with High Call Volume

This example searches for offices with more than 500 calls. You can edit this value to suit your needs.

source.Office365CQD.groupType:OfficeGroup AND source.Office365CQD.NumberOfCalls:>500

Offices By Name

This example searches for offices by name. This office name is set in Azure AD; verify the name that has been assigned to each location in Azure AD and edit the example shown below.

source.Office365CQD.Office:"Global Headquarters Chicago"

Geographical Regions

The examples below show how to search for Teams users in a specified geographical region:

Europe:

source.Office365CQD.groupType:Country AND (source.Office365CQD.Name:France OR source.Office365CQD.Name:Switzerland OR source.Office365CQD.Name:"United Kingdom" OR source.Office365CQD.Name:Netherlands OR source.Office365CQD.Name:Spain)

North America:

source.Office365CQD.groupType:Country AND (source.Office365CQD.Name:"United States" OR source.Office365CQD.Name:Canada OR source.Office365CQD.Name:Mexico)

Asia-Pacific:

source.Office365CQD.groupType:Country AND (source.Office365CQD.Name:India OR source.Office365CQD.Name:Australia OR source.Office365CQD.Name:Singapore)

ISPs

This section lists searches that help you find information about ISPs.

General Data Related to an ISP

This example searches for data from a specific ISP. You can create a saved search for each of your ISPs and compare their performance.

source.Office365CQD.ISPs:"ISP Name"

ISP and Call Volume

This example searches for ISPs with a high call volume. The example searches for all ISPs with more than 1000 calls, but you can edit this value to suit your needs.

source.Office365CQD.groupType:ISP AND
source.Office365CQD.NumberOfCalls:>1000

ISPs and Meetings with Poor Call Quality

This example finds meetings where a user connected through a specified ISP and experienced poor call quality.

source.Office365CQD.groupType:Meeting AND source.Office365CQD.Poor\ Call\ Attendees.UserDeviceName:"ISP Name"

ISPs with High RTT

This search finds all ISPs where Round Trip Time (RTT) was the top issue on more than 10 calls. You can edit the number of calls in this example to suit your needs.

source.Office365CQD.groupType:ISP AND source.Office365CQD.Top\ Network\ Issue.NumberOfCalls:>10 AND source.Office365CQD.Top\ Network\ Issue.Issue:RoundTrip

ISPs with High Jitter

This search finds ISPs where jitter was the top issue on more than 10 calls. You can edit the number of calls in this example to suit your needs.

source.Office365CQD.groupType:ISP AND source.Office365CQD.Top\ Network\ Issue.NumberOfCalls:>10 AND source.Office365CQD.Top\ Network\ Issue.Issue:Jitter

ISPs with High Packet Loss

This search finds ISPs where packet loss was the top issue on more than 10 calls. You can edit the number of calls in this example to suit your needs.

source.Office365CQD.groupType:ISP AND source.Office365CQD.Top\ Network\ Issue.NumberOfCalls:>10 AND source.Office365CQD.Top\ Network\ Issue.Issue:PacketLoss

ISP and average MOS

This search helps you determine whether poor voice quality is associated with a specific ISP.

source.Office365CQD.ISP:"ISP Name" AND
source.Office365CQD.AverageBandwidthEst:(>0 AND <1) AND
source.Office365CQD.AverageMOS:(>0 AND <=3.6)

Meetings

This section lists searches that help you find information about meetings.

User Devices Connected to Poor Meetings through a Specified ISP

source.Office365CQD.groupType:Meeting AND source.Office365CQD.Poor\ Call\ Attendees.UserDeviceName:"<ISP Name>"

Large Meetings where a Specified Number of Users had Poor Calls

This search finds meetings with 50 or more participants, where 3 or more users experienced poor call quality. You can edit these parameters to meet your needs.

source.Office365CQD.groupType:Meeting AND source.Office365CQD.Number\ Of\ Attendees:>=50 AND source.Office365CQD.Number\ Of\ Attendees\ With\ Poor\ Calls:>=3

Large Meetings

This search finds meetings with 50 or more participants. You can edit this value to meet your needs.

source.Office365CQD.groupType:Meeting AND source.Office365CQD.Number\ Of\ Attendees:>=50

Meetings with Poor RTT

source.Office365CQD.Poor\ Call\ Attendees.PoorCallDetails:RoundTrip

Meetings with Jitter

source.Office365CQD.Poor\ Call\ Attendees.PoorCallDetails:Jitter

Meetings with Packet Loss

source.Office365CQD.Poor\ Call\ Attendees.PoorCallDetails:PacketLoss

Meetings with a Low Video Frame Rate

source.Office365CQD.Poor\ Call\ Attendees.PoorCallDetails:VideoFrameRateAvg

Meetings with Video Frame Loss

source.Office365CQD.Poor\ Call\
Attendees.PoorCallDetails:VideoLocalFrameLossPercentageAvg

Meetings with Alerts

source.Office365CQD.MeetingName:* AND
source.Office365CQD.CallClassification:Failure

Meetings with Alerts, by Country

source.Office365CQD.MeetingName:* AND
source.Office365CQD.CallClassification:Failure AND
source.Office365CQD.ClientCountry:Canada

All Meetings

source.Office365CQD.MeetingName:*

source.Office365CQD.MeetingName:* AND
source.Office365CQD.ClientCountry:Canada

Meeting Organized or Attended by a User

source.Office365CQD.groupType:Meeting AND (source.Office365CQD.Name:"<User
Display Name>" OR source.Office365CQD.Poor\ Call\
Attendees.UserDisplayName:"<User Display Name>")

Meetings that Occurred at a Specific Date or Time

Use the examples below to search for meetings that occurred on a specific date, or
at a specific time. These searches use sample dates and times to show you the
correct format to use. In the second example, which searches for meetings that
occurred at 3pm on the specified date, you can see that time is specified in a 24h
format as defined in ISO 8601.

source.Office365CQD.groupType:Meeting AND source.Office365CQD.Meeting\
StartTime:2022-07-12

source.Office365CQD.groupType:Meeting AND source.Office365CQD.Meeting\
StartTime:2022-07-12T15

Meeting Rooms

This section lists searches that help you find information about meeting room devices.

Find Meeting Room Devices

This example searches for all meeting room devices.

source.Office365.deviceType:*

To find specific devices, you can replace the wildcard (*) with a known device type, such as:

- collaborationBar
- ipPhone
- sip
- teamsDisplay
- teamsPanel
- teamsRoom
- touchConsole

Search Based on Device Properties

The following queries are examples of the device properties that you can search for. You can edit these examples to suit your needs.

source.Office365.hardwareDetail.manufacturer:*

source.Office365.hardwareDetail.manufacturer:"<manufacturer name>"

source.Office365.hardwareDetail.manufacturer:"<manufacturer name>"

source.Office365.hardwareDetail.model:*

source.Office365.hardwareDetail.model:"<model name>"

source.Office365.hardwareDetail.model:"<model name>"

source.Office365.hardwareDetail.macAddresses:ethernet

source.Office365.hardwareDetail.macAddresses:wifi

source.Office365.hardwareDetail.macAddresses:<MAC Address>

source.Office365.Place.displayName:*

source.Office365.Place.displayName:"<meeting room display name>"

source.Office365.Place.displayName:"<Room Name>"

source.Office365.Place.phone:>0

source.Office365.Place.phone:"<phone number>"

source.Office365.Place.capacity:>0

source.Office365.Place.capacity:>=20

source.Office365.Place.address.city:>0

source.Office365.Place.address.city:"<city name>"

source.Office365.Place.address.countryOrRegion:>0

source.Office365.Place.address.countryOrRegion:ES

source.Office365.Place.address.countryOrRegion:US

Search for Disconnected Peripherals

The following queries are examples of how you can search for meeting rooms and IP phones that have disconnected peripherals.

source.Office365.DeviceHealth.peripheralsHealth.roomCameraHealth.connection.connectionStatus:disconnected

source.Office365.DeviceHealth.peripheralsHealth.speakerHealth.connection.connectionStatus:disconnected

source.Office365.DeviceHealth.peripheralsHealth.displayHealth.connection.connectionStatus:disconnected

source.Office365.DeviceHealth.peripheralsHealth.microphoneHealth.connection.connectionStatus:disconnected

Meeting Rooms and IP Phones with Outdated Software

source.Office365.DeviceHealth.softwareUpdateHealth.adminAgentSoftwareUpdateStatus.softwareFreshness:(* AND NOT latest)

source.Office365.DeviceHealth.softwareUpdateHealth.companyPortalSoftwareUpdateStatus.softwareFreshness:(* AND NOT latest)

source.Office365.DeviceHealth.softwareUpdateHealth.teamsClientSoftwareUpdateStatus.softwareFreshness:(* AND NOT latest)

source.Office365.DeviceHealth.softwareUpdateHealth.firmwareSoftwareUpdateStatus.softwareFreshness:(* AND NOT latest)

source.Office365.DeviceHealth.softwareUpdateHealth.partnerAgentSoftwareUpdateStatus.softwareFreshness:(* AND NOT latest)

Call Quality Metrics and Connection Type

This section lists searches that help you find information about call quality metrics and the connection type used for the call.

Number of Dropped Streams by City

The following search lists all cities where dropped streams affected call quality.

source.Office365CQD.DroppedStreamCount:>=3 and
source.Office365CQD.NumberOfDroppedStreams:>=30 AND
source.Office365CQD.groupType:City

Number of Dropped Streams by ISP

The following search lists all ISPs that had more than 40 dropped streams. You can edit this value to suit your needs.

source.Office365CQD.NumberOfDroppedStreams:>=40 AND
source.Office365CQD.groupType:ISP

Number of Dropped Streams by City and Country

To use the example below, edit the country name.

source.Office365CQD.NumberOfDroppedStreams:>=3 AND
source.Office365CQD.groupType:City AND source.Office365CQD.Name:<Country
name>

Number of Dropped Streams by ISP and Number of Devices

The following example shows how to search for an ISP that had more than 40 dropped streams and more than 300 user devices. The high number of user devices in this example illustrates how you can set this value to exclude home users or small offices from your search. You can edit these values to meet you needs.

source.Office365CQD.NumberOfDroppedStreams:>=40 AND
source.Office365CQD.groupType:ISP AND
source.Office365CQD.NumberOfDevices:>=300

ISPs with Round Trip Time as the Top Issue

The following example looks for all ISPs where more than 10 poor calls were caused by round trip time. You can adjust the number to meet your needs.

source.Office365CQD.groupType:ISP AND source.Office365CQD.Top\ Network\
Issue.NumberOfCalls:>10 AND source.Office365CQD.Top\ Network\
Issue.Issue:RoundTrip

ISPs with Jitter as the Top Issue

The following example looks for all ISPs where more than 10 poor calls were caused by jitter. You can adjust the number to meet your needs.

source.Office365CQD.groupType:ISP AND source.Office365CQD.Top\ Network\
Issue.NumberOfCalls:>10 AND source.Office365CQD.Top\ Network\ Issue.Issue:Jitter

ISPs with Packet Loss as the Top Issue

The following example looks for all ISPs where more than 10 poor calls were caused by packet loss. You can adjust the number to meet your needs.

source.Office365CQD.groupType:ISP AND source.Office365CQD.Top\ Network\ Issue.NumberOfCalls:>10 AND source.Office365CQD.Top\ Network\ Issue.Issue:PacketLoss

TCP Calls

Use the following search to identify calls that used TCP as the transport protocol.

source.Office365CQD.groupType:TCPCalls

Video Calls

This section lists searches that help you find information about video calls.

Video as Poor Call Reason

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg)

Video Errors in a Specified Country

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND source.Office365CQD.ClientCountry:"<Country Name>"

Video Errors in a Specified City

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND source.Office365CQD.ClientCity:"<City Name>"

Video Errors in Peer-to-Peer Calls

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND source.Office365CQD.SessionType:P2P

Video Errors in Conference Calls

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND source.Office365CQD.SessionType:Conf

Video Errors and Poor WiFi Signal Strength

This search identifies calls with video errors where the WiFi signal strength was less than 80%. You can edit this value to suit your needs.

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND source.Office365CQD.ClientWifiSignalStrength:(>0 AND <80)

Video Based Screen Sharing (VBSS) with a Low Video Frame Rate

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND (source.Office365CQD.ForwardVbssVideoFrameRate:(>0 AND <1) OR source.Office365CQD.ReverseVbssVideoFrameRate:(>0 AND <1))

Video Error with Frame Loss

source.Office365CQD.PoorReason:(VideoFrameRateAvg OR VideoLocalFrameLossPercentageAvg) AND (source.Office365CQD.ReverseVideoLocalFrameLossPct:(>0 AND <7) OR source.Office365CQD.ReverseVideoLocalFrameLossPct:(>0 AND <7))

PSTN Calls

This section lists searches that help you find information about PSTN calls.

Groups or Users Involved in PSTN Calls Greater than 60 Minutes

source.Office365CQD.PSTNCallsTotalMinutes:>60

Direct Routing Calls in Specified Countries

source.Office365CQD.Number\ Of\ Direct\ Routing\ Calls:>0 ANDsource.Office365CQD.groupType:Country

PSTN Trunk with Failed Calls

source.Office365CQD.groupType:PSTNTrunk AND source.Office365CQD.Failed\ Call\ Reasons.NumberOfCalls:>=5

PSTN Trunk with Poor Calls

source.Office365CQD.groupType:PSTNTrunk AND source.Office365CQD.Poor\ Call\ Reasons.NumberOfCalls:>=5

Find the Poor Call Reasons on all PSTN calls

source.Office365CQD.PoorReason:* AND
source.Office365CQD.PSTNConnectivityType:(DirectRouting OR CallingPlan OR
OperatorConnect)

Microsoft 365 Services and Workloads

This section lists searches that help you find information about your Microsoft 365
services.

Service Health—All Services

source.Office365.Service:*

Services with Performance Issues

source.Office365.Service:* AND source.Office365.Status:ServiceDegradation

Services with Correction Action in Progress

source.Office365.Service:* AND source.Office365.Status:ExtendedRecovery

Services Operating Normally

source.Office365.Service:* AND source.Office365.Status:ServiceOperational

Availability History of Services

This example identifies services where the availability history shows more than
three issues. You can edit this value to suit your needs.

source.Office365.Service:* AND
source.Office365.AvailabilityHistory.NumberOfIssues:>=3

Workloads Tested by Vantage DX Monitoring

The following search finds all workloads that are tested by Vantage DX Monitoring.

source.Gizmo.appAlias:*

You can also specify the workload, as shown in the examples below.

source.Gizmo.appAlias:OneDrive

source.Gizmo.appAlias:"Teams Advanced"

Microsoft 365 Licenses

This section lists searches that help you find information about your Microsoft licenses.

All Microsoft 365 Licenses

source.Office365.LicenseName:*

Specific Microsoft 365 Licenses

You can search for licenses using the SKU part number, the SKU GUID, or the license name specified by Microsoft.

If you use the license name, be aware that it can vary, depending on how the license was purchased. For example, licenses sold in combinations may have different identifiers. You can find more information about license naming in the Microsoft documentation:

https://learn.microsoft.com/en-us/azure/active-directory/enterprise-users/licensing-service-plan-reference

The following examples show different ways that you can search for licenses:

source.Office365.LicenseName:"Exchange Online Plan 1"

source.Office365.SkuPartNumber:"EXCHANGESTANDARD"

source.Office365.Sku:4b9405b0-7788-4568-add1-99614e613b69

Available Licenses

The following example shows how you can search for applications that have between 0 and 20 remaining licenses. You can edit this value range to suit your needs.

source.Office365.LicenseName:* AND source.Office365.AvailableLicenses:(>0 AND <=20)

Service Plans

The following example shows how you can search for all licenses that include a specified service plan. This example uses the Exchange Online plan, but you can

edit this value to suit your needs.

source.Office365.ServicePlans.ServicePlanName:"Exchange Online"

Call Quality Metrics

VDX Analytics retrieves device-level metrics from the Microsoft CQD integration. The metrics are averaged over all the call streams for the device during the data collection window. Video frame rates are averaged separately for video sessions and for screen sharing sessions, and the highest average frame rate is displayed.

The following table lists the metrics that VDX Analytics displays for each device.

Table 43: Call Quality Metrics

Metric	Description
Last call time	The time of the last call on this device.
Client forward jitter	The jitter from the client to the destination.
Client forward RTT	The round-trip time from the client to the destination.
Client forward video frame rate	The video frame rate from the client to the destination.
Client reverse jitter	The jitter from the destination to the client.
Client reverse RTT	The round-trip time from the destination to the client
Client reverse video frame rate	The video frame rate from the destination to the client.
Average MOS	A prediction of end-user audio quality experience. It is based on latency, the packet loss, jitter, and the codec used.
Call times	A list of calls, with their start and end times.
Number of poor calls	The number of calls with poor voice quality that occurred during the data collection period.
Poor call times	The start and end times of calls with poor voice quality.

Metric	Description
Dropped streams call times	The start and end times when call streams were dropped. Calls do not necessarily fail when call streams are dropped. For example, the video stream may drop but the audio stream may continue.
Failed calls times	The start and end times when calls failed.

Microsoft Raw Properties

The components that VDX Analytics creates contain a wide range of raw properties that are retrieved from the Microsoft Call Quality Dashboard (CQD) and your Microsoft 365 services. You can open a component to view its raw properties, and you can search on any of the raw properties that VDX Analytics retrieves. The search must be based on the field name of the property, which is determined by Microsoft and may differ from the name displayed in the VDX Analytics interface. To verify the field name to use in a search, hover your mouse over the name of the property; a text box displays the field name. For suggested searches, see "Custom Searches" on page 117.

Use the following table to navigate to sections that provide information about the raw properties that are included in each component.

Table 44: Raw Properties

Topic	Description	Microsoft CQD	Microsoft 365
"Users and Devices" on page 139	This section lists the raw properties for users and user devices.	✓	—
"Call Types" on page 146	This section lists the raw properties for conferences, TCP calls, and near-time calls.	✓	—
"Locations" on page 153	This section lists the raw properties for countries, cities, dynamic offices, and Microsoft data centers.	✓	—
"Network Information" on page 159	This section lists the raw properties for ISPs and calls where network switching occurred.	✓	—

Topic	Description	Microsoft CQD	Microsoft 365
"Call Conditions" on page 165	This section lists the raw properties for groups that aggregate data about calls that had low MOS, poor WIFI strength, or low client bandwidth. It also provides information about call rating groups.	✓	—
"PSTN-Connected Calls" on page 171	This section lists the raw properties retrieved from devices that participated in direct routing, calling plan, and operator connect calls.	✓	—
"Meeting Rooms" on page 175	Meeting Rooms	✓	✓
"Meeting Room Devices" on page 177	Meeting Room Devices		✓
"Subscriptions" on page 177	Subscriptions		✓
"Licenses" on page 177	Licenses		✓
"Services" on page 178	Services		✓

Users and Devices

When VDX Analytics retrieves data from your Microsoft CQD, it creates objects for each user and each user device.

- **User**—These objects provide information about the status of the user.
- **User Devices**—These objects provide information about a user's experience from a specific location and network connection type.

The following table lists the raw properties that are retrieved for each of these objects.

Table 45: Raw Properties for Users and User Devices

Property	Users	User Devices
Id	✓	✓
Name	✓	✓
Client OS	—	✓
Client OS Detail	—	✓
Client CPU	—	✓
User Agent	—	✓
Email	✓	✓
User Display Name	—	✓
Office *For User Devices, this property is called User Office.	✓	✓
Department	✓	✓
External User (true/false)	✓	✓
IP Address List	—	✓
Connection Type	—	✓
Average Bandwidth Est	—	✓
Locations *for users, one field indicates city, country *for user devices, there are separate fields for city, region, country	✓	✓
ISPs	✓	✓
Average Bandwidth Est	—	✓
Audio Devices	—	✓

Property	Users	User Devices
Audio Codecs	—	✔
Video Devices	—	✔
Video Codecs	—	✔
Devices • Name • Last Call Time • Number Of Calls • Number Of Poor Calls • IP Address List	✔	—
Active Use For Users and User Devices: • Call Date • Number Of Calls • Number Of Poor Calls Additional information for User Devices: • Active Users • PSTN Outbound Minutes • Number Of Direct Routing Calls • Outgoing Dial Delay	✔	✔
PSTN Carriers	✔	✔
PSTN Operator Connect	—	✔
PSTN Trunks	✔	✔
Last Call Time	—	✔
Number Of Devices	✔	—
Number Of Calls	✔	✔
Internal Calls	✔	—

Property	Users	User Devices
External End Point Calls	✓	—
Number Of Direct Routing Calls	✓	✓
Number Of Operator Connected Calls	✓	✓
Number of PSTN Calls	✓	✓
Number Of P2P Calls	✓	✓
Number Of Conference Calls	✓	✓
Number Of Video Calls	✓	✓
Number Of Cloud Calls	✓	✓
Number Of UDP Calls	—	✓
Number Of TCP Calls	—	✓
Number Of Wired Calls	✓	—
Number Of Wifi Calls	✓	—
Number Of MobileBB Calls	✓	—
Number Of Failed Calls	✓	—
Number Of Failed Direct Routing Calls	✓	✓
Number Of Failed PSTN Calls	—	✓
Number Of Failed Operator Connect Calls	✓	✓
Number Of Failed Cloud Calls	✓	✓
Number Of Failed Conference Calls	✓	✓
Number Of Failed P2P Calls	✓	✓

Property	Users	User Devices
Number Of Failed Video Calls	✓	✓
Number Of Failed TCP Calls	—	✓
Number Of Failed UDP Calls	—	✓
Number Of Poor PSTN Calls	✓	✓
Number Of Poor Direct Routing Calls	✓	✓
Number Of Poor Operator Connect Calls	✓	✓
Number Of Poor P2P Calls	✓	✓
Number Of Poor Conference Calls	✓	✓
Number Of Poor Video Calls	✓	✓
Number Of Poor Cloud Calls	✓	✓
Number Of Poor UDP Calls	—	✓
Number Of Poor TCP Calls	—	✓
Number Of Poor Wired Calls	✓	—
Number Of Poor Wifi Calls	✓	—
Number Of Poor MobileBB Calls	✓	—
Number Of Failed Wired Calls	✓	
Number Of Failed Wifi Calls	✓	
Number Of Failed MobileBB Calls	✓	
Number Of PSTN Inbound Calls	✓	✓
Number Of Direct Routing Inbound Calls	✓	✓

Property	Users	User Devices
Number Of Operator Connect Inbound Calls	✓	✓
Number Of PSTN Outbound Calls	✓	✓
Number Of Direct Routing Outbound Calls	✓	✓
Number Of Operator Connect Outbound Calls	✓	✓
PSTN Calls Total Minutes	✓	✓
Forward Jitter	—	✓
Forward RTT	—	✓
Forward Package Loss	—	✓
Forward Video Frame Rate	—	✓
Forward Video Local Frame Loss Percentage	—	✓
Reverse Jitter	—	✓
Reverse RTT	—	✓
Reverse Package Loss	—	✓
Reverse Video Frame Rate	—	✓
Reverse Video Local Frame Loss Percentage	—	✓
Average MOS	—	✓
NT Jitter	—	✓
NT RTT	—	✓
NT Packet Loss	—	✓
NT Bandwidth	—	✓

Property	Users	User Devices
NT Wifi Strength	—	✓
Call Times • Start Time • End Time • End Point User • Meeting • Call Type • Phone Number • Post Dial Delay • Detail	—	✓
Poor Calls *For User Devices, this property is called Number of Poor Calls.	✓	✓
Poor Call Reasons • Issue • Number Of Calls	✓	✓
Top Network Issue • Issue • Number Of Calls	✓	✓
Poor Call Times • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	—	✓

Property	Users	User Devices
Dropped Streams Call Times • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	—	✓
Number Of Failed Calls	—	✓
Failed Calls Times • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	—	✓
Microsoft Datacenters • Name • Number Of Calls	—	✓
Active Alert (true/false)	—	✓
External End Points • Name • Number Of Calls	✓	✓
CQD Component Type	✓	✓

Call Types

When VDX Analytics retrieves data from your Microsoft CQD, it creates groups for the following types of calls:

- **Conference Calls/Meetings**—Teams conference calls display as groups. The groups contain all of the user devices that were part of that meeting. You can view the group properties to see which users experienced poor call quality.
- **TCP Calls**—TCP call groups display all the users that make and receive TCP calls.
- **Near-Time Calls**—These groups aggregate metrics for calls that occurred within the last two hours.

The following table lists the raw properties that are retrieved for each of these groups.

Table 46: Raw Properties by Call Type

Property	Conference / Meeting	TCP	Near-Time
Id	✓	✓	✓
Name	✓	✓	✓
IP Address	✓	✓	✓
Top 25 Locations	✓	✓	✓
Top 25 Users	✓	✓	✓
Top 25 ISPs	✓	✓	✓
Number Of Devices	✓	✓	✓
Number Of PSTN Devices	✓	✓	✓
Number Of Calls	✓	✓	✓
Number Of Direct Routing Calls	✓	✓	✓
Number Of PSTN Calls	✓	✓	✓
Number Of P2P Calls	✓	✓	✓
Number Of Conference Calls	✓	✓	✓
Number Of Video Calls	✓	✓	✓
Number Of Cloud Calls	✓	✓	✓

Property	Conference / Meeting	TCP	Near-Time
Number Of Wired Calls	✓	✓	✓
Number Of Wifi Calls	✓	✓	✓
Number Of MobileBB Calls	✓	✓	✓
Number Of UDP Calls	✓	✓	✓
Number Of TCP Calls	✓	✓	✓
Number Of TCP Calls	✓	✓	✓
Number Of Failed Direct Routing Calls	✓	✓	✓
Number Of Failed PSTN Calls	✓	✓	✓
Number Of Failed Cloud Calls	✓	✓	✓
Number Of Failed Conference Calls	✓	✓	✓
Number Of Failed P2P Calls	✓	✓	✓
Number Of Failed Video Calls	✓	✓	✓
Number Of Failed Wired Calls	✓	✓	✓
Number Of Failed Wifi Calls	✓	✓	✓
Number Of Failed MobileBB Calls	✓	✓	✓
Number Of Failed UDP Calls	✓	✓	✓
Number Of Failed TCP Calls	✓	✓	✓
Number Of Poor PSTN Calls	✓	✓	✓
Number Of Poor Direct Routing Calls	✓	✓	✓

Property	Conference / Meeting	TCP	Near-Time
Number Of Poor P2P Calls	✓	✓	✓
Number Of Poor Conference Calls	✓	✓	✓
Number Of Poor Video Calls	✓	✓	✓
Number Of Poor Cloud Calls	✓	✓	✓
Number Of Poor Wired Calls	✓	✓	✓
Number Of Poor Wifi Calls	✓	✓	✓
Number Of Poor MobileBB Calls	✓	✓	✓
Number Of Poor UDP Calls	✓	✓	✓
Number Of Poor TCP Calls	✓	✓	✓
Number Of PSTN Inbound Calls	✓	✓	✓
Number Of Direct Routing Inbound Calls	✓	✓	✓
Number Of PSTN Outbound Calls	✓	✓	✓
Number Of Direct Routing Outbound Calls	✓	✓	✓
PSTN Calls Total Minutes	✓	✓	✓
External End Point Calls	✓	✓	✓
Number Of Poor Calls	✓	✓	✓
Windows Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓

Property	Conference / Meeting	TCP	Near-Time
Android Calls			
• Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓
IOS Calls			
• Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓
MacOS Calls			
• Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓

Property	Conference / Meeting	TCP	Near-Time
Daily Active Users • Call Date • Active Users • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Number Of PSTN Calls • PSTN Inbound Minutes • PSTN Outbound Minutes • Number Of Direct Routing Calls • Direct Routing Inbound Minutes • Direct Routing Outbound Minutes • Number Of Operator Connect Calls • Operator Connect Inbound Minutes • Operator Connect Outbound Minutes • Outgoing Dial Delay • Incoming Dial Delay • Number Of Failed PSTN Calls	✓	✓	✓
Top 5 User Issues: • User Display Name • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓
Poor Call Reasons: • Issue: Jitter • Number Of Calls	✓	✓	✓
Top Network Issue • Issue • Number Of Calls	✓	✓	✓

Property	Conference / Meeting	TCP	Near-Time
Last 30 Poor Calls: • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓	✓
Number Of Dropped Streams	✓	✓	✓
Last 30 Dropped Calls • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓	✓
Last 30 Failed Calls • Start Time • End Time • Caller Display Name • End Point User	✓	✓	✓
Microsoft Datacenters • Name • Number Of Calls	✓	✓	✓
External End Points: • Name • Number Of Calls	✓	✓	✓

Property	Conference / Meeting	TCP	Near-Time
Group Type	✓	✓	✓
Active Alert (true/false)	✓	✓	✓

Locations

When VDX Analytics retrieves data from your Microsoft CQD, it creates groups for the following types of locations:

- **Country**—These groups are based on the location of user devices.
- **City**—These groups are based on the location of user devices.
- **Dynamic Offices**—A dynamic office is when three or more user devices participate in a call using the same IP address. VDX Analytics creates a group for that IP address. Devices that connect to a call from the same IP address are typically located in the same office.
- **Microsoft Datacenter**—When a Teams call is initiated, the location of the server that hosts the call is typically determined by the first user to join the call. The call is hosted by the Microsoft data center that is in the same region as the first user. VDX Analytics creates a group for each data center and displays the users who participated in calls hosted by that data center.

The following table lists the raw properties that are retrieved for each of these groups.

Table 47: Raw Properties for Locations

Property	Country	City	Dynamic Offices	Microsoft Datacenter
Id	✓	✓	✓	✓
Name	✓	✓	✓	✓
IP Address	✓	✓	✓	✓
Top 25 Locations	✓	✓	✓	✓
Top 25 Users	✓	✓	✓	✓
Top 25 ISPs	✓	✓	✓	✓
Number Of Devices	✓	✓	✓	✓
Number Of PSTN Devices	✓	✓	✓	✓

Property	Country	City	Dynamic Offices	Microsoft Datacenter
Number Of Calls	✓	✓	✓	✓
Number Of Direct Routing Calls	✓	✓	✓	✓
Number Of PSTN Calls	✓	✓	✓	✓
Number Of P2P Calls	✓	✓	✓	✓
Number Of Conference Calls	✓	✓	✓	✓
Number Of Video Calls	✓	✓	✓	✓
Number Of Cloud Calls	✓	✓	✓	✓
Number Of Wired Calls	✓	✓	✓	✓
Number Of Wifi Calls	✓	✓	✓	✓
Number Of MobileBB Calls	✓	✓	✓	✓
Number Of UDP Calls	✓	✓	✓	✓
Number Of TCP Calls	✓	✓	✓	✓
Number Of TCP Calls	✓	✓	✓	✓
Number Of Failed Direct Routing Calls	✓	✓	✓	✓
Number Of Failed PSTN Calls	✓	✓	✓	✓
Number Of Failed Cloud Calls	✓	✓	✓	✓
Number Of Failed Conference Calls	✓	✓	✓	✓
Number Of Failed P2P Calls	✓	✓	✓	✓
Number Of Failed Video Calls	✓	✓	✓	✓

Property	Country	City	Dynamic Offices	Microsoft Datacenter
Number Of Failed Wired Calls	✓	✓	✓	✓
Number Of Failed Wifi Calls	✓	✓	✓	✓
Number Of Failed MobileBB Calls	✓	✓	✓	✓
Number Of Failed UDP Calls	✓	✓	✓	✓
Number Of Failed TCP Calls	✓	✓	✓	✓
Number Of Poor PSTN Calls	✓	✓	✓	✓
Number Of Poor Direct Routing Calls	✓	✓	✓	✓
Number Of Poor P2P Calls	✓	✓	✓	✓
Number Of Poor Conference Calls	✓	✓	✓	✓
Number Of Poor Video Calls	✓	✓	✓	✓
Number Of Poor Cloud Calls	✓	✓	✓	✓
Number Of Poor Wired Calls	✓	✓	✓	✓
Number Of Poor Wifi Calls	✓	✓	✓	✓
Number Of Poor MobileBB Calls	✓	✓	✓	✓
Number Of Poor UDP Calls	✓	✓	✓	✓
Number Of Poor TCP Calls	✓	✓	✓	✓
Number Of PSTN Inbound Calls	✓	✓	✓	✓
Number Of Direct Routing Inbound Calls	✓	✓	✓	✓

Property	Country	City	Dynamic Offices	Microsoft Datacenter
Number Of PSTN Outbound Calls	✓	✓	✓	✓
Number Of Direct Routing Outbound Calls	✓	✓	✓	✓
PSTN Calls Total Minutes	✓	✓	✓	✓
External End Point Calls	✓	✓	✓	✓
Number Of Poor Calls	✓	✓	✓	✓
Windows Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
Android Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
IOS Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
MacOS Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓

Property	Country	City	Dynamic Offices	Microsoft Datacenter
Daily Active Users • Call Date • Active Users • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Number Of PSTN Calls • PSTN Inbound Minutes • PSTN Outbound Minutes • Number Of Direct Routing Calls • Direct Routing Inbound Minutes • Direct Routing Outbound Minutes • Number Of Operator Connect Calls • Operator Connect Inbound Minutes • Operator Connect Outbound Minutes • Outgoing Dial Delay • Incoming Dial Delay • Number Of Failed PSTN Calls	✓	✓	✓	✓
Top 5 User Issues: • User Display Name • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
Poor Call Reasons: • Issue: Jitter • Number Of Calls	✓	✓	✓	✓

Property	Country	City	Dynamic Offices	Microsoft Datacenter
Top Network Issue • Issue • Number Of Calls	✓	✓	✓	✓
Last 30 Poor Calls: • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓	✓	✓
Number Of Dropped Streams	✓	✓	✓	✓
Last 30 Dropped Calls • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓	✓	✓
Last 30 Failed Calls • Start Time • End Time • Caller Display Name • End Point User	✓	✓	✓	✓
Microsoft Datacenters • Name • Number Of Calls	✓	✓	✓	✓

Property	Country	City	Dynamic Offices	Microsoft Datacenter
External End Points: • Name • Number Of Calls	✓	✓	✓	✓
Group Type	✓	✓	✓	✓
Active Alert (true/false)	✓	✓	✓	✓

Network Information

When VDX Analytics retrieves data from your Microsoft CQD, it creates groups for the following network information:

- **ISP**—The ISP group is based on the service provider information for user devices.
- **Network Switching**—These groups aggregate information about calls where one of the endpoints experienced a change in the network connection. For example, if a call participant changed from a WIFI connection to a cell connection during the call, that call is included in the Network Switching group. Network switching can also occur if a call participant switches between WIFI base stations, or if a call disconnects and reconnects.

The following table lists the raw properties that are retrieved for each of these groups.

Table 48: Raw Properties for Network Information

Property	ISP	Network Switching
Id	✓	✓
Name	✓	✓
IP Address	✓	✓
Top 25 Locations	✓	✓
Top 25 Users	✓	✓
Top 25 ISPs	✓	✓
Number Of Devices	✓	✓
Number Of PSTN Devices	✓	✓

Property	ISP	Network Switching
Number Of Calls	✓	✓
Number Of Direct Routing Calls	✓	✓
Number Of PSTN Calls	✓	✓
Number Of P2P Calls	✓	✓
Number Of Conference Calls	✓	✓
Number Of Video Calls	✓	✓
Number Of Cloud Calls	✓	✓
Number Of Wired Calls	✓	✓
Number Of Wifi Calls	✓	✓
Number Of MobileBB Calls	✓	✓
Number Of UDP Calls	✓	✓
Number Of TCP Calls	✓	✓
Number Of TCP Calls	✓	✓
Number Of Failed Direct Routing Calls	✓	✓
Number Of Failed PSTN Calls	✓	✓
Number Of Failed Cloud Calls	✓	✓
Number Of Failed Conference Calls	✓	✓
Number Of Failed P2P Calls	✓	✓
Number Of Failed Video Calls	✓	✓
Number Of Failed Wired Calls	✓	✓
Number Of Failed Wifi Calls	✓	✓

Property	ISP	Network Switching
Number Of Failed MobileBB Calls	✓	✓
Number Of Failed UDP Calls	✓	✓
Number Of Failed TCP Calls	✓	✓
Number Of Poor PSTN Calls	✓	✓
Number Of Poor Direct Routing Calls	✓	✓
Number Of Poor P2P Calls	✓	✓
Number Of Poor Conference Calls	✓	✓
Number Of Poor Video Calls	✓	✓
Number Of Poor Cloud Calls	✓	✓
Number Of Poor Wired Calls	✓	✓
Number Of Poor Wifi Calls	✓	✓
Number Of Poor MobileBB Calls	✓	✓
Number Of Poor UDP Calls	✓	✓
Number Of Poor TCP Calls	✓	✓
Number Of PSTN Inbound Calls	✓	✓
Number Of Direct Routing Inbound Calls	✓	✓
Number Of PSTN Outbound Calls	✓	✓
Number Of Direct Routing Outbound Calls	✓	✓
PSTN Calls Total Minutes	✓	✓
External End Point Calls	✓	✓

Property	ISP	Network Switching
Number Of Poor Calls	✓	✓
Windows Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓
Android Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓
IOS Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓
MacOS Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓

Property	ISP	Network Switching
Daily Active Users		
• Call Date		
• Active Users		
• Number Of Calls		
• Number Of Poor Calls		
• Number Of Failed Calls		
• Number Of PSTN Calls		
• PSTN Inbound Minutes		
• PSTN Outbound Minutes		
• Number Of Direct Routing Calls		
• Direct Routing Inbound Minutes	✓	✓
• Direct Routing Outbound Minutes		
• Number Of Operator Connect Calls		
• Operator Connect Inbound Minutes		
• Operator Connect Outbound Minutes		
• Outgoing Dial Delay		
• Incoming Dial Delay		
• Number Of Failed PSTN Calls		
Top 5 User Issues:		
• User Display Name		
• Number Of Poor Calls	✓	✓
• Number Of Failed Calls		
• Top Issue		
Poor Call Reasons:		
• Issue: Jitter	✓	✓
• Number Of Calls		
Top Network Issue		
• Issue	✓	✓
• Number Of Calls		

Property	ISP	Network Switching
Last 30 Poor Calls: • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓
Number Of Dropped Streams	✓	✓
Last 30 Dropped Calls • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓
Last 30 Failed Calls • Start Time • End Time • Caller Display Name • End Point User	✓	✓
Microsoft Datacenters • Name • Number Of Calls	✓	✓
External End Points: • Name • Number Of Calls	✓	✓
Group Type	✓	✓
Active Alert (true/false)	✓	✓

Call Conditions

When VDX Analytics retrieves data from your Microsoft CQD, it creates groups for the following call conditions:

- **Low MOS**—These groups aggregate data about calls that had low MOS scores.
- **Poor WIFI Strength**—These groups aggregate data about calls that had poor WIFI connections.
- **Low Client Bandwidth**—These groups aggregate data about calls that experienced low bandwidth.
- **Call Rating**—The Call Rating is the score that users provide when they are prompted to rate the quality of a Teams call.

The following table lists the raw properties that are retrieved for each of these groups.

Table 49: Raw Properties by Call Conditions

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
Id	✓	✓	✓	✓
Name	✓	✓	✓	✓
IP Address	✓	✓	✓	✓
Top 25 Locations	✓	✓	✓	✓
Top 25 Users	✓	✓	✓	✓
Top 25 ISPs	✓	✓	✓	✓
Number Of Devices	✓	✓	✓	✓
Number Of PSTN Devices	✓	✓	✓	✓
Number Of Calls	✓	✓	✓	✓
Number Of Direct Routing Calls	✓	✓	✓	✓
Number Of PSTN Calls	✓	✓	✓	✓
Number Of P2P Calls	✓	✓	✓	✓
Number Of Conference Calls	✓	✓	✓	✓

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
Number Of Video Calls	✓	✓	✓	✓
Number Of Cloud Calls	✓	✓	✓	✓
Number Of Wired Calls	✓	✓	✓	✓
Number Of Wifi Calls	✓	✓	✓	✓
Number Of MobileBB Calls	✓	✓	✓	✓
Number Of UDP Calls	✓	✓	✓	✓
Number Of TCP Calls	✓	✓	✓	✓
Number Of TCP Calls	✓	✓	✓	✓
Number Of Failed Direct Routing Calls	✓	✓	✓	✓
Number Of Failed PSTN Calls	✓	✓	✓	✓
Number Of Failed Cloud Calls	✓	✓	✓	✓
Number Of Failed Conference Calls	✓	✓	✓	✓
Number Of Failed P2P Calls	✓	✓	✓	✓
Number Of Failed Video Calls	✓	✓	✓	✓
Number Of Failed Wired Calls	✓	✓	✓	✓
Number Of Failed Wifi Calls	✓	✓	✓	✓
Number Of Failed MobileBB Calls	✓	✓	✓	✓
Number Of Failed UDP Calls	✓	✓	✓	✓

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
Number Of Failed TCP Calls	✓	✓	✓	✓
Number Of Poor PSTN Calls	✓	✓	✓	✓
Number Of Poor Direct Routing Calls	✓	✓	✓	✓
Number Of Poor P2P Calls	✓	✓	✓	✓
Number Of Poor Conference Calls	✓	✓	✓	✓
Number Of Poor Video Calls	✓	✓	✓	✓
Number Of Poor Cloud Calls	✓	✓	✓	✓
Number Of Poor Wired Calls	✓	✓	✓	✓
Number Of Poor Wifi Calls	✓	✓	✓	✓
Number Of Poor MobileBB Calls	✓	✓	✓	✓
Number Of Poor UDP Calls	✓	✓	✓	✓
Number Of Poor TCP Calls	✓	✓	✓	✓
Number Of PSTN Inbound Calls	✓	✓	✓	✓
Number Of Direct Routing Inbound Calls	✓	✓	✓	✓
Number Of PSTN Outbound Calls	✓	✓	✓	✓
Number Of Direct Routing Outbound Calls	✓	✓	✓	✓
PSTN Calls Total Minutes	✓	✓	✓	✓

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
External End Point Calls	✓	✓	✓	✓
Number Of Poor Calls	✓	✓	✓	✓
Windows Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
Android Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
IOS Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓
MacOS Calls • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
Daily Active Users • Call Date • Active Users • Number Of Calls • Number Of Poor Calls • Number Of Failed Calls • Number Of PSTN Calls • PSTN Inbound Minutes • PSTN Outbound Minutes • Number Of Direct Routing Calls • Direct Routing Inbound Minutes • Direct Routing Outbound Minutes • Number Of Operator Connect Calls • Operator Connect Inbound Minutes • Operator Connect Outbound Minutes • Outgoing Dial Delay • Incoming Dial Delay • Number Of Failed PSTN Calls	✓	✓	✓	✓
Top 5 User Issues: • User Display Name • Number Of Poor Calls • Number Of Failed Calls • Top Issue	✓	✓	✓	✓

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
Poor Call Reasons: • Issue: Jitter • Number Of Calls	✓	✓	✓	✓
Top Network Issue • Issue • Number Of Calls	✓	✓	✓	✓
Last 30 Poor Calls: • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓	✓	✓
Number Of Dropped Streams	✓	✓	✓	✓
Last 30 Dropped Calls • Start Time • End Time • Caller Display Name • End Point User • Call Type • Phone Number • Post Dial Delay • Detail • Meeting	✓	✓	✓	✓
Last 30 Failed Calls • Start Time • End Time • Caller Display Name • End Point User	✓	✓	✓	✓

Property	Low MOS	Poor WIFI Strength	Low Client Bandwidth	Call Rating
Microsoft Datacenters • Name • Number Of Calls	✓	✓	✓	✓
External End Points: • Name • Number Of Calls	✓	✓	✓	✓
Group Type	✓	✓	✓	✓
Active Alert (true/false)	✓	✓	✓	✓

PSTN-Connected Calls

When VDX Analytics retrieves data from your Microsoft CQD, it creates groups for the following types of PSTN calls:

- **PSTN Carrier**—These groups display information about user devices that are associated with calling plan calls.
- **PSTN Trunk**—These groups display information about user devices that are associated with direct routing calls.
- **PSTN Operator Connect**—These groups display information about user devices that are associated with operator connect calls.

The following table lists the raw properties that are retrieved for each of these groups.

Table 50: Raw Properties for Teams PSTN Calls

Property	PSTN Carrier	PSTN Trunk	PSTN Operator Connect
Id	✓	✓	✓
Name	✓	✓	✓
PSTN MP Locations	✓	✓	✓
Top 25 Users	✓	✓	✓
Number Of Users	✓	✓	✓

Property	PSTN Carrier	PSTN Trunk	PSTN Operator Connect
Daily Active Users • Call Date • Active Users • Number Of PSTN Calls • PSTN Inbound Minutes • PSTN Outbound Minutes • Number Of Direct Routing Calls • Direct Routing Inbound Minutes • Direct Routing Outbound Minutes • Number Of Operator Connect Calls • Operator Connect Inbound Minutes • Operator Connect Outbound Minutes • Outgoing Dial Delay • Incoming Dial Delay • Number Of Failed PSTN Calls	✓	✓	✓
Top 25 Locations	✓	✓	✓
Number Of PSTN Devices	✓	✓	✓
Number Of PSTN Calls	✓	✓	✓
Number Of Failed PSTN Calls	✓	✓	✓
Number Of Poor Direct Routing Calls	✓	✓	✓
Number Of Poor PSTN Calls	✓	✓	✓
Number Of Poor Operator Connect Calls	✓	✓	✓
Number Of PSTN Inbound Calls	✓	✓	✓

Property	PSTN Carrier	PSTN Trunk	PSTN Operator Connect
Number Of PSTN Outbound Calls	✓	✓	✓
Number Of Operator Connect Inbound Calls	✓	✓	✓
Number Of Operator Connect Outbound Calls	✓	✓	✓
Number Of Direct Routing Calls	✓	✓	✓
Number Of Operator Connect Calls	✓	✓	✓
Number Of Failed Direct Routing Calls	✓	✓	✓
Number Of Failed Operator Connect Calls	✓	✓	✓
Number Of Direct Routing Outbound Calls	✓	✓	✓
Number Of Direct Routing Inbound Calls	✓	✓	✓
Number Of Wired Calls	✓	✓	✓
Number Of Wifi Calls	✓	✓	✓
Number Of MobileBB Calls	✓	✓	✓
Number Of Poor Wired Calls	✓	✓	✓
Number Of Poor Wifi Calls	✓	✓	✓
Number Of Poor MobileBB Calls	✓	✓	✓
Number Of Failed Wired Calls	✓	✓	✓
Number Of Failed Wifi Calls	✓	✓	✓
Number Of Failed MobileBB Calls	✓	✓	✓

Property	PSTN Carrier	PSTN Trunk	PSTN Operator Connect
PSTN Calls Total Minutes	✓	✓	✓
Top 5 User Poor Call Issues: • User Display Name • Number Of Failed Calls • Top Issue	✓	✓	✓
Top 5 User Failed Call Issues: • User Display Name • Number Of Failed Calls: 3 • Top Issue	✓	✓	✓
Last 30 Poor Calls • Start Time • End Time • Caller Display Name • Phone Number • Post Dial Delay • Detail	✓	✓	✓
Last 30 Failed Calls • Start Time • End Time • Caller Display Name • Detail	✓	✓	✓
Poor Call Reasons • Issue • Number Of Calls	✓	✓	✓
Failed Call Reasons • Issue • Number Of Calls	✓	✓	✓
Microsoft Datacenters	✓	✓	✓
Group Type	✓	✓	✓

Meeting Rooms

The following table lists the raw properties that are retrieved from each integration. We recommend that you configure a consolidation rule for meeting rooms, so that all of these properties are available to you in one component. For information about how to configure a consolidation rule, see "Configure Meeting Room Data" on page 18.

Table 51: Raw Properties for Users and User Devices

Property	CQD	M365
Id	✓	✓
Name	✓	—
Email	✓	—
Office	✓	—
Location	✓	—
ISPs	✓	—
Devices • Name • Last Call Time • Number Of Calls • Number Of Poor Calls • IP Address List	✓	—
Active Use • Call Date • Number Of Calls • Number Of Poor Calls	✓	—
Number Of Devices	✓	—
Number Of Calls	✓	—
Number of Conferences	✓	—
Number of Video Calls	✓	—
Number of Cloud Calls	✓	—

Property	CQD	M365
Number of Wired Calls	✓	—
Number of Poor Conference Calls	✓	—
Number of Poor Video Calls	✓	—
Number of Poor Cloud Calls	✓	—
Poor Call Reasons	✓	—
Display name	—	✓
Teams Room License	—	✓
Email Address	—	✓
Usage Location	—	✓
User Principal Name	—	✓
Proxy Addresses	—	✓
Place • Id • Email Address • Display Name • Nickname • Address	—	✓
Meeting Room Devices • Id • Display Name • Device Type • Hardware Details • Health Status • Activity State • Software Details	—	✓

Meeting Room Devices

The following raw properties for meeting room devices are retrieved from the Microsoft 365 integration.

- Id
- Device Type
- Health Status
- Activity State
- Created Date Time
- Last Modified Date Time
- Hardware Detail
    - Serial Number
    - Unique Id
    - MAC Addresses
    - Manufacturer
    - Model
    - Current User
    - Device Health

Subscriptions

The Subscription component contains the following raw properties, which are retrieved from the Microsoft 365 integration:

- Id
- Group Type
- Organization Name
- Organization Domain Name
- Number of Subscriptions
- Licenses
- Active and Inactive for each license type (Eg Exchange Active, Exchange Inactive)

Licenses

The License component contains the following raw properties, which are retrieved from the Microsoft 365 integration:

- Id
- SKU
- SKU Part Number
- License Name
- Applies To
- Purchased Licenses

- Assigned Licenses
- Available Licenses
- Service Plans

Services

The Services component contains the following raw properties, which are retrieved from the Microsoft 365 integration:

- Service
- Status
- Id
- Advisories
- Availability History

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