

Troubleshooting Teams Call Quality Issues with Martello Vantage DX

The Challenge

As Microsoft Teams call quality relies heavily on your network but also the users' devices, the network of your third-party provider *and* the one of the person you call. Therefore it can be difficult to understand why Teams meetings or calls were poor and who was *actually* responsible for the quality.

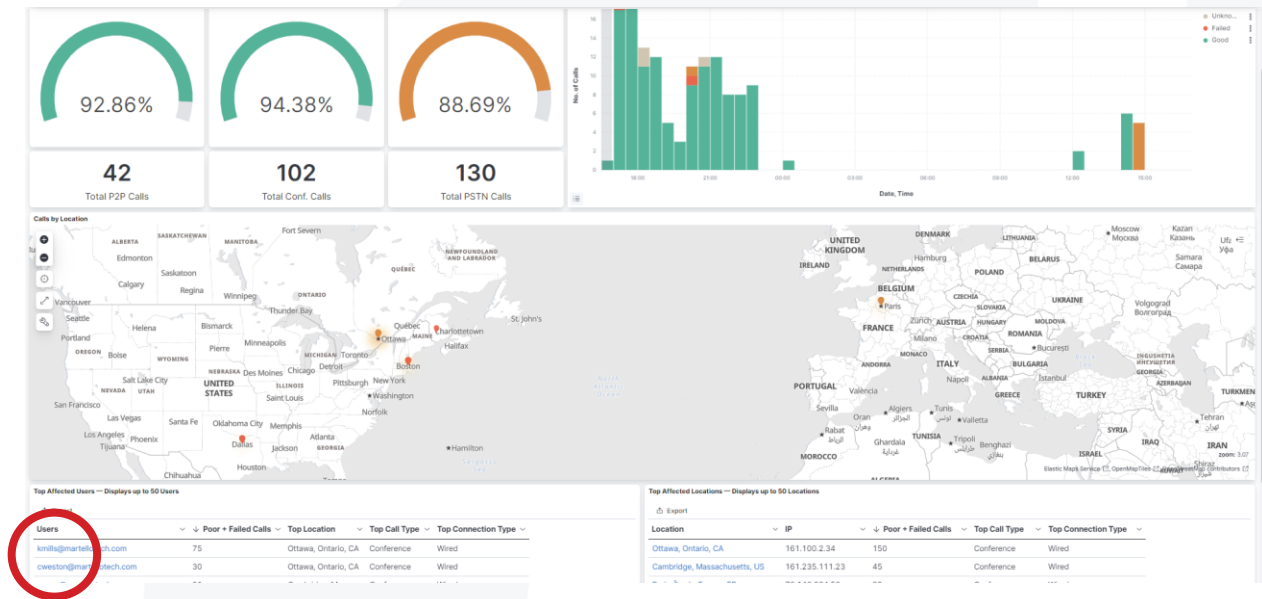
Overview

Walk through how you can easily discover all the parameters of a Microsoft Teams meeting or call to determine what the issue *is* and who owns it. For IT teams this quickly speeds up your mean time to repair.

Let's Get Started!

Let's say that you want to investigate and understand why a specific user has had many poor Microsoft Teams calls.

From the overview dashboard, let's select one of the top affected users by clicking on its name then "+" then go to users dashboard.



Now in the users dashboard you can easily spot the table that highlights the last calls with issues of this specific user:

Recent Poor/Failed Calls — Displays up to 50 Calls

Export

Call ID	Date	Start Time	End Time	Status	Call Type	Reason(s)	Total Users	Affected Users	Internal Users	External Users	Meeting Room
30383336-3739-3533-3136-303030303032	2023-01-19	15:26	15:30	Poor	Conference	Packet Loss (100 %), Round Trip Time (67 %), Vide...	3	3	3	0	-
30383336-3739-3433-3932-303030303032	2023-01-19	15:22	15:26	Poor	Conference	Round Trip Time (100 %), Packet Loss (67 %), Vide...	3	3	2	1	-
30383336-3739-3433-3638-303030303032	2023-01-19	15:18	15:22	Poor	Conference	Round Trip Time (100 %), Video Frame Rate (100 %...	4	4	4	0	-
30383336-3739-3433-3434-303030303032	2023-01-19	15:14	15:18	Poor	Conference	Packet Loss (100 %), Video Frame Rate (100 %), R...	4	4	4	0	-
30383336-3739-3433-3230-303030303032	2023-01-19	15:10	15:14	Poor	Conference	Packet Loss (100 %), Video Frame Rate (100 %), R...	3	3	3	0	-
30383336-3739-3333-3936-303030303032	2023-01-19	15:06	15:10	Poor	Conference	Packet Loss (100 %), Round Trip Time (67 %), Vide...	3	3	3	0	-
30383336-3739-3333-3732-303030303032	2023-01-19	15:02	15:06	Poor	Conference	Round Trip Time (100 %), Packet Loss (67 %), Vide...	3	3	2	1	-
30383336-3739-3333-3438-303030303032	2023-01-19	14:58	15:02	Poor	Conference	Round Trip Time (100 %), Video Frame Rate (100 %...	4	4	4	0	-
30383336-3739-3333-3234-303030303032	2023-01-19	14:54	14:58	Poor	Conference	Packet Loss (100 %), Video Frame Rate (100 %), R...	4	4	4	0	-
30383336-3739-3333-3030-303030303032	2023-01-19	14:50	14:54	Poor	Conference	Packet Loss (100 %), Video Frame Rate (100 %), R...	3	3	3	0	-

Select the second one. Depending on the time you are testing the product, the user you have chosen and the call you are selecting, the result will vary.

To open a call, simply click on it, the “+” then go to call dashboard.

You are now in our call dashboard.

The first table gives you a summary of what happen during that call:

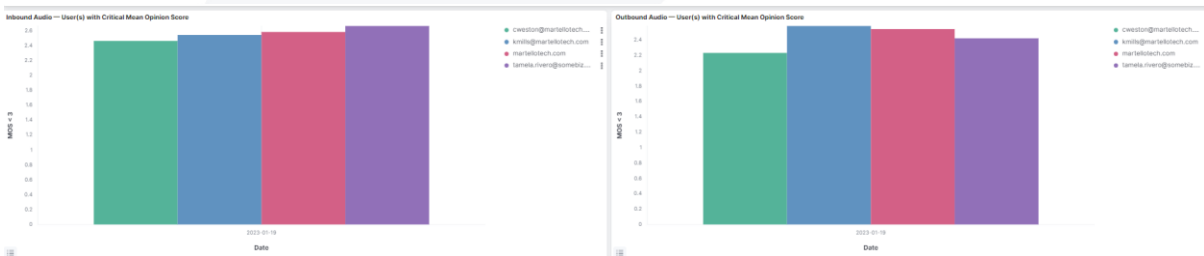
Export

Call ID	Date	Start Time	End Time	Call Type	Status	Reason(s)	Meeting Room	Affected Users	Total Users	Internal Users	External U...
30383336-3739-3433-3932-303030303032	2023-01-19	15:22	15:26	Conference	Poor	Round Trip Time (100 %), Packet Loss (67 %), Vide...	-	3	3	2	1

The goal here is to immediately pinpoint the root cause of the problem. In this instance round trip and packet loss, which means a poor end-to-end network performance, seems to have affected all users.

The other important information in this table is to identify if it was an internal or external call. You can see if this the case by looking at the last column.

Now we want to understand how poor the call was.



Vantage DX provides performance data for every stream that had an issue during the call. It means if you see color in that chart, it means that at least one participant had issue, either with the inbound or the outbound stream.

Below this chart you can find the details of every bad stream involved in that particular call, whether it is inbound or outbound audio, or inbound and outbound video and screen sharing stream.

Again, you will only see data for the streams that were problematic.

In this example, every stream was problematic.

You can scroll through the data to the right to see the most important parameter of the call.


The goal here is to understand how bad the call was.

A general MOS provides an idea of the average quality, but it is also important to check the min MOS as it tells you exactly when during a call the quality was very poor.

Inbound Audio — Stream(s) Details

Export

User	Date	Start Time	End Time	Min MOS	Avg MOS	Location	IP	Ct
kmills@martellotech.com	2023-02-08	15:26	15:30	2.14	2.37	Ottawa, Ontario, ...	161.100.2.34	Wi
adarnell@martellotech.com	2023-02-08	15:26	15:30	2.21	2.43	Ottawa, Ontario, ...	161.122.102.90	Wi
martellotech.com	2023-02-08	15:26	15:30	2.42	2.64	-	122.233.101.78	Wi
mbryant@martellotech.com	2023-02-08	15:26	15:30	2.82	3.06	Toronto, Ontario, ...	161.74.235.23	Wi



Poor quality is clearly the case here as you can see above. Any MOS under 4 is poor and anything under 3 is bad.

What is also interesting is to know that the external user also had a bad quality network as you can see in the last line of the table.

With this table you can easily identify if the problem during that call is yours or the one of the external users. If only the external user's streams were impacted, you know that this does not fall under your responsibility.

Scrolling to the right we see that call was PSTN and the ISP used was Bell Canada for our internal users. We also see that the audio devices were not optimal as everybody was using their laptop speaker.

Below you have the same level of information for the video and screen sharing streams:

Inbound Video and Screen Sharing — Problematic Stream(s) Details

Export

User	Date	Start Time	End Time	Stream	Poor Reason	Threshold	Value
kmills@martellotech.com	2023-01-19	15:22	15:26	Video	Video Frame Rate	<7	6.063
cweston@martellotech.com	2023-01-19	15:22	15:26	Video	Video Frame Rate	<7	5.917

We see here that the video was poor because the video frame rate was under 7 for 2 users. When it is under 7 frames per second, the quality perceived is bad.

Under these tables you can see an empty chart which is normal. These charts display the performance of the data going through AudioCodes SBC.

To activate it we need to choose a defined time period in the top right time menu. You can learn more in our video Monitoring the Performance of your SBC for Direct Routing Calls with Martello Vantage DX: <https://youtu.be/uqeKy-v8rws>

Now let's go a bit deeper.

This call was bad, we know that the Martello participants were in the Ottawa office and we know they were using the ISP Bell Canada.

If we come back to the Kate Mills user dashboard (just click the back arrow on your browser), we can see that she has a lot of issues with this particular service provider.



Scrolling down below the poor calls table you can also see the results of the network performance test that runs between this user and Microsoft Teams.

Recent Failed Vantage DX Diagnostics Tests — Displays up to 50 Tests

Export

Service	Date	End Time	Reason(s)	Failure Found at	Failure Found at IP	Site Name	Location
Microsoft Teams	2023-01-20	12:00	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA
Microsoft Teams	2023-01-20	11:45	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA
Microsoft Teams	2023-01-20	11:30	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA
Microsoft Teams	2023-01-20	11:15	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA
Microsoft Teams	2023-01-20	11:00	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA
Microsoft Teams	2023-01-20	10:45	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA

This feature is called Vantage DX Diagnostic. It works with a window service running on the user you want to troubleshoot to understand the path and the quality of its connection to Microsoft Teams.

If you would like more information about this feature watch the video: Proactively Support and Troubleshoot Microsoft Teams VIP Issues with Martello Vantage DX:

<https://youtu.be/T60KR5q9hUU>

As you can see, the test shows that both packet loss and round trip are impacted when the traffic is going through Bell. This establishes that the Bell ISP is responsible for the issues that Kate Mills is experiencing in this case.

Now to see if more people in that office are experiencing the same issue, we can switch to the location dashboard and check the quality of service in Ottawa.

Click on the burger menu, then Analyze then Location Dashboard.

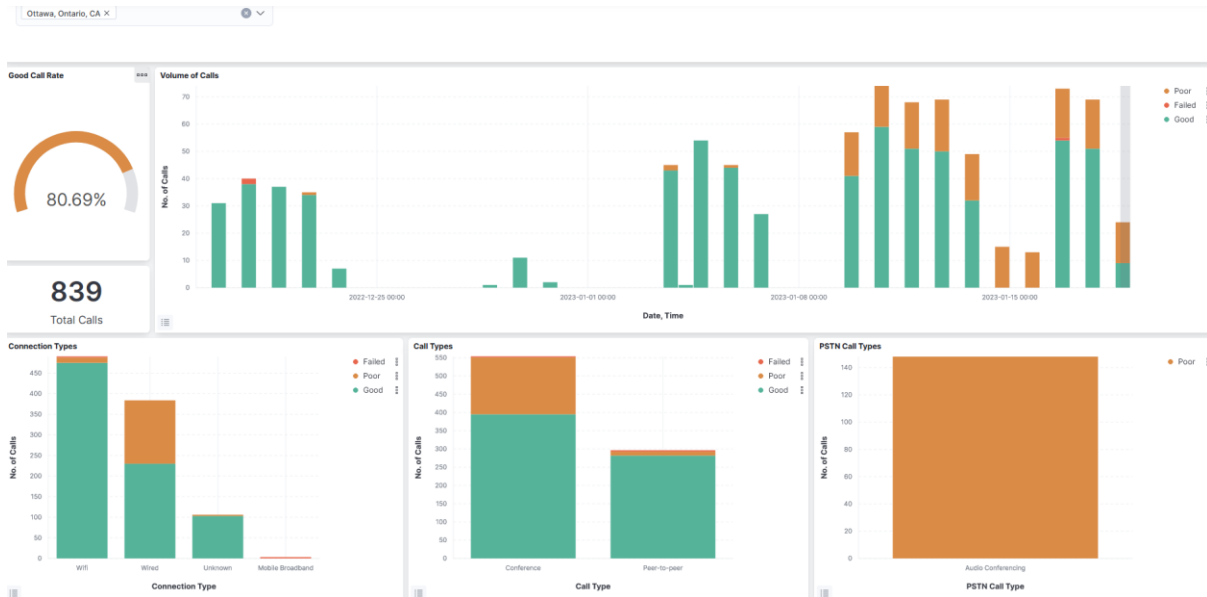
You are now in the location dashboard.

Select the location by clicking on the drop box

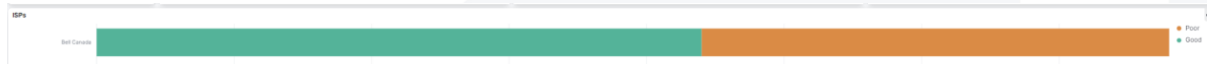
Filter by Location:
Select...

and then enter Ottawa.

We won't detail every aspect of this board as you are here to check if this entire office is experiencing the same issue as Kate Mills.



Here you can determine the overall service quality delivered to that location, the usage of Teams calls and meetings over time, how people are connected, the type of calls they perform and, in the screen, shot below, the ISPs that are involved.



In seconds, we can determine that yes, many users have issues in Ottawa, and they mostly involved Bell.

If we scroll down, you can see the result of the Vantage DX Diagnostic probe that sits in the Ottawa location to continuously measure the network path and quality between Ottawa and Microsoft Teams.

Recent Failed Vantage DX Diagnostics Tests — Displays up to 50 Tests

Export

Service	Date	End Time	Reason(s)	Failure Found at	Failure Found at IP	Site Name	Location
Microsoft Teams	2023-01-20	12:00	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	kmills@martellotech.com	Ottawa, Ontario, CA
Microsoft Teams	2023-01-20	12:00	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132	Ottawa Office	Ottawa, Ontario, CA

Recent Failed Vantage DX Diagnostics Tests — Displays up to 50 Tests

Export

Service	Site Name	Location	No. of Failures	Latest Failure	Top Reason	Failure Found at	Failure Found at IP
Microsoft Teams	Kanata Office	Ottawa, Ontario, CA	48	Feb 8, 2023 @ 15:36:48.000	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132
Microsoft Teams	Maddie.Grant@martellotec...	Ottawa, Ontario, CA	48	Feb 8, 2023 @ 15:36:48.000	Packet Loss, Round Trip Time	Bell Backbone	64.230.99.132

As for the one installed on Kate Mills, the test from the office clearly shows that network issues are found when the data goes through the Bell ISP.

We won't go through the rest of the dashboard, but you can go through it further in this video: [Detect, Prioritize and Analyze Teams User Experience Issues with Martello Vantage DX: https://youtu.be/b0LHnnb8UHs](https://youtu.be/b0LHnnb8UHs)

So, what have we found in this part?

Firstly, for this call our users had issues but so did the external users. So, it is a shared responsibility.

We understand how poor the call and the video were, who were on the call and the type of audio device they were using.

You also saw that this was not the only bad call for our users and that the network quality for our users sitting in Ottawa was poor. With the results of our network path monitoring feature, we conclude that this problem is caused by the ISP, and we know that need to contact them to fix the issue.

Now let's say that you want to have even more details on a call or that you want to be specifically alerted when specific call conditions are happening in order to troubleshoot them immediately.

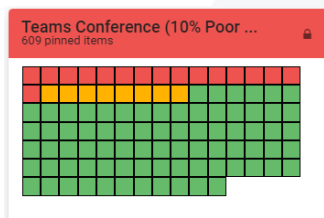
For that we are going to our Alerting Board.

Click the burger menu then 'Board'.

We are now in our Alerting configuration board where you can see many examples of the type of alerts you can have. We won't describe them here as that topic as already been detailed in this video: [Proactively Support Users With Microsoft Teams User Experience Alerting using Martello Vantage DX](https://youtu.be/ILsxQjRpzko): <https://youtu.be/ILsxQjRpzko>

We will focus here on the data you can find for every poor or failed calls and meeting.

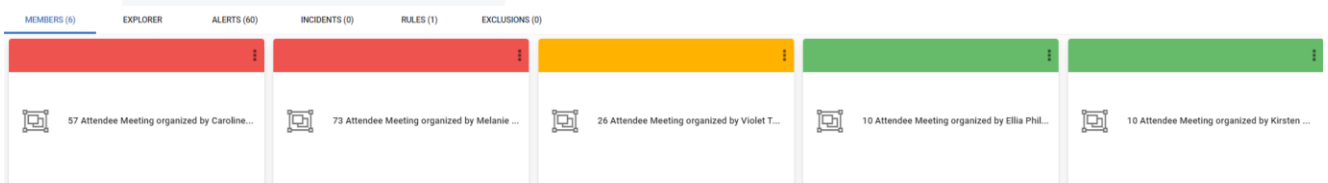
Let's focus on the Teams conference alert configuration. If you don't see the board, click on the blue arrow to the left to open the left side panel, from there, increase the displayed boards to 100.



This configuration alerts if more than 10% of the conference calls taking place in the past 4 days have been in a warning or critical state. All the thresholds are customizable.

If we click on it, we can see the details of the conferences with problems.

Let's open the biggest meeting we can find. In our case the last on the right with 57 attendees.



If you don't find this one, just scroll down to check the biggest meeting you can find. Please avoid any meetings with 4 attendees that are usually created by our robots for test purpose and as such do not return as much data as real ones.

PROPERTIES

We are now in the meeting properties:

Here you have a summary of the meetings with the 'poor' reason directly shown, in this case a bad Video Frame Rate.

Raw Properties

id	2eb02bb-59ea-42a5-880a-09f540ce3f20:Alina Davis
Name	36 Attendee Meeting organized by Alina Davis on 1/16/2023 1:29:33 PM
Meeting Start Time	2023-01-16T13:29:33Z
Meeting End Time	2023-01-16T14:33:03Z
Time Zone	UTC
Number Of Attendees	36
Number Of Attendees With Poor Calls	2
Poor Call Attendees	<ul style="list-style-type: none">• User Display Name: Alina Davis• User Device Name: Alina Davis Linux• User Device Id: Alina.Davis@martellotech.com-Linux-• Meeting Join Time: 2023-01-16T13:29:33Z• Meeting Leave Time: 2023-01-16T14:33:03Z• Poor Call Details: VideoFrameRateAvg• Time Zone: UTC• Is Organizer: true• User Display Name: Henry Crawford• User Device Name: Henry Crawford Windows Evenos Provence-Alpes-Cote d'Azur FR Wfi Orange S.A.• User Device Id: Henry.Crawford@martellotech.com-Windows-90-OrangeS.A.-Evenos-France• Meeting Join Time: 2023-01-16T14:34:01• Meeting Leave Time: 2023-01-16T14:34:10• Poor Call Details: VideoFrameRateAvg• Time Zone: Romance Standard Time

Now we can see each individual alert that this meeting has generated by clicking on the alert

tab: [ALERTS \(21\)](#)

There are 21 alerts related to the members of that meeting. If you click on any of them, you will have the complete data for every problem.

Id	79ee826d344d5f5b55b786f57f65b14342314ce1a3ddf6c79a424c5b7f114	End Time	2023-01-19T15:06:56
Meeting Id	19 893ce7b8cc1c4af59e42843e7a36488@thread.tacv2	Time Zone	Romance Standard Time
Conference Id	c60f9b6-4d3e-48ba-86b1-1a3555560bf9	User Agent	CallSignalingAgent (27/11.5.00.33362//release./releases/CL2022.R44.2022.44.01.1/releases/CL2022.R44)
User Name	Maddie Reed@marteilotech.com	Audioand Video Call	1
Client User Object Id	85d9275e-36d0-4c31-9048-a41049e1a991	Video Device	Integrated Webcam
End Point User Name	marteilotech.com	Video Codec	H264
User Device Id	Maddie Reed@marteilotech.com-Windows-212-JaguarNetworkSAS-Tremblay-en-France-France	Audio Device	CORSAIR VOID ELITE Wireless Gaming Headset
User Display Name	Maddie Reed	Audio Codec	SATIN
Client OS	Windows 10	Client Form Factor	Wireless Dongle - Headset
ClientOS Detail	Windows 10.0.19045.2485 Arch: x64	ClientIP Address	212.114.17.60
Client CPU U	Intel(R) Core(TM) i9-9980HK CPU @ 2.40GHz Number of Cores 8	Client City	Tremblay-en-France
Client Type	Client	Client Region	Ile-de-France
End Point User Display Name	marteilotech.com	Client Country	France
End Point Type	Server	Client Iap	Jaguar Network SAS
Session Type	Conf	End PointIP Address	52.113.218.6
Teams Client	Microsoft Teams Windows	End Point City	San Jose
End Point Client	MC Multipoint	End Point Region	California
End Point Connection Type	Wired	End Point Country	United States
Client Wifi Signal Strength	70	End Point Iap	Microsoft Corporation
Client Wifi Band	5.0 Ghz	Call Classification	Success
Client Wifi Radio Type	802.11ac	Poor Reason	VideoFrameRateAvg
Client Wifi Vendor Driver	Killer(R) Wi-Fi 6 AX1550x 160MHz Wireless Network Adapter (200NOW)	Concealed Samples Ratio	0.01
Client Bandwidth Est	30.5	Forward Jitter	2
End Point Bandwidth Est	83.6	Forward RTT	161
Client Transport	UDP	Reverse Jitter	2
Meeting Name	4 Attendee Meeting organized by Eric Hunt on 1/19/2023 9:59:36 AM	Reverse RTT	180
Meeting Organizer	Eric Hunt	Reverse Packet Loss	0.01
Start Time UT C	2023-01-19T14:59:50Z	Reverse Video Frame Rate	15.01
End Time UT C	2023-01-19T15:06:56Z	Reverse Video Frame Rate	2.33
Start Time	2023-01-19T15:59:50	Forward 50 Latency	179

ForwardP 50 Jitter	2
ReverseP 50 Packet Loss Rate	0.01
ReverseP 50 Latency	180
ReverseP 50 Jitter	2
Call Setup Failure Reason	NotMediaFailure
Media Failure Type	NotMediaFailure
Poor Call Explanation	<ul style="list-style-type: none"> Average frames per second received for a video stream, computed over the duration of the si This Client Wifi signal strength was less the 80% at 70%
Poor Call Reason Enums	<ul style="list-style-type: none"> 5 8
QoD Component Type	Call Alert


Now you can see every parameter of the call for this user and can understand how the user was connected, what device he was using, what was the network performance inbound and outbound, what was the quality of the video and at the end, the reason why this call was a problem for this user.

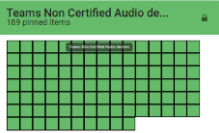
Clearly in this case, the Wi-Fi strength of the user was too low to allow a good connection which decreases the video frame rate to a point that was not acceptable for a good user experience.

Every one of these parameters can be used to define a search that will show you all the bad calls with that parameter. For example, the location, the client, the audio device, the round-trip time performance, etc.

It can also be used to create an alert configuration that will notify you every time a call meet the condition that you are looking for.


For example, if you want to find and be alerted on all the bad calls happening with non-certified devices.

Let's click twice on the back button  to come back to our alert configuration board.



You can find the alert configuration for this that we have setup as an example.

If you click on it, you will find the list of users that had issues with calls who were not using Teams certified devices. The board and the users are green because the alerts are not active anymore.

If you click on the Incidents tab  you will see that a ticket for this condition has been generated directly to ServiceNow.

With Vantage DX you can automate the ticketing of any issue related to Microsoft 365 and Microsoft Teams, also defining the conditions for the ticket to be opened and then closed.

Conclusion

We have seen how with Vantage DX you can track the quality of the calls from multiple perspectives. You can also check the calls through our dashboard and understand who is responsible for the call issues. You can then put that call into the context of the user or of its location to better understand the issue and dig into the final root cause.

You can also find every detail and parameter of every alert that was raised because of poor call quality through our alerting dashboard and easily setup alerts that you can synchronize with your ITSM based on any of these parameters.

With Vantage DX you can easily decrease your mean time to repair and quickly find the right data to troubleshoot the calls with issues and better support your users.