

CISCO *Live!*



#CiscoLive



The bridge to possible

ThousandEyes for Visibility into Cloud Collaboration

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BRKCOL-2889



#CiscoLive

Cisco Webex App

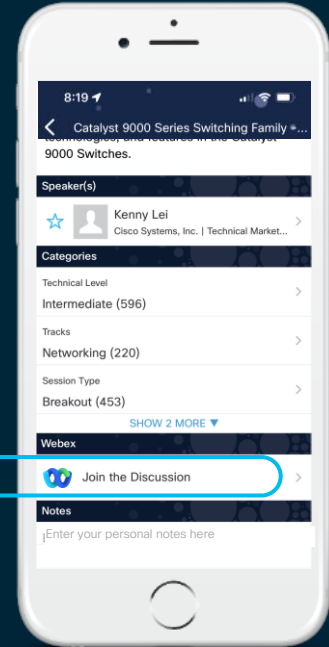
Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until June 17, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCOL-2889>



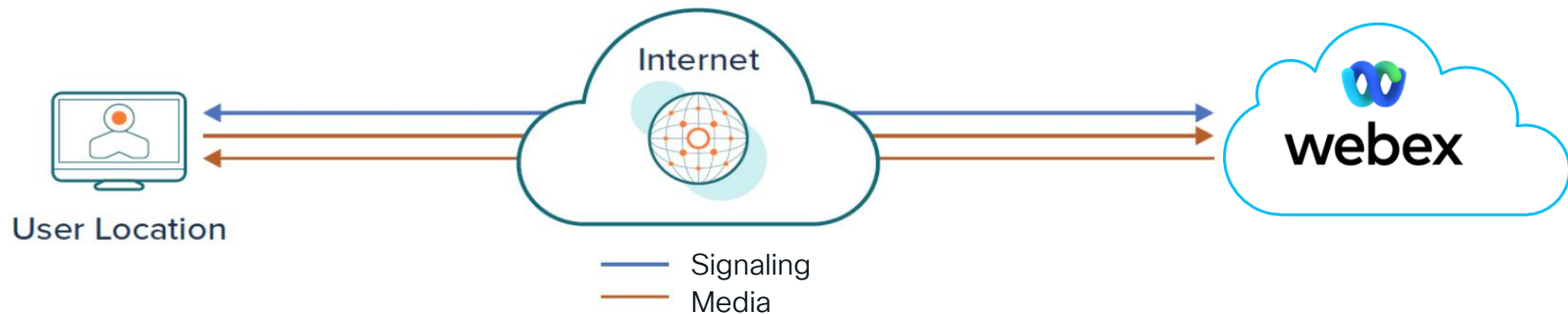
Agenda

- Why ThousandEyes and Webex
- ThousandEyes Technical Overview
- Types of tests
 - Agents to Webex Cloud Agent
 - Endpoint Agent Automatic Session to Webex
- Case Studies
- Key Takeaways
- Appendix – Control Hub Troubleshooting, other ThousandEyes use cases, etc

Why ThousandEyes and Webex



Why ThousandEyes and Webex?



- **Real-time media streams** like audio and video are very sensitive to network conditions
- ThousandEyes provide IT teams **network visibility** between user locations and Webex services
- Rapidly **identify problem domains** (application, network, or third-party)
- Leverage insights from ThousandEyes and Webex Control Hub to optimize performance and ensure exceptional Webex user experiences

Why ThousandEyes and Webex?



Webex tools for performance and availability

Analytics in Control Hub

Troubleshooting in Control Hub

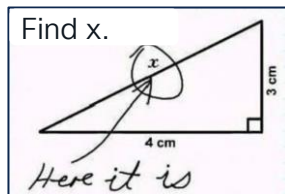
Reports in Control Hub

Webex App Health Checker

Webex Monitoring Service

<https://status.webex.com>

<https://mediatest.webex.com/#/main>



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ThousandEyes 

ThousandEyes facilitates

Visibility into the network path to Webex

Proactively simulate traffic

Easily share data with Service providers

Visualize forward and reverse network paths to isolate problem areas

Quick root cause analysis

$$3^2 + 4^2 = x^2$$
$$x = 5$$







ThousandEyes Technical Overview

Solution Components

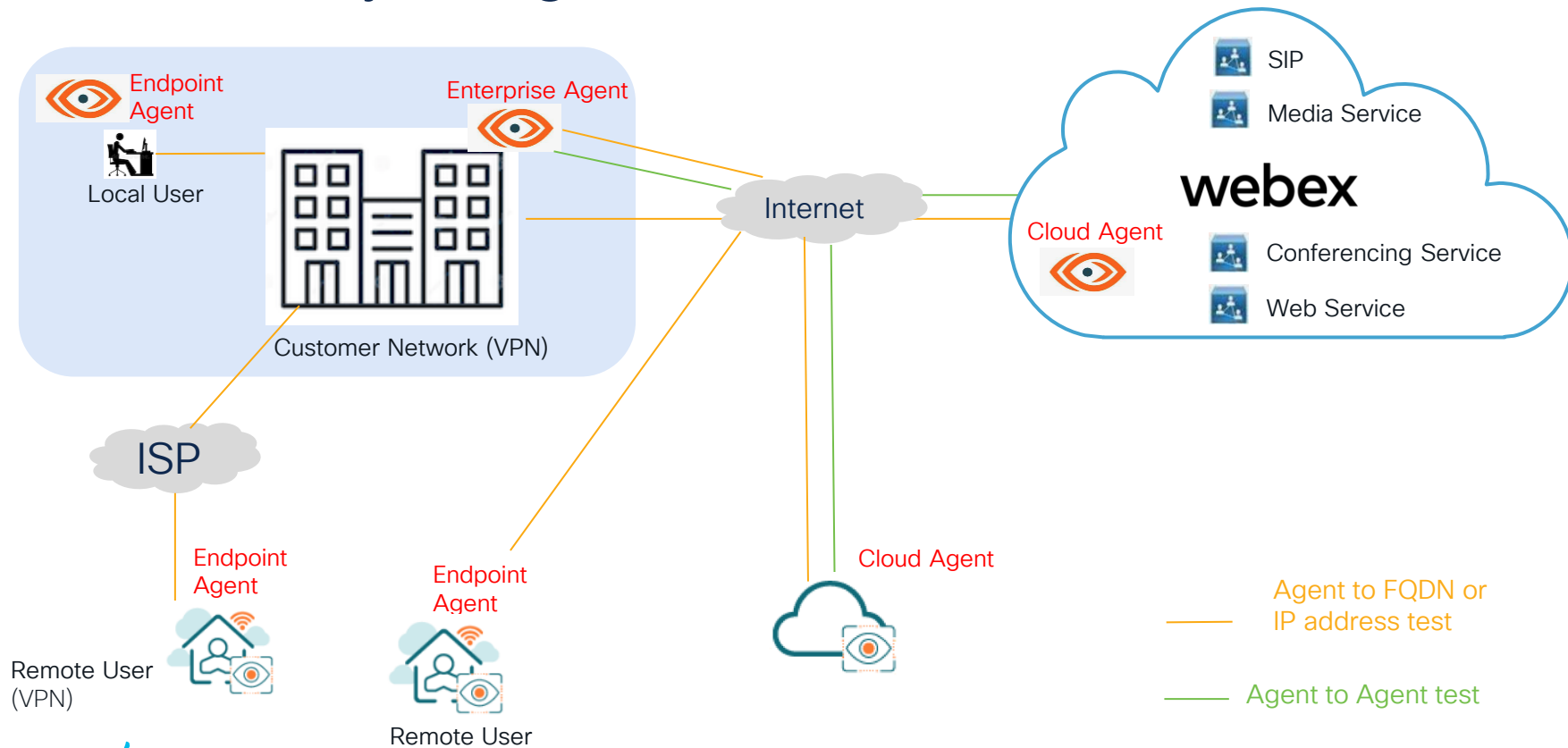


1 Agents	2 Tests	3 Data
Strategic Vantage Points	Layer 3-7 Tests available	Dashboards
Enterprise, Cloud, Endpoint	Lower Layers Nested	Reports
Outside-In, Inside-Out view	Run at schedule intervals	Shareable snapshots

High Level Agent Comparison

ENTERPRISE AGENT 	CLOUD AGENT 	ENDPOINT AGENT 
<ul style="list-style-type: none">▪ Inside-Out monitoring▪ Deployment Options<ul style="list-style-type: none">– OVA / Physical Appliance– Linux Package– Cisco ASR 1k/ISR4k/CAT8K– Cisco Nexus 9300 or 9500– Catalyst 9000▪ Clusters<ul style="list-style-type: none">– Increase Capacity– Disaster Recovery	<ul style="list-style-type: none">▪ Outside-In monitoring▪ 500+ Agents<ul style="list-style-type: none">– Tier 2 and 3 service providers– thousandeyes.com/map	<ul style="list-style-type: none">▪ Last-mile monitoring▪ End-user desktops and laptops as test devices▪ Deployment Options<ul style="list-style-type: none">– Operating Systems<ul style="list-style-type: none">▪ Windows 8.1 or higher▪ MacOS 10.10 or higher– Browsers<ul style="list-style-type: none">▪ Google Chrome 41+▪ Internet Explorer 11+▪ Microsoft Edge 79+

ThousandEyes Agents



Types of Tests

Enterprise/Cloud Agents to Webex Cloud Agent

Enterprise and Cloud Agent Tests

App Experience

- Transaction scripting, page load

HTTP/FTP/DNS/RTP/SIP

- HTTP Availability, response time, throughput

Network A2S or Agent to Agent

- Packet Loss, Latency, Jitter

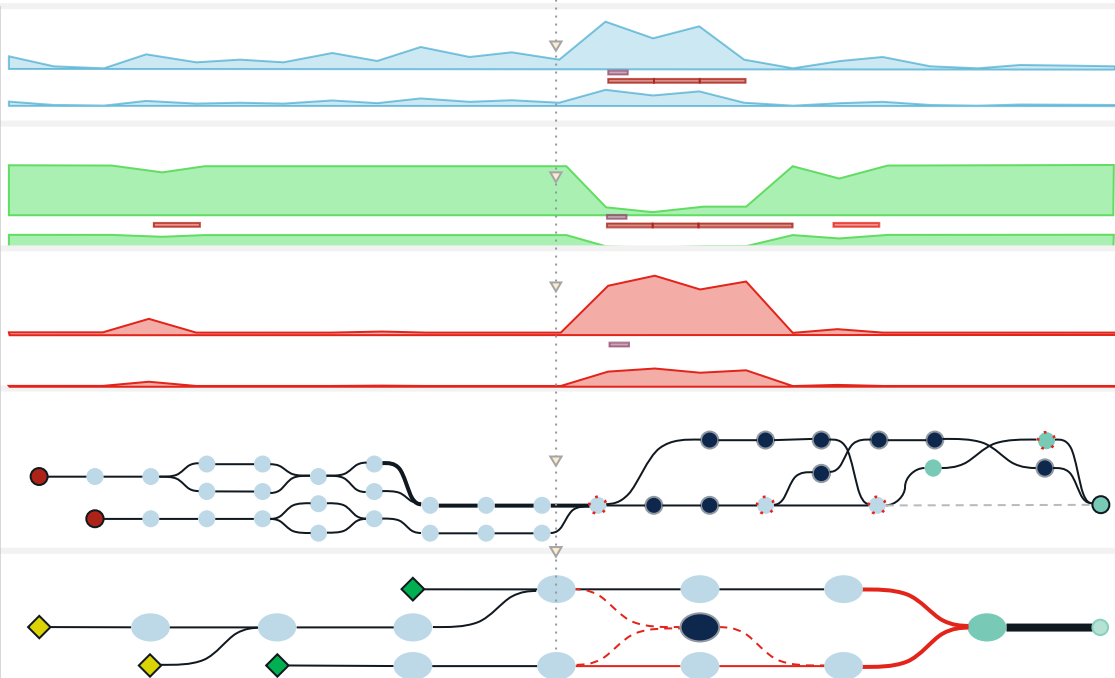
Path Visualization

- Hop-by-hop; multi-point; bidirectional
- Metrics and data per hop
- Integrated Outage Detection

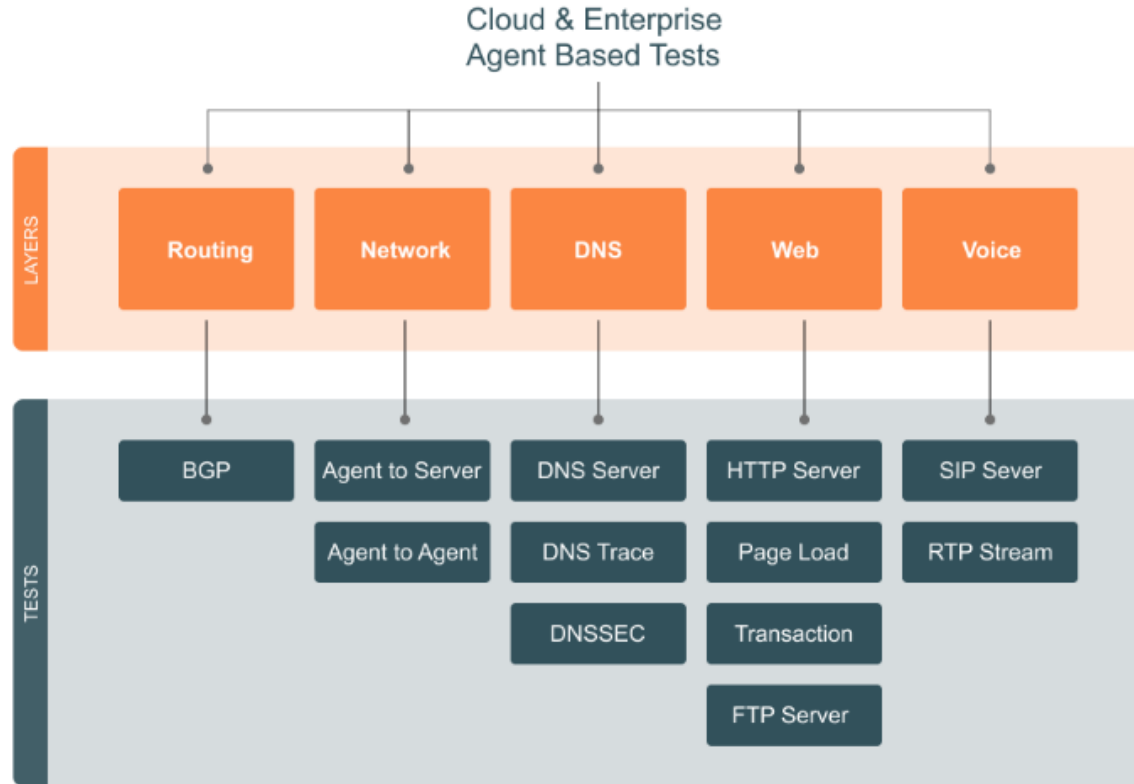
BGP Monitoring

- Reachability, path changes, updates

Time Correlated



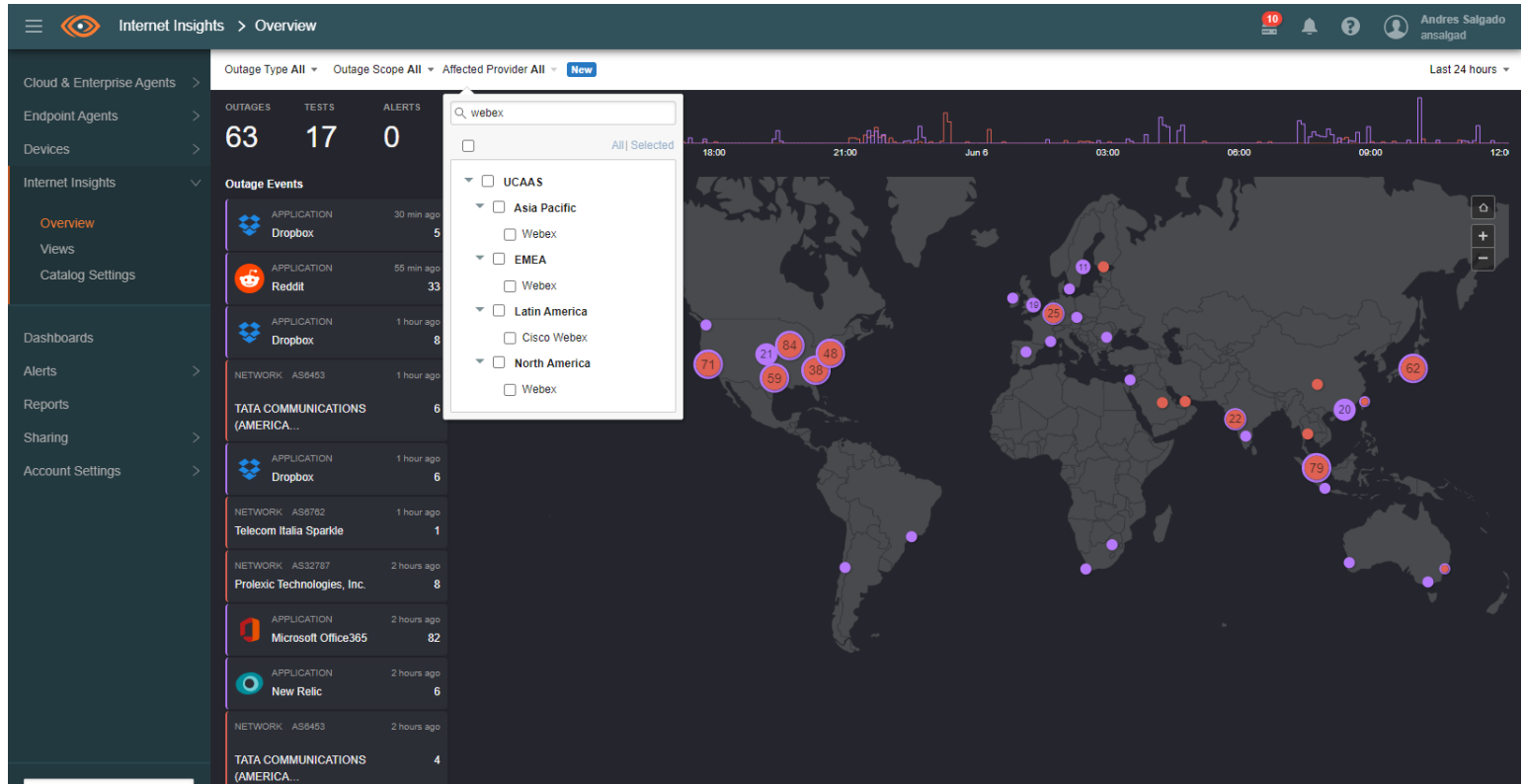
Cloud and Enterprise Agent-Based Tests



Test Best Practices for Monitoring Webex

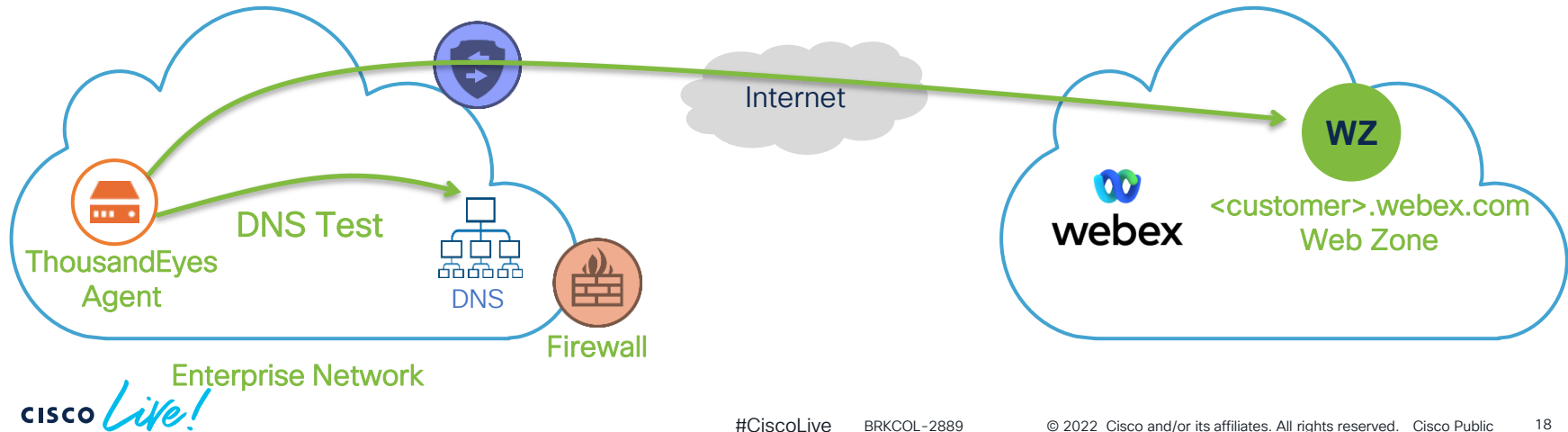
Target	Test Type	Description	Source Agent
Web Zone - https://<customer>.webex.com	HTTP	Front-end availability /performance	Enterprise, Cloud
Web Zone - https://<customer>.webex.com	Web Transaction	Front-end availability and login performance	Enterprise, Cloud
Web Zone domain availability - <customer>.webex.com	DNS	DNS availability/performance	Enterprise, Cloud
Closest Webex Cloud Agent	RTP Stream Test (Agent-to-Agent) (UDP) 9000 and 5004, DSCP 46	One-way inbound performance of simulated voice traffic into the Webex Cloud environment.	-Enterprise -Cloud
Closest Webex Cloud Agent	Agent-to-Agent (Bidirectional) UDP 9000 and 5004, DSCP 34	Simulated , bidirectional performance of video-marked traffic into Webex Cloud environment	-Enterprise -Cloud
Closest Webex Cloud Agent (Repeat the tests to the 2 nd closest Webex Cloud Agent, this should suffice as a backup test while limiting the number of tests created)	Agent-to-Agent (Bidirectional) UDP 9000 and 5004, DSCP 46	Simulated , bidirectional performance of audio-marked traffic into Webex Cloud environment	-Enterprise -Cloud

Internet Insights to Monitor Availability



Webex Web Zone Availability Testing

- A set of tests per every office location
- HTTP Server tests against <customer>.webex.com Web Zone
 - Automatic DNS fallback to secondary Web Zone
 - If clients use HTTP proxy (on-prem or Umbrella), so does the test
- DNS Server test against Enterprise DNS servers for the <customer>.webex.com domain
- Tests global domain reachability as well as performance of the enterprise DNS infrastructure



Finding Webex Media Node

- In Control Hub under troubleshooting, after finding a meeting click on the participant details. This will show the media node location:

Equipment and Networks	
Client:	Webex Meetings 42.4.3.10
Platform:	Windows 10.0.19041
Join From:	Chrome 100
Connection:	ethernet
Media Node:	Washington D.C., USA
Local IP:	192.168.1.208/28
Public IP:	75.42.46.232/30
Location:	Tucker, GA, US
Audio Transport:	UDP
Video Transport:	UDP

- In Control Hub under Reports, select Meeting Attendees report or create a Custom Template report that includes the Media Node field. This will show the media node location:

Create custom template

Build your own report template from the base templates. Add or remove columns, and apply filters.

Template

Base template * Meetings Attendees ▾

New name * ⓘ Media Nodes used by users

Description * ⓘ Template description and key metrics

Data

Filter data ⓘ Apply filters

Customize columns

Available columns (50)

Search

- VOIP_RECEIVING_AVERAGE_PACKET_LOSS
- VOIP_AVERAGE_LATENCY
- TCP_PERCENTAGE
- UDP_PERCENTAGE
- IS_CMRR

Display columns (5)

- MEETING_NUMBER
- MEETING_NAME
- CONFERENCE_ID
- USER_NAME
- MEDIA_NODE

Tests to Webex Cloud Agents

Cloud & Enterprise Agents > Test Settings

Views
Test Settings
Agent Settings
BGP Monitors

Endpoint Agents >
Devices >
Internet Insights >
Dashboards
Alerts >
Reports
Sharing >
Account Settings >

Tests Test Labels Credentials Repository

Add New Test

New Test

Layer Routing Network DNS Web Voice

Test Type Agent to Server Agent to Agent

Test Name Optional

Test Description Optional

Views Enabled for This Test

Network Overview
Routing Path Visualization
BGP Route Visualization

Basic Configuration Advanced Settings

Target Agent No agent selected...

Interval Q. webex

Show All | Enabled

Agents

Direction Singapore (Webex) Tokyo, Japan (Webex)

Protocol

Path Trace Mode Amsterdam, Netherlands (Webex) Frankfurt, Germany (Webex) London, England (Webex)

Alerts

North America

Built-in Labels

Cloud
Enterprise
IPv4 Compatible
IPv6 Compatible
Single Homed
Webex Cloud

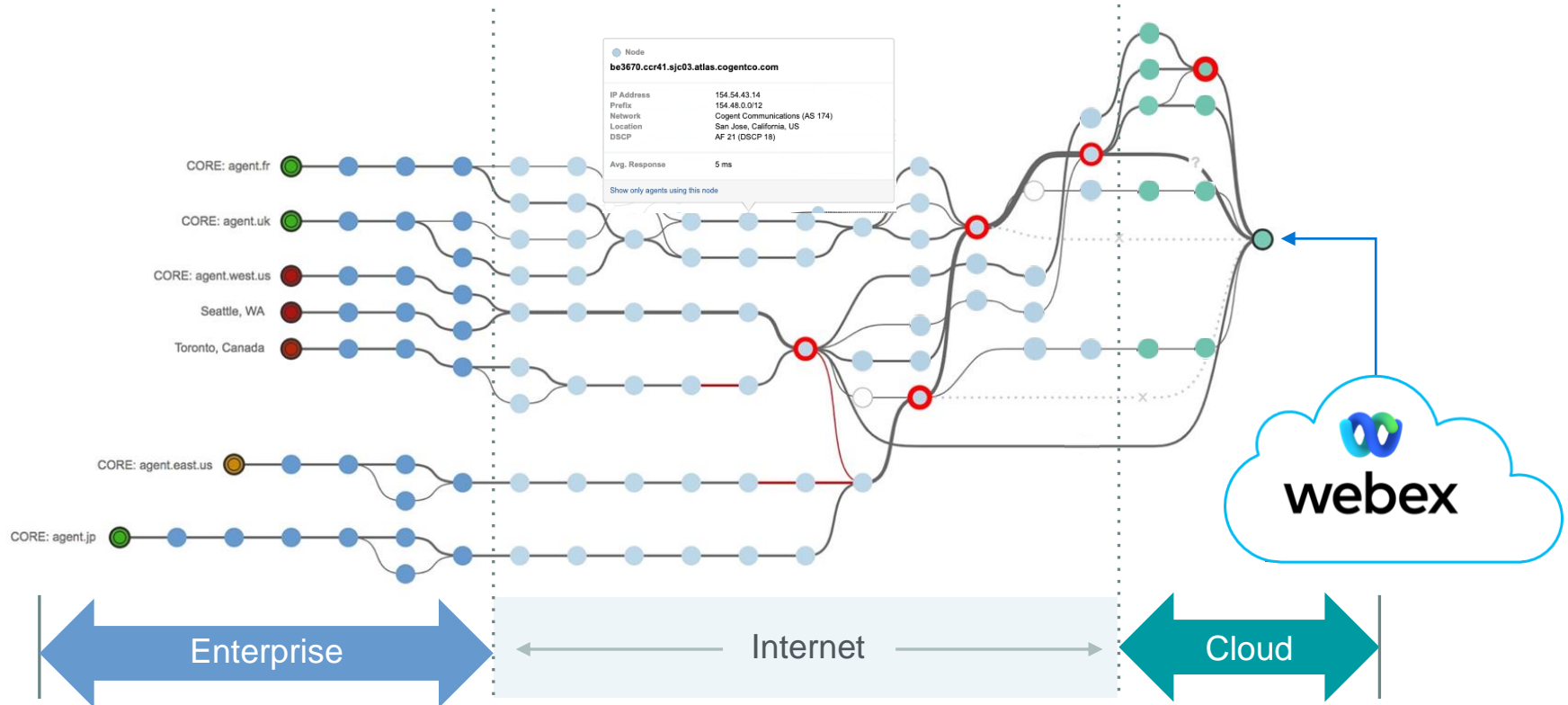
The different layers captured, in this case only the network layer and routing layer

Required for bidirectional path visualization








Filter target agent by Webex Cloud Agents

Correlated Visibility Into ALL Networks


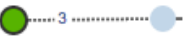



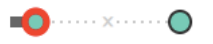
Availability and Performance



Path Visualization components

Object Image	What it signifies	Comments
	Agent location	The agent changes color based on the metric selected. The color scale goes from dark green (no loss, latency, jitter, etc.) to red (severe loss, latency, jitter, etc.)
	Enterprise Agent	The color of a Enterprise Agent is double-ringed, and changes color according to the same scale as a ThousandEyes Cloud Agent.
	Identifiable node	A blue node indicates that IP information is available.
	Unidentifiable node	A white node indicates that IP information is not available.
	Node in local network	A dark blue node indicates that a node was identified inside the agent's source network.
	Node in destination network	A node shaded in green indicates a node that was identified as inside the destination network, as specified by the Autonomous System of the customer.
	Node with loss	A node circled in red indicates that loss is occurring at that point in the path, meeting the percentage threshold specified by the loss slider.

Path Visualization components

Object Image	What it signifies	Comments
	Selected link	A link represented as a moving blue dashed line indicates that the link is selected.
	Collapsed path	A path showing a dotted line indicates a path that was simplified for visualization purposes. Expand using the complexity slider, or by clicking the label indicating the number of hops that were collapsed.
	Split path	A path showing a split is an indication that there are multiple routes to the destination. All path visualization is based on a minimum of three tests running from each agent. When a path splits, the thickness of the line representing the link between the nodes shows how many of the tests traversed each link.
	Link with high delay	A red link indicates a delay that meets the threshold specified by the latency slider.
	Unknown number of hops between nodes	A dotted link with a question mark indicates insufficient data to determine the number of hops separating these nodes. Typically, indicative of differing numbers of unresponsive nodes between responsive nodes, or an indication of path trace being unable to reach the destination when the end-to-end measurement was performed successfully.
	Unable to reach target node	A dotted link with an X symbol indicates a trace that was unable to be completed to the target due to 100% forwarding and 100% end-to-end loss.

Endpoint Agent Automatic Session Test to Webex

Endpoint Agent Automatic Session Test to Webex

- Measure the availability and performance of the user SaaS and internet experience, with views of any packet loss or latency and local network health
- ThousandEyes dynamically initiate a test when joining a Webex meeting and determines the destination IP address to monitor
- No need to manually configure a test with an IP address or hostname to Webex

The screenshot shows the ThousandEyes management console. On the left, the 'Endpoint Agents' menu item is highlighted with a red arrow. The main content area shows 'Test Settings' with a sub-tab for 'Automated Session Tests'. Below this is a table with two tests: 'Webex' and 'Webex TCP'. To the right, the 'Add New Test' dialog is open, showing the 'Basic Configuration' tab. The 'Target' field is highlighted with a red box and contains the text 'Webex'. Other fields include 'Test Name' (Webex), 'Protocol' (Prefer TCP (ICMP fallback)), 'Probing Mode' (Prefer SACK), 'Path trace in session' (checked), 'Interval' (5 minutes), and 'Agents' (All agents).

Test Name	Application	Last Test
Webex	Webex	yesterday
Webex TCP	Webex	7 days

Install the Endpoint agent on a laptop with the problem

Reference

Endpoint Agent is supported on:

- Windows 8.1 or higher
- Windows Server 2012+ or higher.
- MacOS 10.10 (Yosemite), and higher

Agent Settings > Add New Endpoint Agent

The screenshot displays the Cisco Secure Endpoint Agent Settings interface. The left sidebar shows the navigation menu with 'Agent Settings' highlighted. The main content area shows the 'Add New Endpoint Agent' section. The 'Endpoint Agent' option is selected, indicating deployment within the organization. Below this, there are download links for Windows, Mac OS, and a section for 'Allow anyone with the link to download' with download and copy link buttons for each platform.

Endpoint Agents > Agent Settings

Endpoint Agents | Proxy Settings

Add a filter

Search by Name or Hostname

☐ Name

☐ YHUNG-M-G06E yhung

☐ Andres's Laptop CISCO\ansalgad

☐ DESKTOP-RBGT40G DESKTOP-RBGT40G\emily

☐ ANSALGAD-WT1 CISCO\ansalgad

Endpoint Agent (selected) | Endpoint Agent Pulse

Deploy within your organization to collect data | Deploy outside your organization (external partner or customers)

Windows | Windows 8 or later. Browser Session Data requires Google Chrome, Internet Explorer 11+ or MS Edge 79+ | Download - Windows MSI | Installation Guide

Mac OS | Mac OS X 10.9 (Mavericks) or later. Browser Session Data requires Google Chrome | Download - Mac ZIP | Installation Guide

☒ Allow anyone with the link to download | Generate new links

Endpoint Agent

Windows MSI X64: Download Copy Link

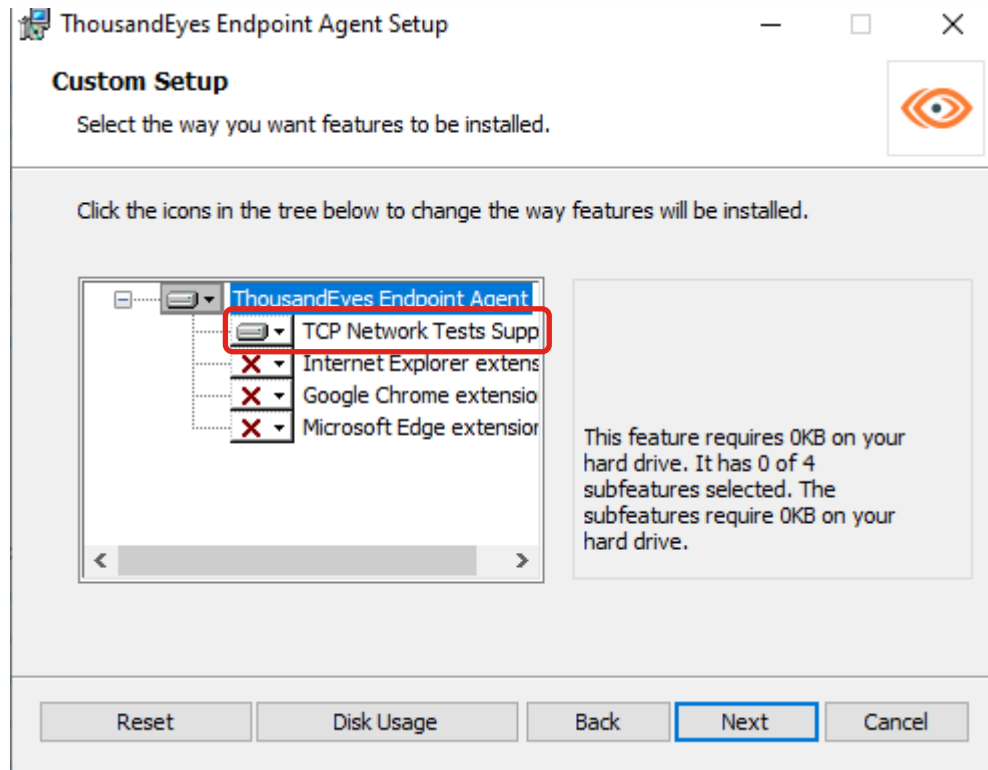
Windows MSI X86: Download Copy Link

Mac ZIP: Download Copy Link

Install the Endpoint agent on a laptop with the problem

Reference

- Endpoint Agent installer automatically adds the standard NPCAP installer for Windows
- NPCAP Driver version must be v 1.10.
- Reboot the system to have the NPCAP driver installed.



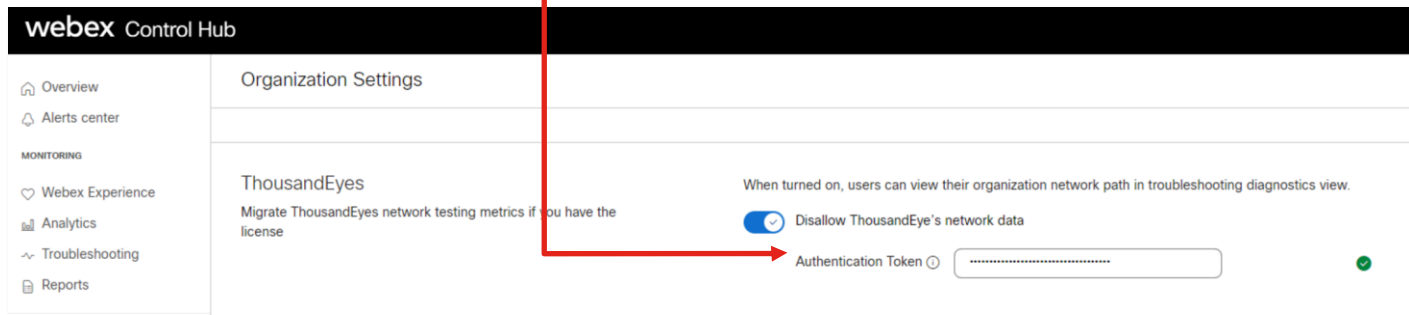
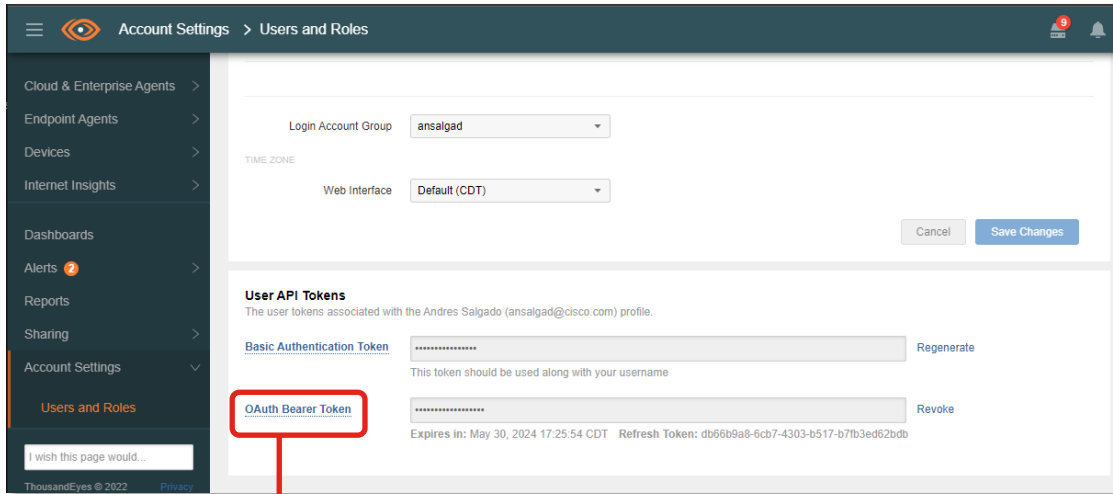
Activate ThousandEyes in Control Hub

Under Organization Settings>>ThousandEyes

The screenshot shows the Cisco Webex Control Hub interface. On the left is a navigation sidebar with sections: Overview, Alerts center, MONITORING (Webex Experience, Analytics, Troubleshooting, Reports), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES. The main content area is titled 'Organization Settings' and contains a 'ThousandEyes' section with the text 'Migrate ThousandEyes network testing metrics if you have the license'. A modal dialog box is open in the center with the title 'Activate ThousandEyes network path feature'. The dialog text asks: 'Do you want to update the organization ThousandEyes network path feature in troubleshooting diagnostics process? Please copy the tokens from [ThousandEyes User Profile](#) . To check feature details in [ThousandEyes Network Path](#)'. At the bottom of the dialog are 'Cancel' and 'Activate' buttons. In the background, partially visible, are input fields for 'hour(s)', 'token(s)', and 'minute(s)', and a toggle switch labeled 'Allow ThousandEye's network data' which is currently turned on.

Activate ThousandEyes in Control Hub

Under Organization Settings>>ThousandEyes



Control Hub Troubleshooting

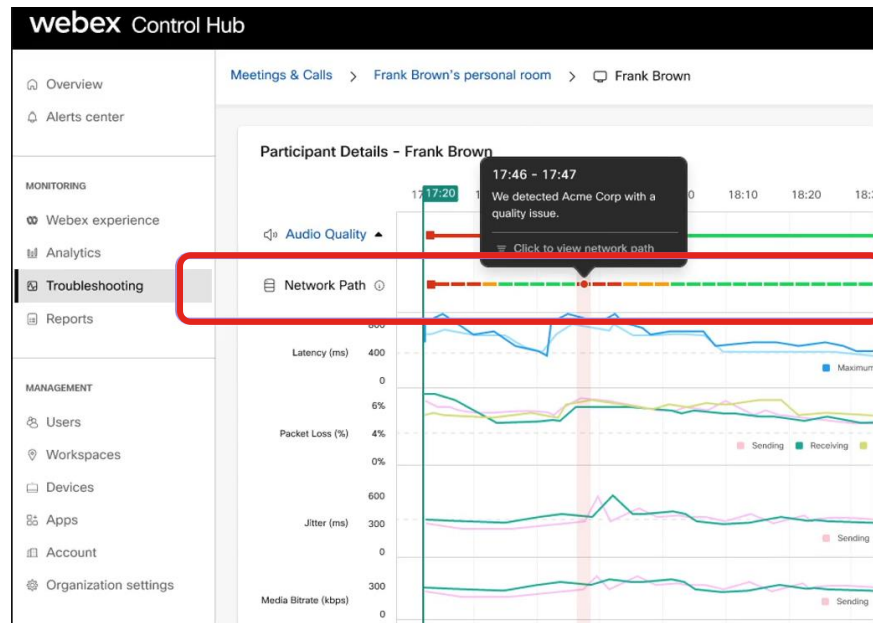
Integration with ThousandEyes

Feature

- Display participant **network path** details in Control Hub Troubleshooting, information provided by the ThousandEyes endpoint automated session testing for Webex.

Benefits

- Clear end to end network path, hop-by-hop details
- Easily connect to ThousandEyes dashboard for more insights

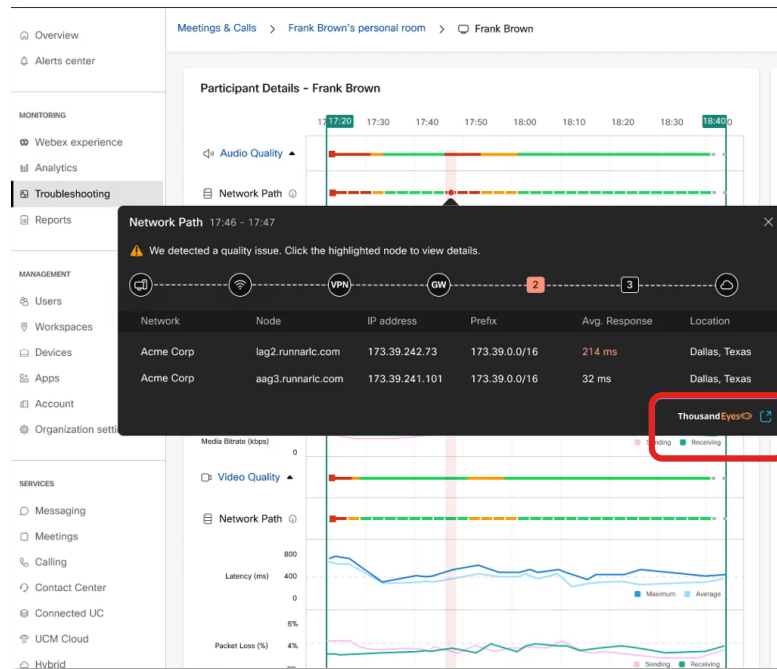


Control Hub Troubleshooting

Integration with ThousandEyes

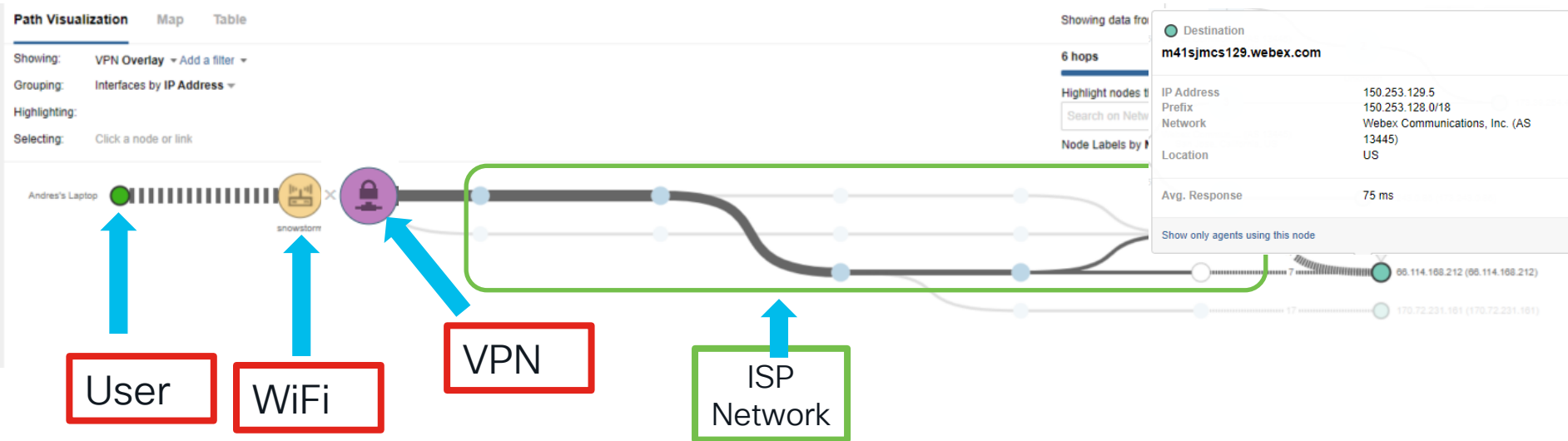
- Network path shows under Audio Quality
- Clear end to end network connectivity
- Hop-by-hop details
- Cross launch to ThousandEyes dashboard to further explore the issue

Control Hub Measurement	Threshold	Color
Latency	<300ms	Good
	300ms<400ms	Fair
	>400ms	Poor
Packet Loss	<3%	Good
	3%<5%	Fair
	>5%	Poor



ThousandEyes Endpoint Agent

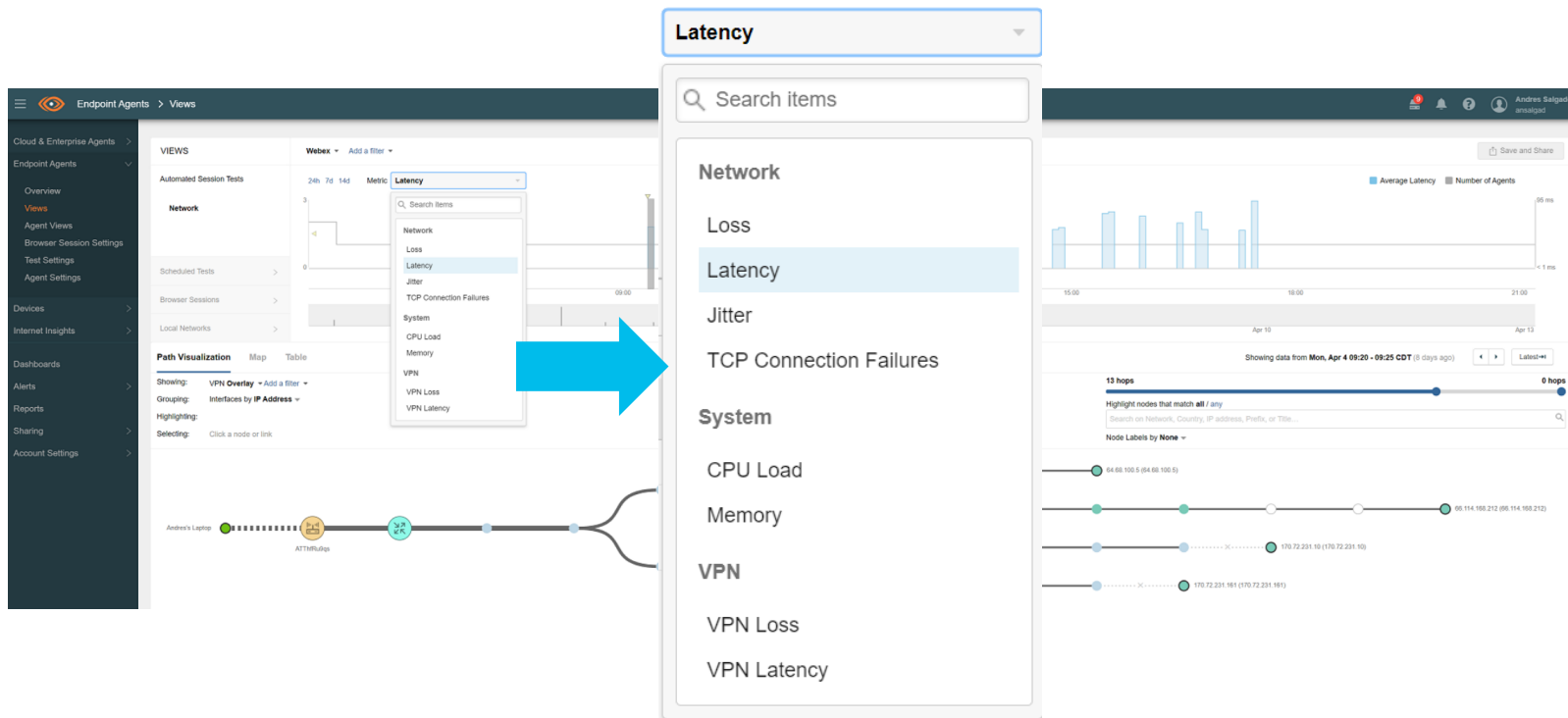
Remote Worker Visibility



Remote worker experience End-to-End visibility to Webex

ThousandEyes Endpoint Agent metrics that can be monitored

Reference



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- Filter by: source agent, target server, and test
- Filter by intermediary nodes by location, network,
- You can configure:
 - TCP or UDP
 - DSCP markings
 - Increase the traces per round from 3-10
 - Unidirectional or bidirectional



- Monitoring VPN performance.
- Filter by: Agent, Connection type (Wired vs. Wireless), Network, Location, Platform (Windows vs. Mac), VPN vendor, etc.
- Clearly distinguished Icon for access point, gateway and VPN
- No DSCP marking evaluation
- 3 trace per round behavior is not modifiable here.
- Unidirectional

Case Studies

Case Study 1

Enterprise Agent to Webex Agent

Case Study 1: Webex Board experiencing intermittent audio quality problems

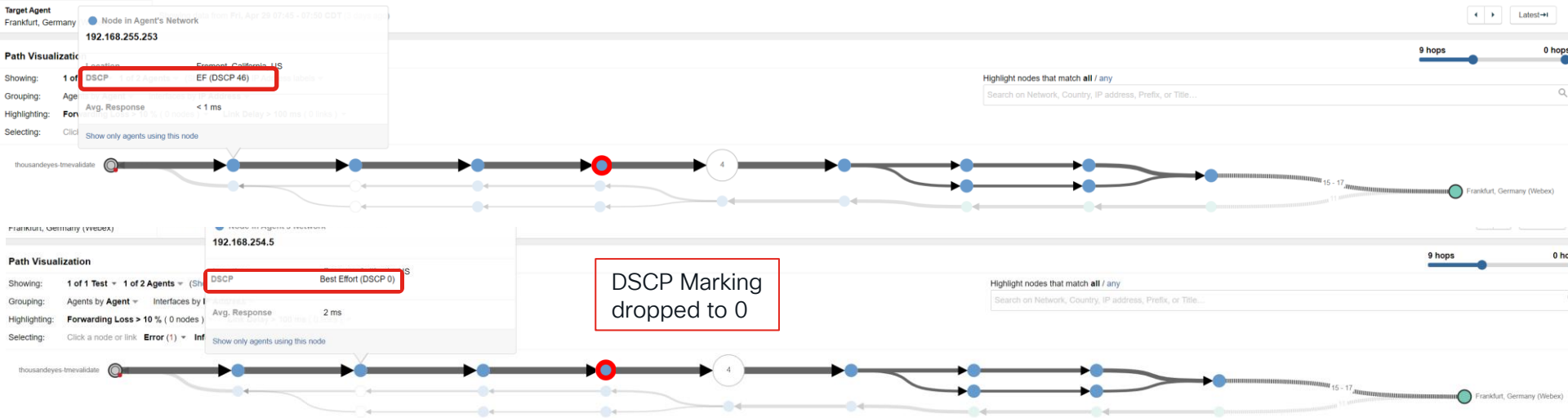
Steps to resolution

- Gather details to understand the problem better:
 - Username(s) and time of the problem
 - How did the user join the meeting?
 - Was this working before, were there any changes? Is this reproducible?
 - Meeting ID / Conference ID from the problematic meeting?
 - Who was experiencing quality problems, was it receiving or transmitting?
- From Control Hub
 - Check if the user with the problem uses UDP. If clients are connecting via TCP, it may not be the best media experience. Investigate why UDP 9000 or 5004 did not connect (e.g. Firewalls blocking UDP).
 - Check Media node for the participant
 - Check CPU utilization, Memory utilization
 - Check network connection type: WiFi or Ethernet
 - Check for Packet loss or Latency

Case Study 1: Webex Board experiencing intermittent audio quality problems

Steps to resolution

- Make sure that the enterprise agent is installed in the same network as the Webex device
- Proactively monitor the Webex destination network
- Check QOS markings are preserved in the enterprise network



Case Study 2

Endpoint agent

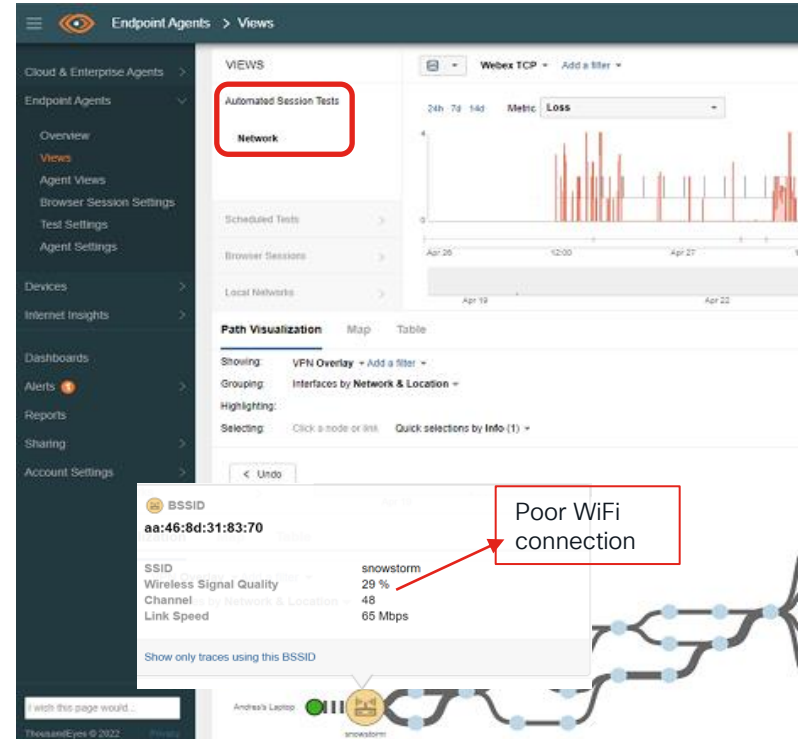
Case Study 2: Webex remote user experiences audio and video quality issues intermittently

Problem description

- Gather details to understand the problem better:
 - Username(s) and time of the problem
 - How did the user join the meeting?
 - Was this working before, were there any changes? Is this reproducible?
 - Meeting ID / Conference ID from the problematic meeting?
 - Who was experiencing quality problems, was it receiving or transmitting?
- From Control Hub
 - Check if the user with the problem uses UDP. If clients are connecting via TCP, it may not be the best media experience. Investigate why UDP 9000 or 5004 did not connect (e.g. Firewalls blocking UDP).
 - Check Media node for the participant
 - Check CPU utilization, Memory utilization
 - Check network connection type: WiFi or Ethernet
 - Check for Packet loss or Latency

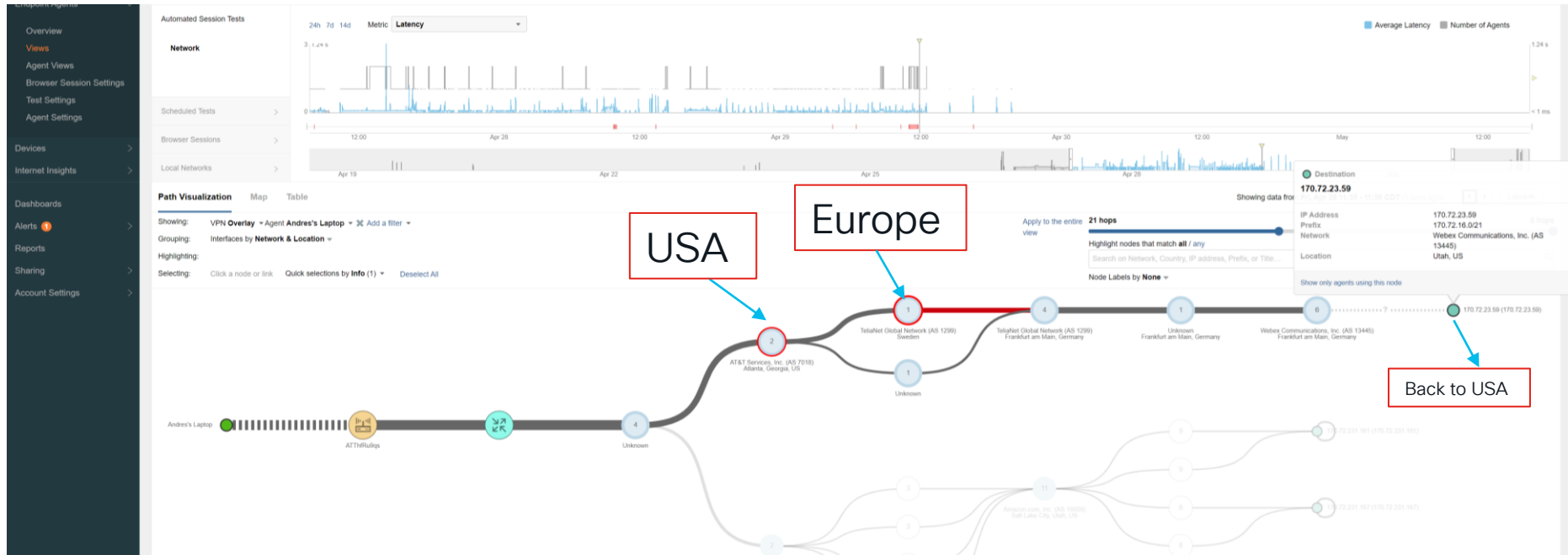
Case Study 2: Webex APAC remote user experiences audio and video quality issues intermittently

- Install the endpoint agent on the user PC with the problem if not already installed
- From ThousandEyes:
 - Check Wireless signaling quality
 - VPN location connection, filter by VPN loss and VPN latency
 - Network path visualization



Case Study 2: Webex remote user experiences audio and video quality issues intermittently

- Check if there is misrouting causing higher latency or packet loss. Create a sharable link to provide to the ISP

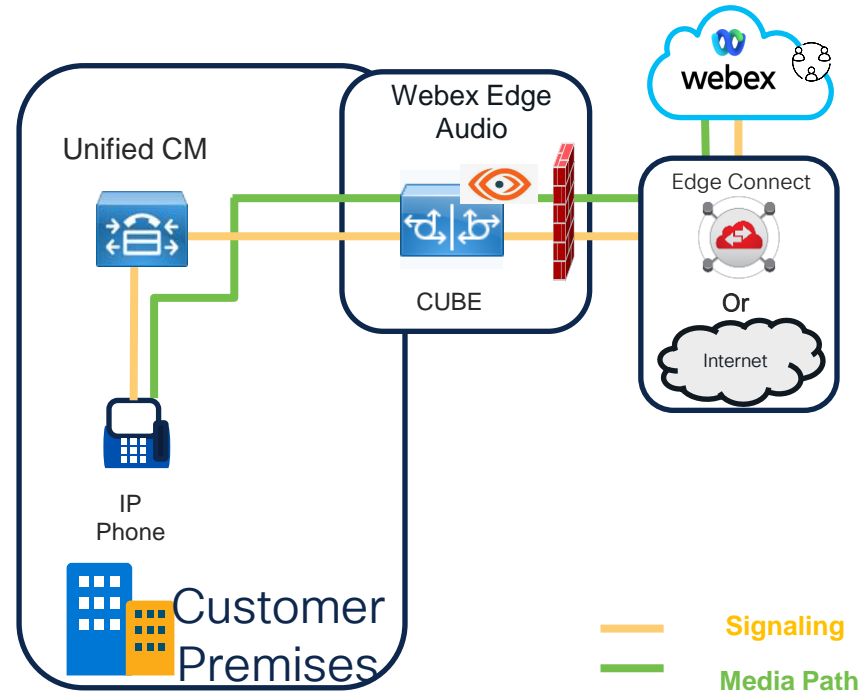


Case Study 3

Case Study 3

Problem description

- Users using Dial-in and Callback with Webex Edge Audio are experiencing audio quality problems.



Find the Webex Data Center used for Webex Edge Audio Callback

webex Control Hub

Audio Settings

Cisco Webex Meetings Sites > Configure ucdemolab.webex.com > Audio Settings

Secure Edge

Edge Audio Allowed Callback Numbers

Use this section to define which country dialing codes participants can choose from when entering a callback number to join meeting audio. Callback uses your Edge Audio configured callback route for the countries/regions that you enable.

Retry call using PSTN Audio ☐ Enable

Country/Region:

Call Routing:

Country/Region	Call Routing	Connectivity Check Status	Webex Location	Action
Extension	Webex Edge Audio (vcseclusterzone1.cisco.com)	Successful	Singapore	

Webex Edge Audio servers are not in the same location as Webex Meetings ThousandEyes Cloud Agents but it can still be useful to provide visibility to a Webex IP address connection

- Initiate a RTP test from ThousandEyes to Webex

The screenshot shows the 'Test Settings' page for 'Cloud & Enterprise Agents'. The left sidebar contains a navigation menu with 'Test Settings' highlighted. The main content area is divided into 'Basic Configuration' and 'Advanced Settings' tabs. The 'Basic Configuration' tab is active, showing fields for 'Test Name' (RTP test to Singapore Webex), 'Test Description' (Optional), 'Target Agent' (Singapore (Webex)), 'Interval' (5 minutes), 'Agents' (1 of 2 selected), and 'Alerts' (1 of 2 alert rules selected). The 'Advanced Settings' tab is also visible. On the right, there are two panels: 'General Information' and 'Views Enabled for This Test'. The 'General Information' panel shows 'Labels' (Add Labels), 'Sharing' (0 of 1 account group), and 'Created' (By Andres Salgado, 35 minutes ago). The 'Views Enabled for This Test' panel shows 'Voice' (RTP Stream), 'Network' (Path Visualization), and 'Routing' (BGP Route Visualization). At the bottom right, there are buttons for 'Cancel', 'Run Once', and 'Save Changes'.

Cloud & Enterprise Agents > Test Settings

Cloud & Enterprise Agents

Views

Test Settings

Agent Settings

BGP Monitors

Endpoint Agents

Devices

Internet Insights

Dashboards

Alerts 1

Reports

Basic Configuration Advanced Settings

Test Name RTP test to Singapore Webex

Test Description Optional

Target Agent Singapore (Webex)

Interval 5 minutes

Agents 1 of 2 selected

Alerts ☐ Enable

1 of 2 alert rules selected Edit Alert Rules

Cancel Run Once Save Changes

General Information

Labels Add Labels

Sharing 0 of 1 account group

Created By Andres Salgado 35 minutes ago

Views Enabled for This Test

Voice RTP Stream

Network Path Visualization

Routing BGP Route Visualization

ThousandEyes test for Edge Audio Dial-in

- Alternatively, we can point the network test to the media destination IP address.
- Find the Webex media IP address used
 - If **CUBE**, use debug ccsip message
 - If **Expressway**, Navigate to Maintenance > Diagnostics > Diagnostic logging

Example SIP response from Webex for dial-in

```
May 9 22:08:28.163: //2380901/8B61eE800000/SIP/Msg/ccsipDisplayMsg:
Received:
SIP/2.0 200 OK
Via: SIP/2.0/TLS 172.16.11.70:5061;branch=z9hG4bK9DE326EA
Record-Route: <sip:rtr$net_me_udp@207.182.174.102:5065;transport=tls;lr>
To: Cisco Webex <sip:41434569563@ciscox.amer.pub.webex.com>;tag=0-lf4d0782
From: <sip:50358@172.16.11.70>;tag=5554828F-21FD
Contact: <sip:41434569563@10.120.0.16:5060>
Remote-Party-ID: "Cisco Webex" <sip:41434569563@ciscox-sj.amer.prv.webex.com>;party=called;screen=no;privacy=off
Call-ID: 62B48E2A-CF1B11EC-940199AF-5806ECE8@172.16.11.70
CSeq: 101 INVITE
Content-Length: 321
Date: Mon, 09 May 2022 22:08:28 GMT
Timestamp: 1652134106
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, FRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER
Allow-Events: telephone-event
Supported: replaces
Supported: sdp-anat
Supported: timer
Server: Beech/42.4.1-617
Session-ID: 5d7c0080f74705a44520ec58ef6d855;remote=da4bf7206a6353bf85cc81c9a27933ae
Content-Type: application/sdp
Content-Disposition: session;handling=required
P-Asserted-Identity: "Cisco Webex" <sip:webex.com>

v=0
o=Beech 144883946 2086592534 IN IP4 10.120.0.16
s=SIP Call
t=0 0
m=audio 48176 RTP/SAVP 0 101
c=IN IP4 170.72.180.16
a=rtpmap:0 PCMU/8000
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
a=time:20
a=crypto:3 AES_CM_128_HMAC_SHA1_80 inline:xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

Key Takeaways

Key Takeaways

- ThousandEyes is an additional tool that can be used to **optimize the Webex user experience**
- Leverage Webex Cloud Agents to **proactively monitor** the network path from the enterprise to Webex
- Leverage Endpoint Agent automatic session testing to Webex is ideal for a faster resolution in troubleshooting remote workers network problems
- ThousandEyes data **can be share easily** with Service Providers, Network team, or any other stakeholder

Cisco Live Breakout sessions to check

- **BRKCOL-2431** - Diagnosing and Troubleshooting Meetings in Webex by Paul Giralt
- **LABCOL-1004** - Monitoring and Troubleshooting Webex Meetings Using ThousandEyes by Rafat Kuraishi
- **BRKAPP-1012** - ThousandEyes 101 by Jonathan Zarkower
- **PSOAPP-1010**- End User Experience in the Modern World by Alex Cruz Farmer
- **BRKAPP-1010** - Delivering Optimal App Experiences in a Complex Cloud Ecosystem by Chris Villemmez
- **BRKAPP-1003** -Finding Needles in a Haystack: Using ThousandEyes Data for Root Cause Analysis by Prab Singh

References

- [Firewall Configuration for Enterprise Agents](#)
- [Cloud agent's world Map](#)
- [Network Tests Explained](#)
- [View the ThousandEyes Getting Started tutorial.](#)
- [Automatic Session Testing](#)
- [Installing Enterprise Agent on Cat8K](#)
- [Webex Monitoring](#)
- [Reasons for Missing Information on the Visualization View](#)

Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
- Attendees will also earn 100 points in the Cisco Live Game for every survey completed.
- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.



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Cisco Learning Network

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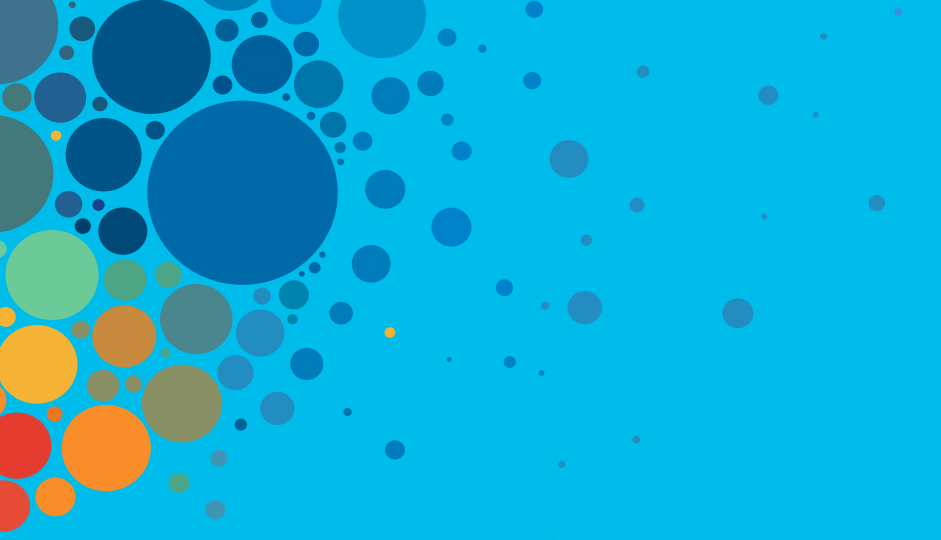
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- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand



The bridge to possible

Thank you

Appendix

Supplementary Tools for Monitoring and Troubleshooting Webex



Webex App Health Checker

- Help > Health Checker > Audio and Video Statistics
- Indicates TCP or UDP w/ Source Port
- Latency / Packet Loss / Jitter
- CPU and Memory Utilization
- Current Video Resolutions (RX and TX)
- Sharing Content Statistics

Audio & Video Statistics

You're now viewing high-quality video.

Overall CPU usage: 28%
Webex CPU usage: 6%
Overall memory utilization: 96% (15604 MB/16087 MB)
Webex memory utilization: 4% (659 MB/16087 MB)

Audio & Video Connection

Video codec: H.264-AVC
Voip codec (computer audio): Opus
Connection ports:
Audio: UDP (60635) Video: UDP (60634)

	Send	Receive
General		
Bandwidth	623 kb/s	660 kb/s
Audio		
Latency	23 ms	20 ms
Jitter	7 ms	36 ms
Packet loss	0 %	0 %
Video		

Control Hub Alerts

- Alerts allows us to get alerts live, on meetings with potential connection issues
- Quality threshold reached (packet loss, jitter, latency) or combination thereof
- Delivery Channel via email or Webex app integration.

Create rule

Summary
Choose from 3 types of rules

Service: Meetings

Type: Live meeting monitoring

Severity:

Title:
Live meeting monitoring
Historical meeting quality trend
Historical meeting quality monitoring

Enabled: ☒

Target
Monitor up to 30 user emails or devices

☒ User email(s) ☐ Device name(s)

Enter user emails separated by commas

0/30 items

☐ Monitor all participants

Rules
Reaching one of these thresholds during a meeting will trigger a alert

		Thresholds		Duration
Audio	<input checked="" type="checkbox"/> Latency	>= 800 ms	Accumulated	8 min
	<input checked="" type="checkbox"/> Packet Loss	>= 8 %	Consecutive	3 min
	<input type="checkbox"/> Jitter	>= 800 ms		
Video	<input checked="" type="checkbox"/> Packet Loss	>= 8 %	Accumulated	8 min
	<input type="checkbox"/> Jitter	>= 800 ms	Consecutive	3 min
	<input checked="" type="checkbox"/> Latency	>= 800 ms		
Hardware	<input type="checkbox"/> CPU	>= 90 %	Accumulated	8 min
			Consecutive	3 min

On demand media test to Webex

- <https://mediatest.webex.com/#/main>

Cisco Webex Network Test

Getting Started 1 2 3

How is your device connected?

☒ With a cable (Wired)

☐ Without a cable (Wi-Fi/Wireless)

☐ I'm not sure how the device is connected

Start Testing



Cisco Webex Network Test

Test Results 1 2 3

<input checked="" type="checkbox"/> App	Successful
<input checked="" type="checkbox"/> Room System	Successful
<input checked="" type="checkbox"/> Call	Successful

TCP Connectivity	Passed
TCP Delay	42.15 ms
TCP Download speed	325.33 Mbits/s
TCP Upload speed	267.12 Mbits/s
UDP Connectivity	Passed
UDP Delay	37.50 ms
UDP Jitter (delay variation)	↓ 2.82 ms ↑ 2.44 ms
UDP Loss Rate	↓ 0.00% ↑ 0.00%

[Retest](#) | [Copy Results to Clipboard](#) | [More Details](#)

Webex Monitoring Service

Reference

webex Control Hub

Overview

Alerts center

MONITORING

Webex Experience

Analytics

Troubleshooting

Reports

MANAGEMENT

Users

Workspaces

Devices

Apps

Account

Troubleshooting

Meetings & Calls

Live Meetings

Status

Admin Activities

Connected UC

Logs

Cisco Webex Status

Webex Calling

Webex for BroadWorks

UCM Cloud

Webex Contact Center

Developer API

Webex Hybrid Services

Webex Cloud Registered Device

Webex Control Hub

Webex Teams

Webex Meetings

Webex Monitoring Service

Network Performance (Last 24 hours) [View Details](#)

Network Health

Connection

Video Mesh

Recent Resource Usage [View Details](#)

Monitoring Tool [View Details](#)

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Status.webex.com

- https://status.webex.com/incident/history?lang=en_US

The screenshot displays the Webex Status page. At the top, the Webex logo is on the left, and navigation links for 'Service Status', 'Incident History', 'Maintenance', and 'Help' are on the right. The main heading is 'Latest Webex Status Information', followed by a welcome message: 'Welcome to the Service Status page for Webex. Issues affecting Webex services are tracked below.' Below this are two buttons: 'Contact Support' and 'Product Info'. The services are listed in two columns, each with a chevron icon, a service name, and a status icon. The services include Webex Meetings, Webex App, Webex Control Hub, Webex Cloud Registered Device, Webex Calling, Webex Hybrid Services, Developer API, Webex Contact Center, UCM Cloud, and Webex for BroadWorks. At the bottom, there is a section for 'Upcoming Data Center Maintenance'.

Service	Status
Webex Meetings	Operational
Webex App	Operational
Webex Control Hub	Operational
Webex Cloud Registered Device	Operational
Webex Calling	Operational
Webex Hybrid Services	Operational
Developer API	Operational
Webex Contact Center	Operational
UCM Cloud	Operational
Webex for BroadWorks	Operational

Looking Glass

Gives a trace result to the Enterprise Edge IP addresses

<https://lg.webex.com/>

Looking Glass

Type of Query	IP Address	Node
<input type="radio"/> bgp		
<input type="radio"/> bgp advertised-routes		
<input type="radio"/> ping		
<input checked="" type="radio"/> trace - Note: This may take up to 3 minutes to return.	<input type="text" value="75.42.46.232"/>	<input type="text" value="dfw10-wxbb-crt01"/> ▼
<input type="button" value="Submit"/>		<input type="button" value="Reset"/>

Resolving Network-related Media Problems

- Enable QoS if possible
- Ensure UDP ports 5004 and 9000 are permitted
- Enable split tunnel if using VPN
- Check WiFi Connectivity, if possible, use Ethernet (at least to rule out WiFi)
- Check for routers with large buffers ([dslreports.com](https://www.dslreports.com) speed test)
- Check CPU utilization
- Increase Internet service speeds for optimal experience
- Consider a direct peering link (Webex Edge Connect)

Other Collaboration Use Cases With ThousandEyes



Disclaimer

The following slides are meant to provide an idea of the ThousandEyes capabilities, but **this does not mean that TAC or the Collaboration Business Unit supports the implementation and results of these Collaboration ThousandEyes tests.**

Currently, ThousandEyes supports monitoring Webex Meetings through Webex Cloud Agents and Automatic Session testing to Webex IP addresses. For more information about the ThousandEyes capabilities please contact your ThousandEyes account team

Webex Meetings Network Visibility Using ThousandEyes

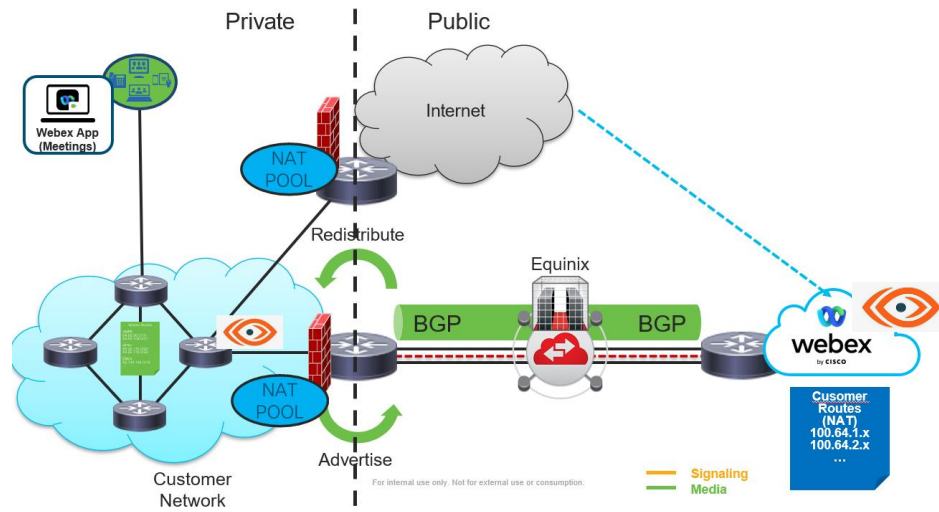
Reference

Benefits

- Visualize both forward and reverse network paths to isolate problem areas
- Facilitate proactive remediation before significant broadcast events (e.g., investor calls, town halls, etc.)
- Receive alerts based on custom thresholds of conditions that could impact user experience
- Rapidly identify problem domains (application, network, or third-party)
- Generate reports and share data with your providers for faster Mean Time to Repair/Mean Time to Identify (MTTR/MTTI)

Limitations

- Currently there is no Opus Codec Support for RTP tests



ThousandEyes + Webex Meetings

Webex Calling Multi-Tenant Network Visibility Using ThousandEyes

Reference

Implementation

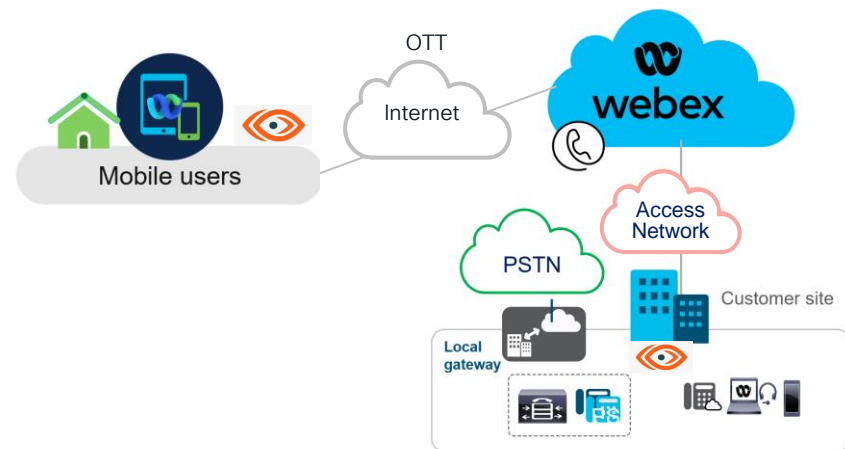
- Agent to Server Tests, no Webex Calling Cloud Agent
- Agent to Agent between branch offices

Benefits

- Visualize forward network paths to isolate problem areas
- Receive alerts based on custom thresholds of conditions that could impact user experience
- Rapidly identify problem domains
- Generate reports and share data with your providers for faster Mean Time to Repair/Mean Time to Identify (MTTR/MTTI)

Limitations

- Agent to Server Tests, no Webex Calling Cloud Agent
- No easy way to get the destination IP address. To find out the Cloud SBC IP address, you can view the Local Gateway(LGW) IP address destination using *show call active voice brief* or *show voip rtp connections*. Packet capture from the IP phone
- If not using LGW, packet captures can help to determine the outbound proxy IP address of the phones



ThousandEyes + Webex Calling Multi-Tenant

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Webex Calling Dedicated Instance Network Visibility

Implementation

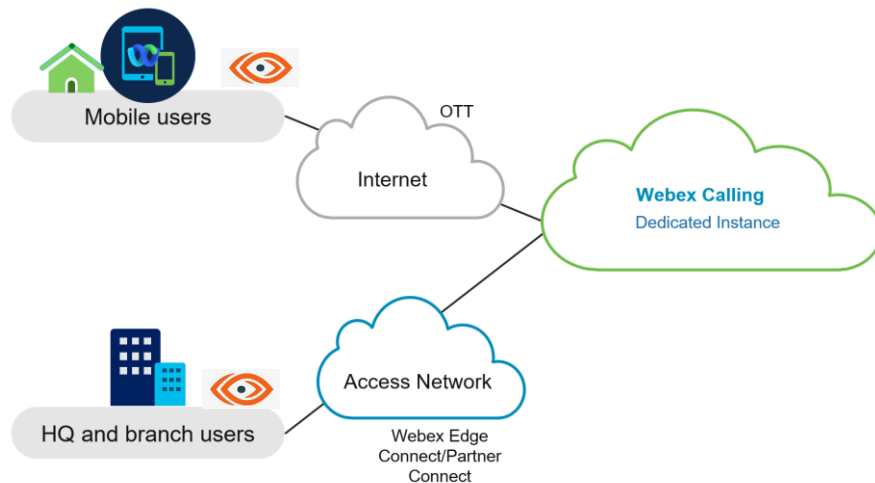
- Agent to Server Tests, no Webex Calling DI Cloud Agent
- Agent to Agent between branch offices
- Point the ThousandEyes agent test to Webex Calling DI Cloud SBCs and CUCM IP address for signaling

Benefits

- Visualize forward network paths to isolate problem areas
- Receive alerts based on custom thresholds of conditions that could impact user experience
- Rapidly identify problem domains
- Generate reports and share data with your providers for faster Mean Time to Repair/Mean Time to Identify (MTTR/MTTI)

Limitations

To find out the Cloud SBC IP address, you can view the Local Gateway(LGW) IP address destination using show call active voice brief or show voip rtp connections



Webex Contact Center Access Network Visibility

Reference

Implementation

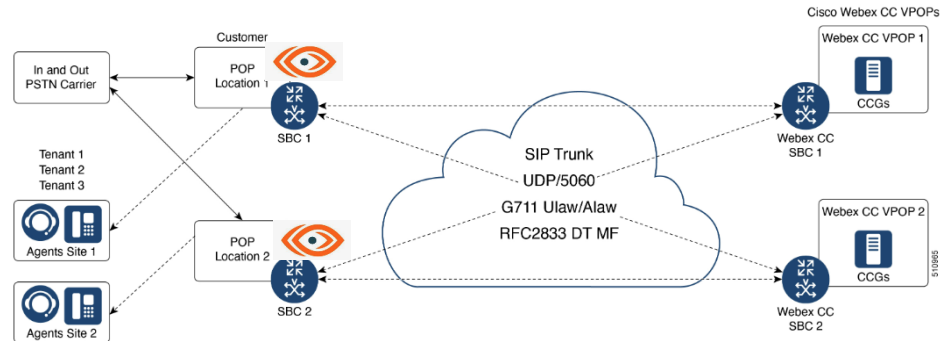
- Agent to Server Tests, no Webex Contact Center Cloud Agent
- Point the ThousandEyes agent test to Webex Contact Center SBCs

Benefits

- Visualize forward network paths to isolate problem areas
- Receive alerts based on custom thresholds of conditions that could impact user experience
- Rapidly identify problem domains
- Generate reports and share data with your providers for faster Mean Time to Repair/Mean Time to Identify (MTTR/MTTI)

Limitations

- ThousandEyes test do not resolve SRV records
- To find out the Cloud SBC IP address, you can view the cloud SBC IP address destination using show call active voice brief or show voip rtp connections



ThousandEyes, Webex Contact Center

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ThousandEyes agent Collocation with CUBE

Implementation

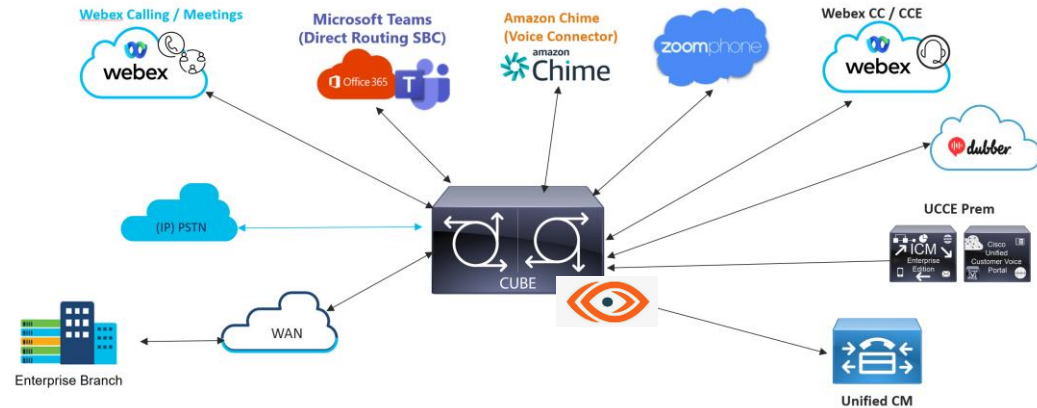
- [Install ThousandEyes Agent on Cat8K](#)
- Configure Agent to server network test or SIP test

Benefits

- Visualize forward network paths to isolate problem areas
- Receive alerts based on custom thresholds of conditions that could impact user experience
- Rapidly identify problem domains
- Generate reports and share data with your providers for faster Mean Time to Repair/Mean Time to Identify (MTTR/MTTI)

Limitations

- No MTLS support for SIP test
- Agent to server tests limited use TCP only



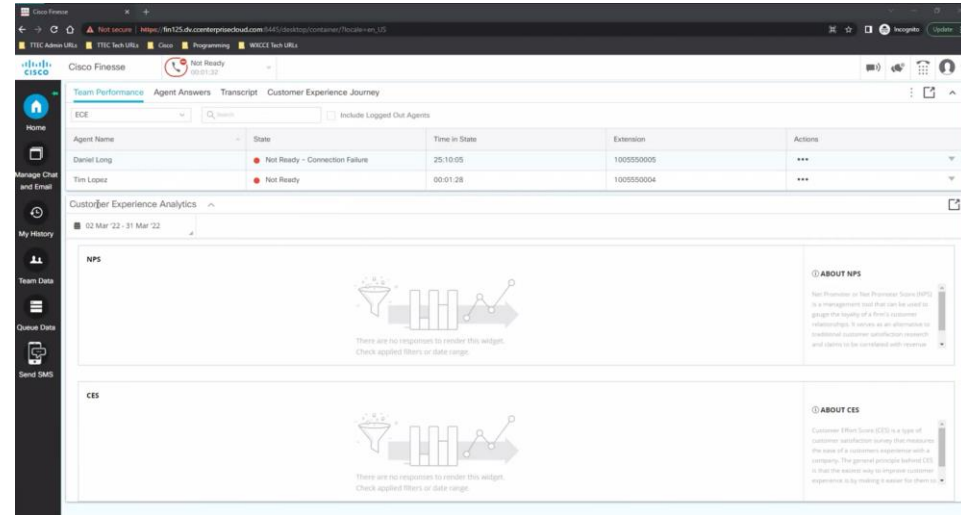
Deliver Finesse Agent Awareness of Network Traffic

Implementation

- Monitor Finesse using HTTP transaction tests
- Deploy ThousandEyes Enterprise Agent in the same network as the CC agent accessing Finesse

Benefits

Transaction tests measure Contact Center Agent web user experience using synthetic browser interactions. This type of test can uncover Web Page load times problems that aren't always apparent from the front



ThousandEyes + WCCE Finesse

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