Tech Club webinář

Ze života IT správce

Dominik Soukup
Jaroslav Čížek

17.9.2024

Network is critical!

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Seznamte se s Alexem, profesionálním IT správcem, který čelí problémům s Wi-Fi. Frustrovaný špatným připojením hledá Alex řešení. Přidejte se k nám na cestě za vyřešením Alexových síťových problémů…

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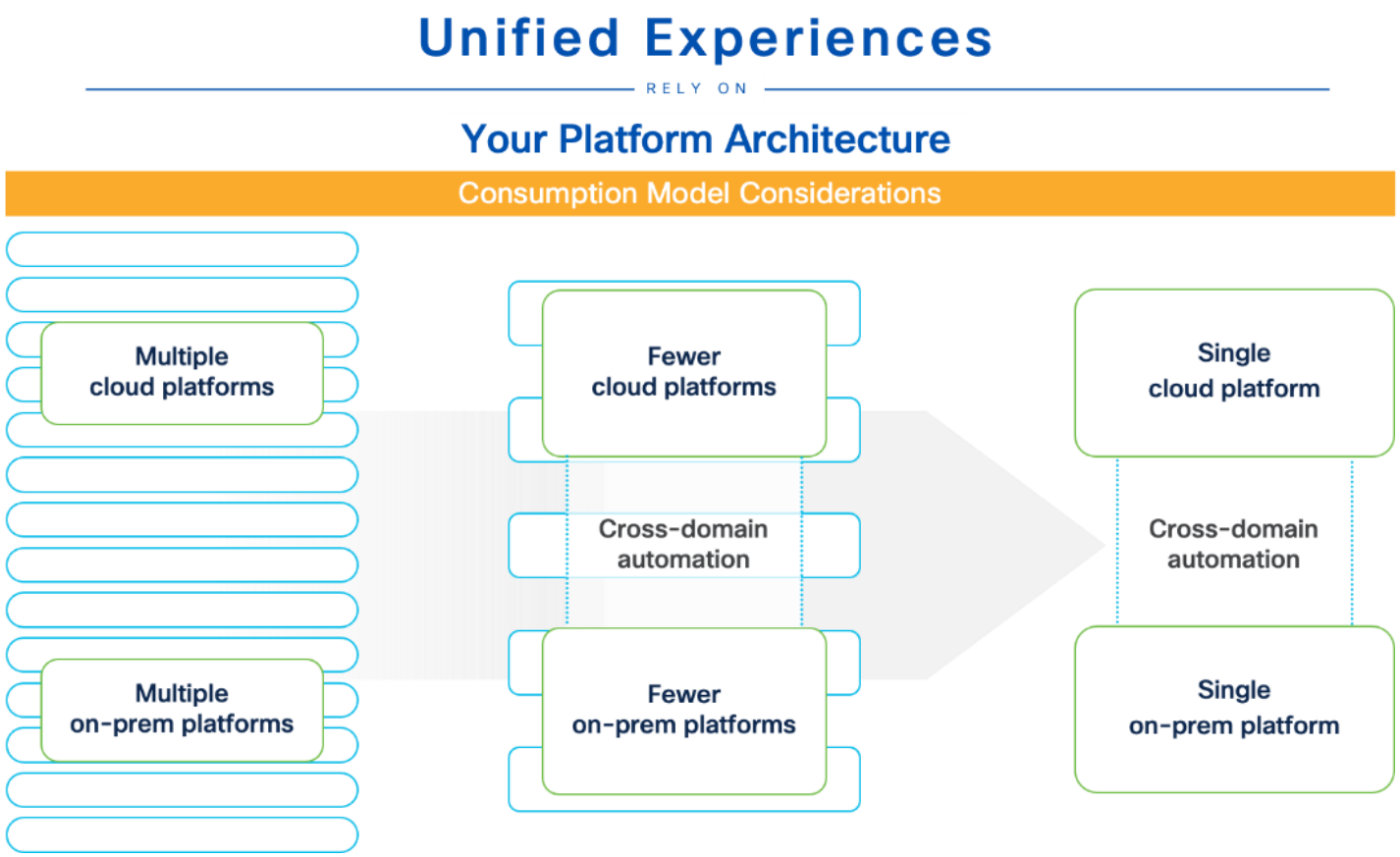
Agenda

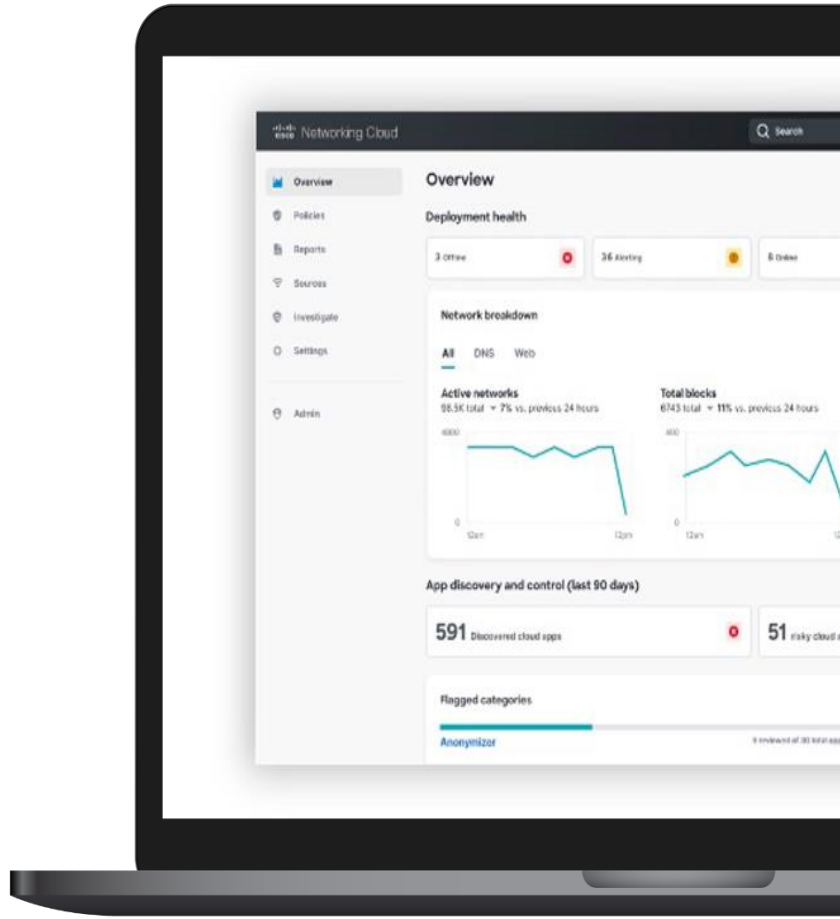
1. Možnosti využití Catalyst Centeru
2. Možnosti využití Meraki
3. Možnosti využití Thousand Eyes
4. Možnosti využití Spaces

V případě jakýchkoliv otázek se neváhejte ozvat a napsat nám je do chatu meetingu.

Cisco Networking Cloud

Integrating on-prem and cloud operating models





Greater simplicity, everywhere, at every scale

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Cisco Platform Strategy

Data Powered Insights/ AIOps

Open API and Integrations

Platform Scale and Continuous Innovation

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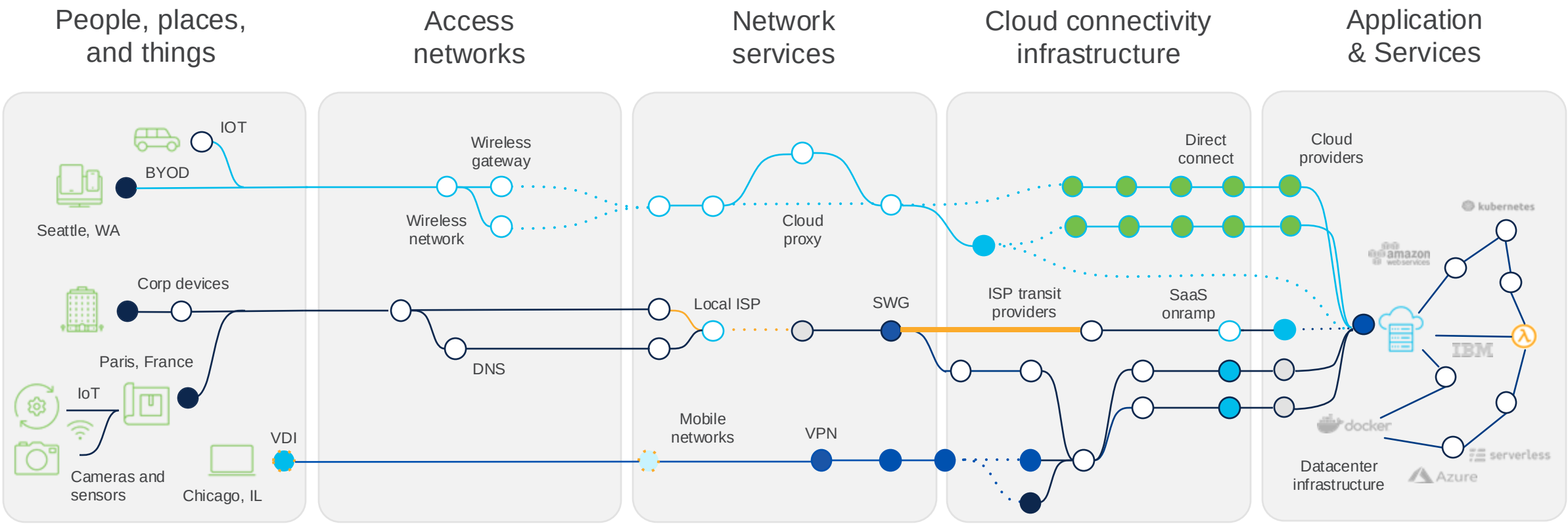
Networks are More Complex Than You Think



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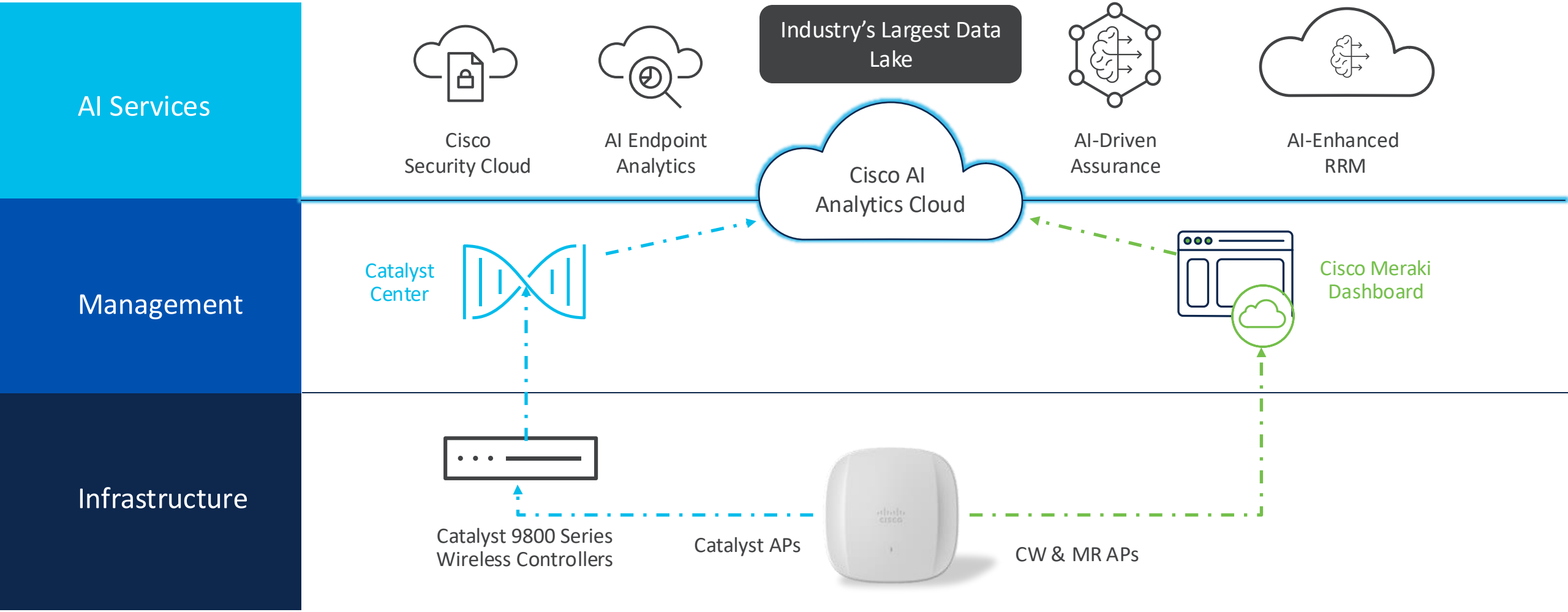
Unifying AI Technology for Cisco Wireless



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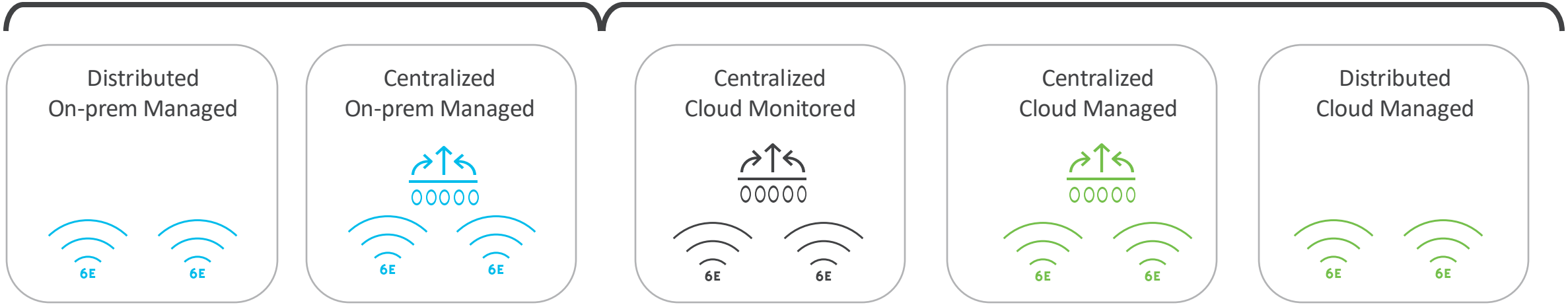
Deployment Options

Catalyst Center

Meraki



Retail & Branch Offices (On-prem)

Campus network (On-prem)

Campus network (Hybrid)

Campus network (Cloud)

Retail & Branch Offices (Cloud)

Catalyst AP

Catalyst 28/30/48/91/CW9100

Meraki MR
Catalyst 9162/64/66

Catalyst WLC

Catalyst 9800

Meraki MCG*

* Future Product

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Problém č.1: „Pan ředitel se není schopen připojit k Wi-Fi z jeho soukromého telefonu. Priorita nejvyšší, potřebuje si stáhnout fotky!”

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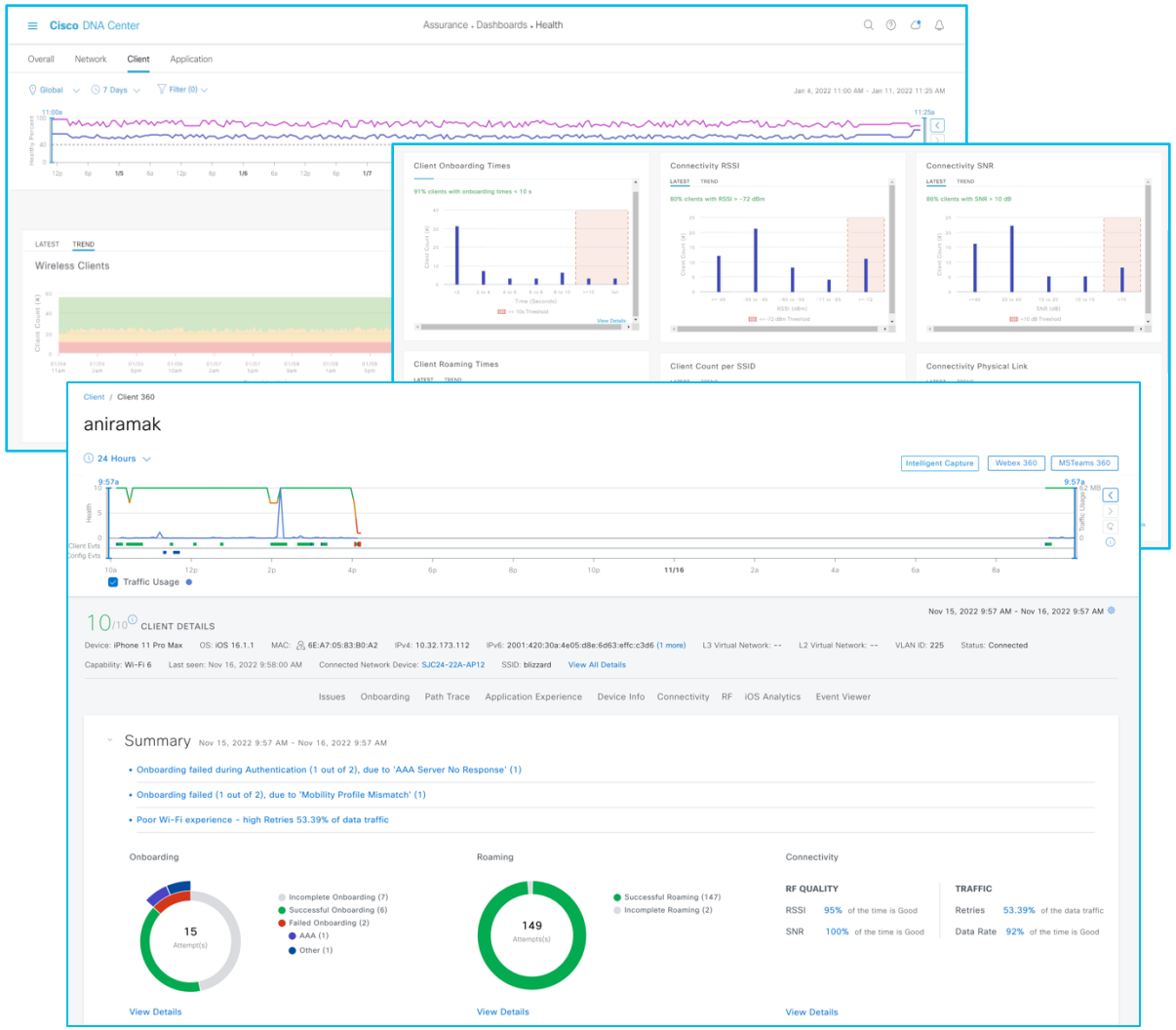
Wireless Troubleshooting using Catalyst Center - Client Health Dashboard, Client 360 View

- Easily troubleshoot client issues
- Client 360 displays summary of key issues
- Onboarding, Roaming, Connectivity details including top failure reasons
- Event viewer displays event correlating to issue
- Impact analysis can be used to view Top AP's, floors, SSID's and device types impacted by same issue
- Correlation can be used to select KPI's for client, AP, WLC and switch



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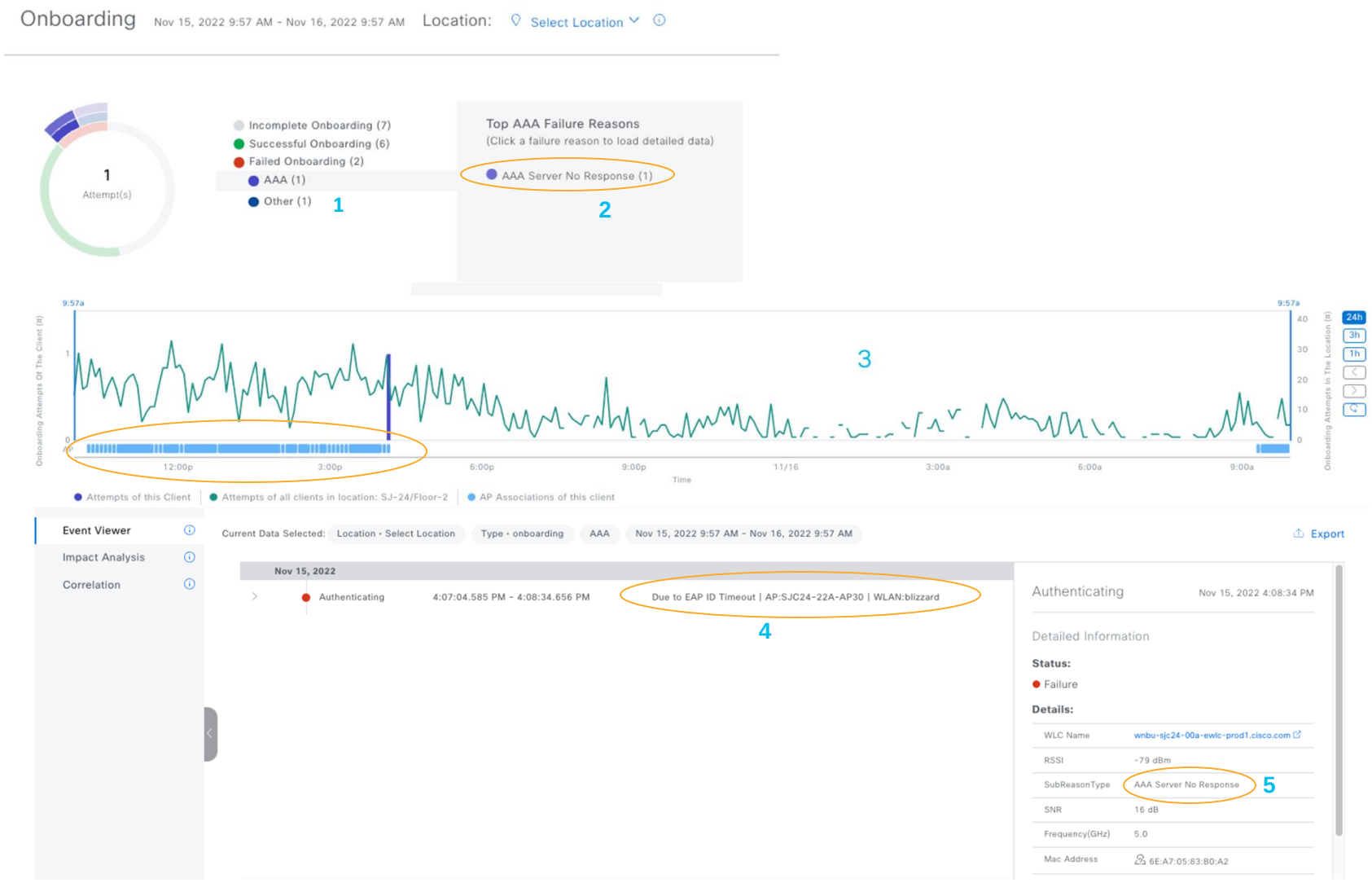
Wireless Troubleshooting using Catalyst Center - Client troubleshooting is all about correlation

- View top failure reasons
- Event viewer displays event correlating to issue
- Impact analysis to view devices impacted by the same issue
- Correlation can be used to select KPI's for client, AP, WLC and switch



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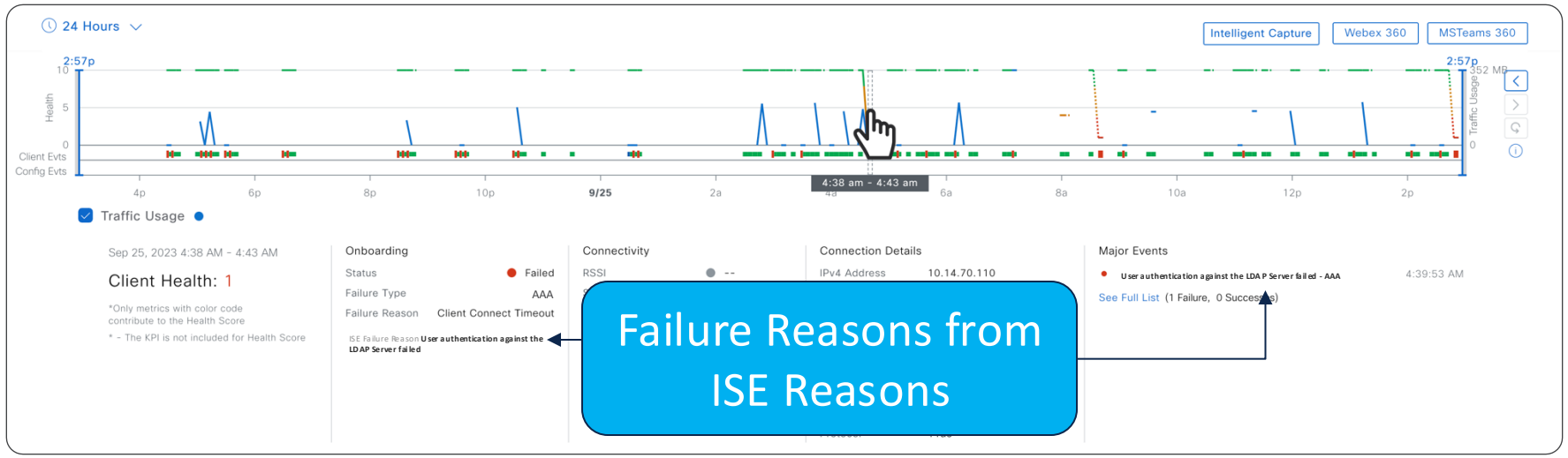
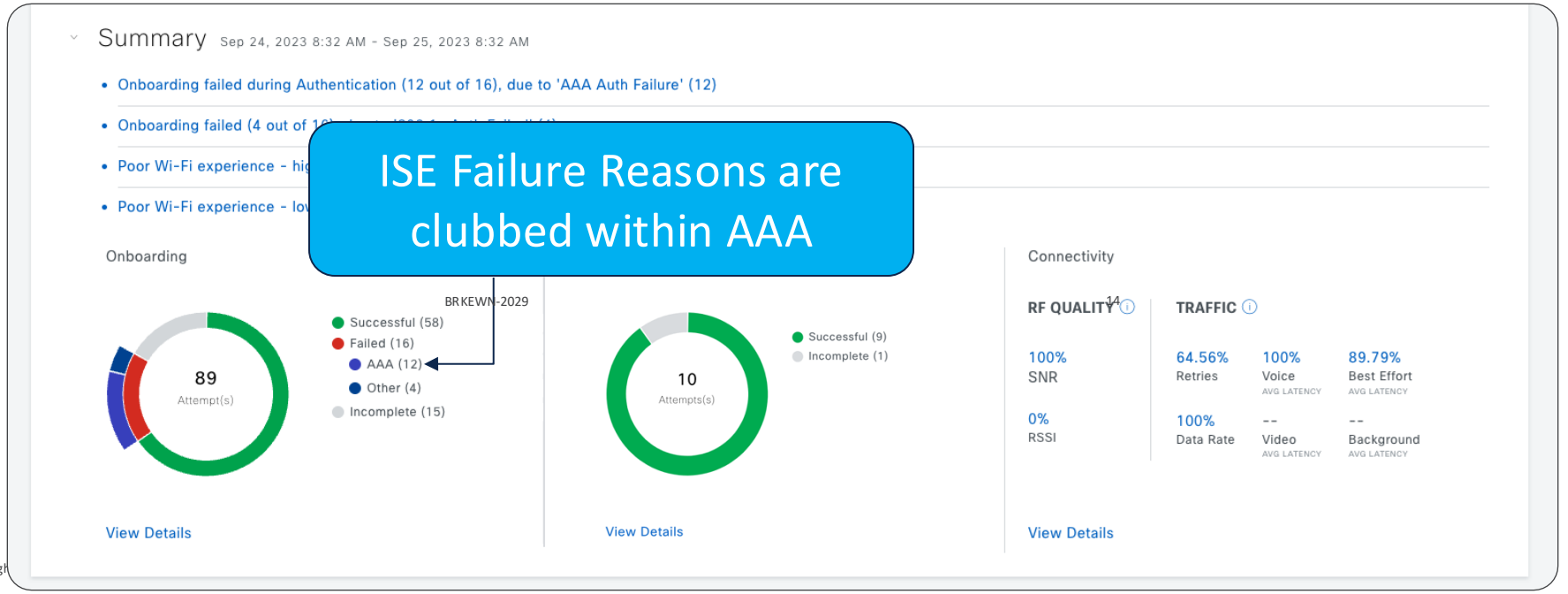
ISE Failures Added to Client 360

Catalyst Center License: Advantage
Catalyst Center Version: TBD
ISE Version: 3.2p7 & 3.3p3
ISE License: Advantage

Network Timeline



Summary Widget



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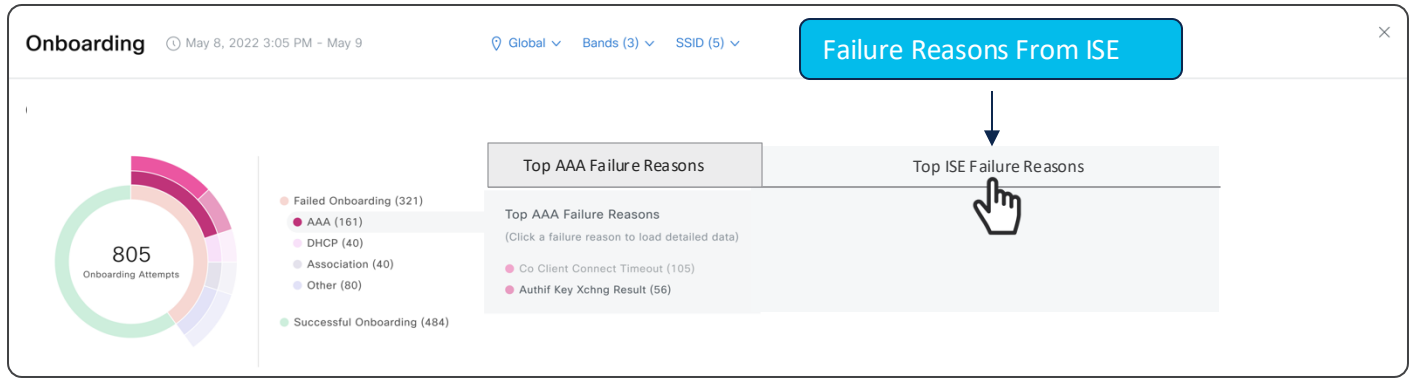
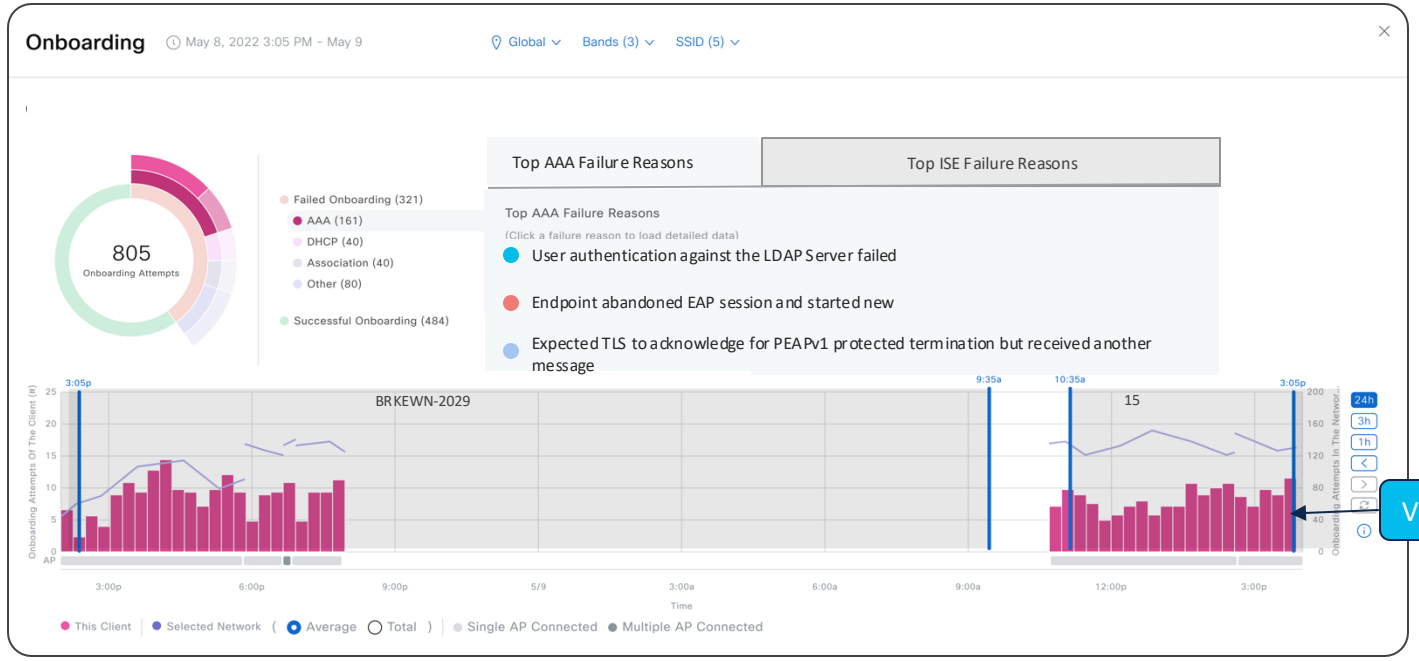
Detailed ISE Failures Summary Widget Integration

AAA Failures
(Sent from WLC)



ISE Failure
(Sent from ISE)



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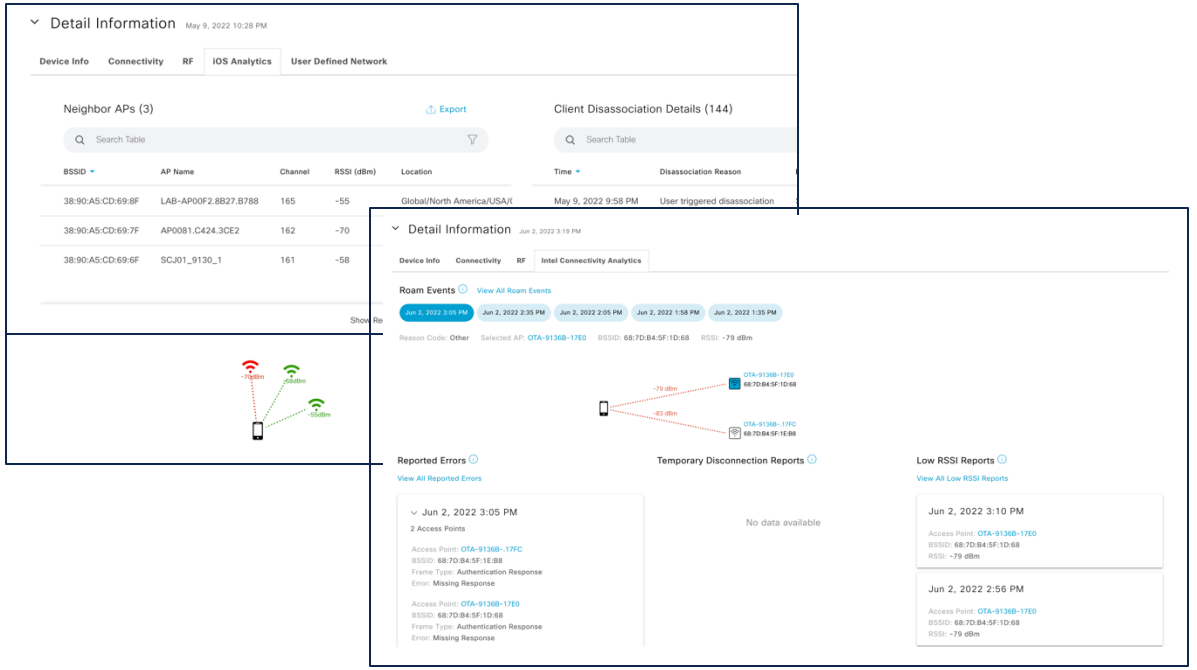
Wireless Troubleshooting using Catalyst Center - Apple, Samsung, Intel Client-side Analytics

- Apple iOS+MacBook Analytics
  - Detailed disassociate reasons
  - Neighboring APs, BSSID, RSSI
  - Enhanced device classification
- Samsung Analytics
  - Detailed disassociate reasons
  - Enhanced device classification
- Intel Analytics
  - Issue reporting, roam and disassociate reasons
  - Neighboring APs, BSSID, RSSI
  - Enhanced device classification



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Wireless Troubleshooting using Catalyst Center - Intelligent Capture (iCap)

- Client Dashboard
  - 14 Day Time Travel
  - Anomaly Packet Capture, Data Packet Capture
  - Real-Time Client Location
  - Client Statistics
- AP Dashboard
  - 14 Day Time Travel
  - Always-on AP RF Statistics
  - On-demand Spectrum Analysis

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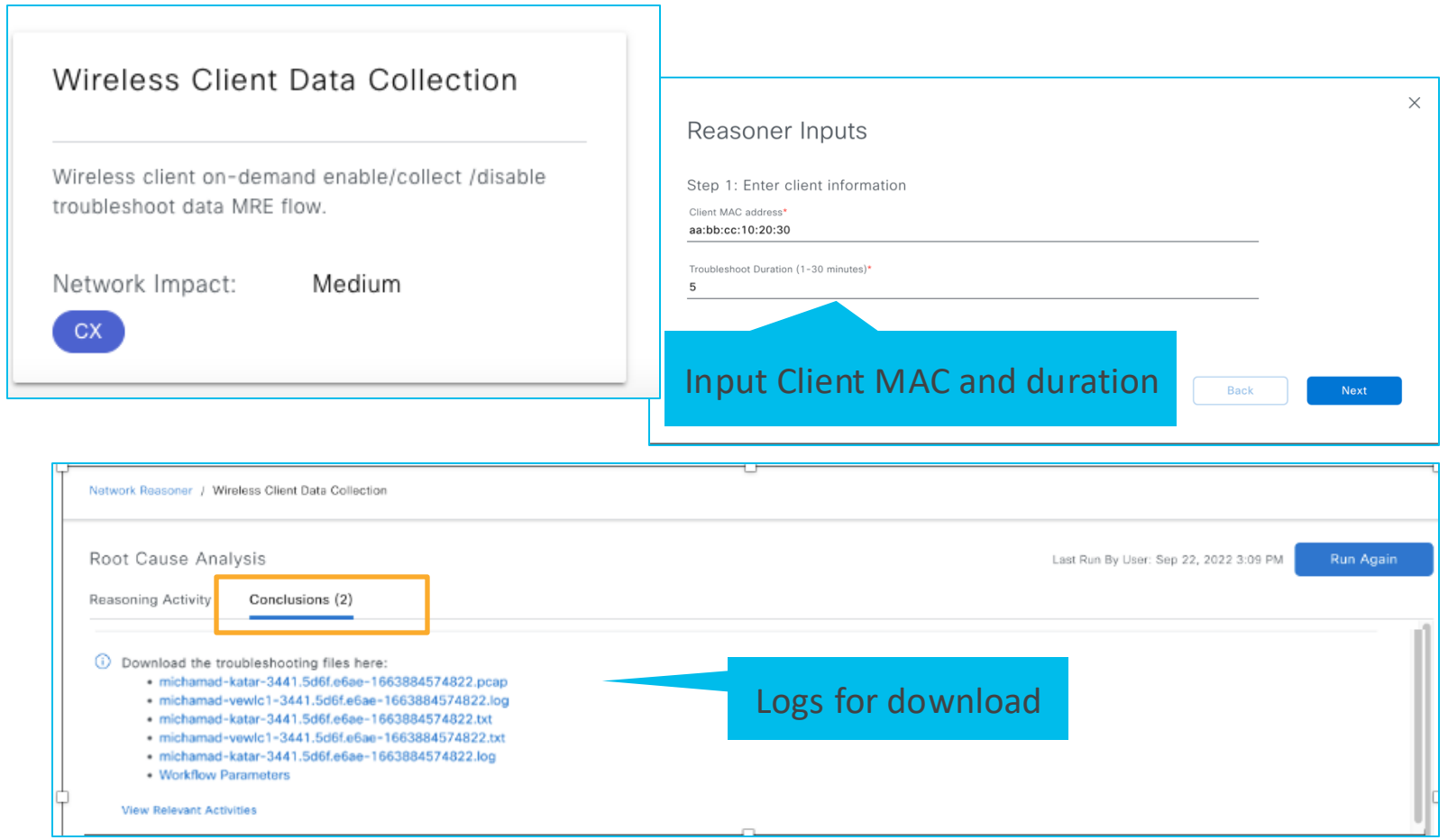
Wireless Troubleshooting using Catalyst Center - MRE Workflow – Wireless Client Troubleshooting

- Easily collect client logs from WLC for troubleshooting
- Input client, duration, WLC to setup log collection
- After set duration conclusions will have the data that can be downloaded for analysis



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Problém č.2: „Ze skladu na druhé straně republiky otevřeli ticket, že prej se jim někdy pomaleji připojují čtečky do sítě a že to i občas při pojiždění mezi regálama vypadne …”

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Catalyst Center - AI-Driven Baseline Dashboard

Pinpoint buildings with clients that have onboarding issues

Pain Points

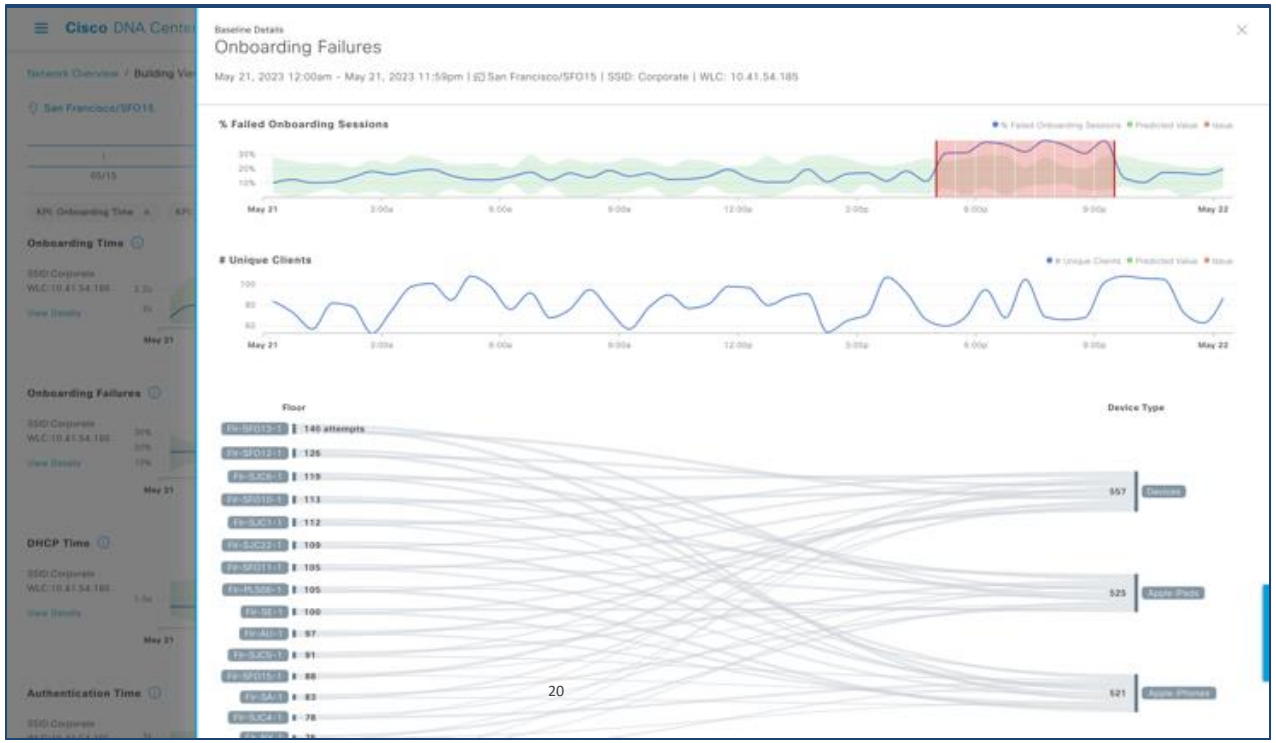
Wireless networks are dynamic and issues triggered with a static min/max threshold may result in false positives.

Feature Capability

Identifying client onboarding KPIs that deviate from the norm, and provides unique view to RCA the issues.

Customer Benefits

Users receive accurate alerts for significant deviations in onboarding issues and providing a triaging view.



Intuitive View to Pinpoint the Source of Failure

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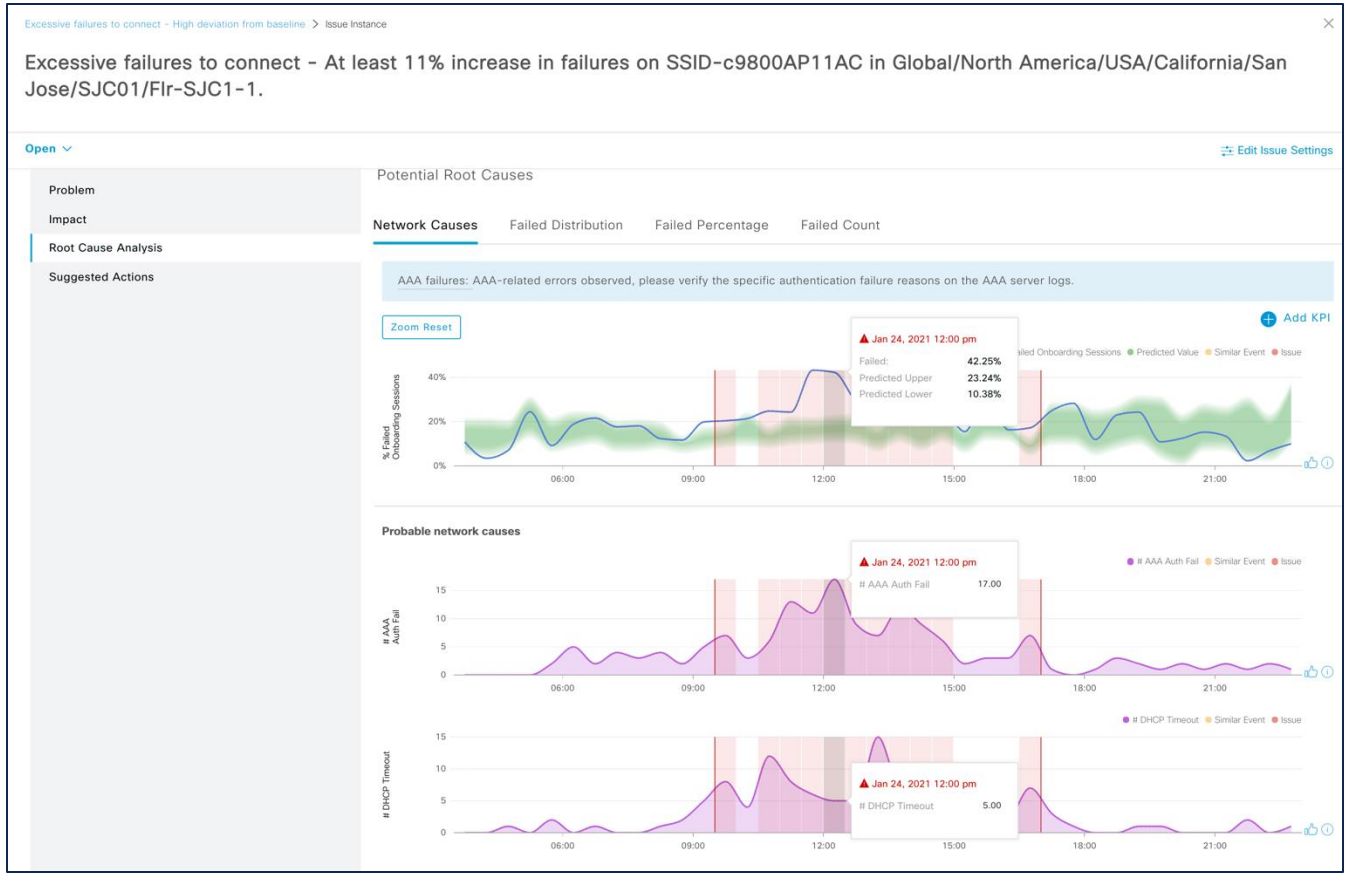
Catalyst Center - Cisco AI Network Analytics
Feature Summary

AI Driven Issues

Discover and Root Cause network risks and anomalies from the AI-generated baselines

13 KPIs: Onboarding & Throughput



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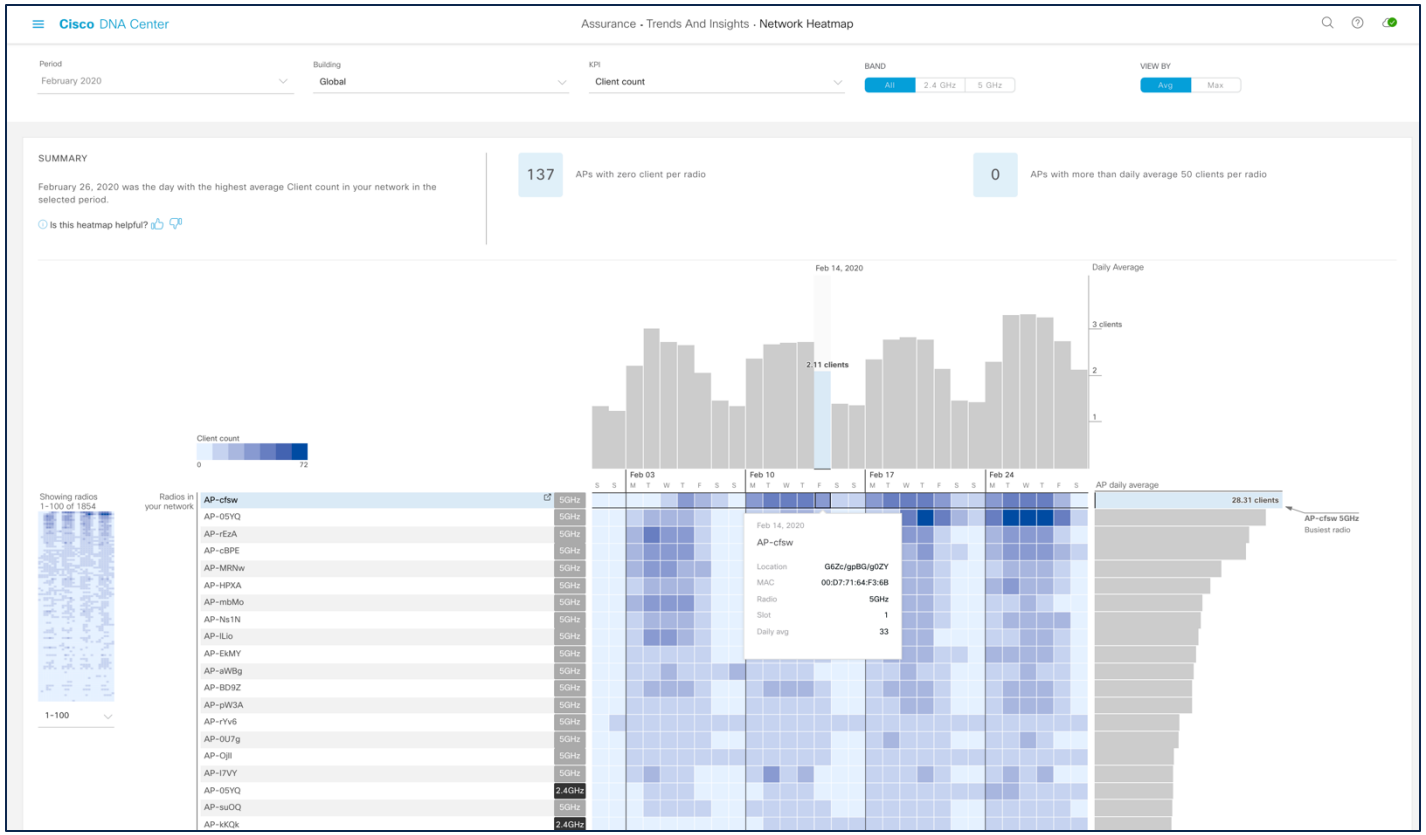
Catalyst Center - Cisco AI Network Analytics
Feature Summary

Network Heatmaps

Optimize AP Performance across the network through visual exploration of performance KPIs

17 KPIs: RF & Application



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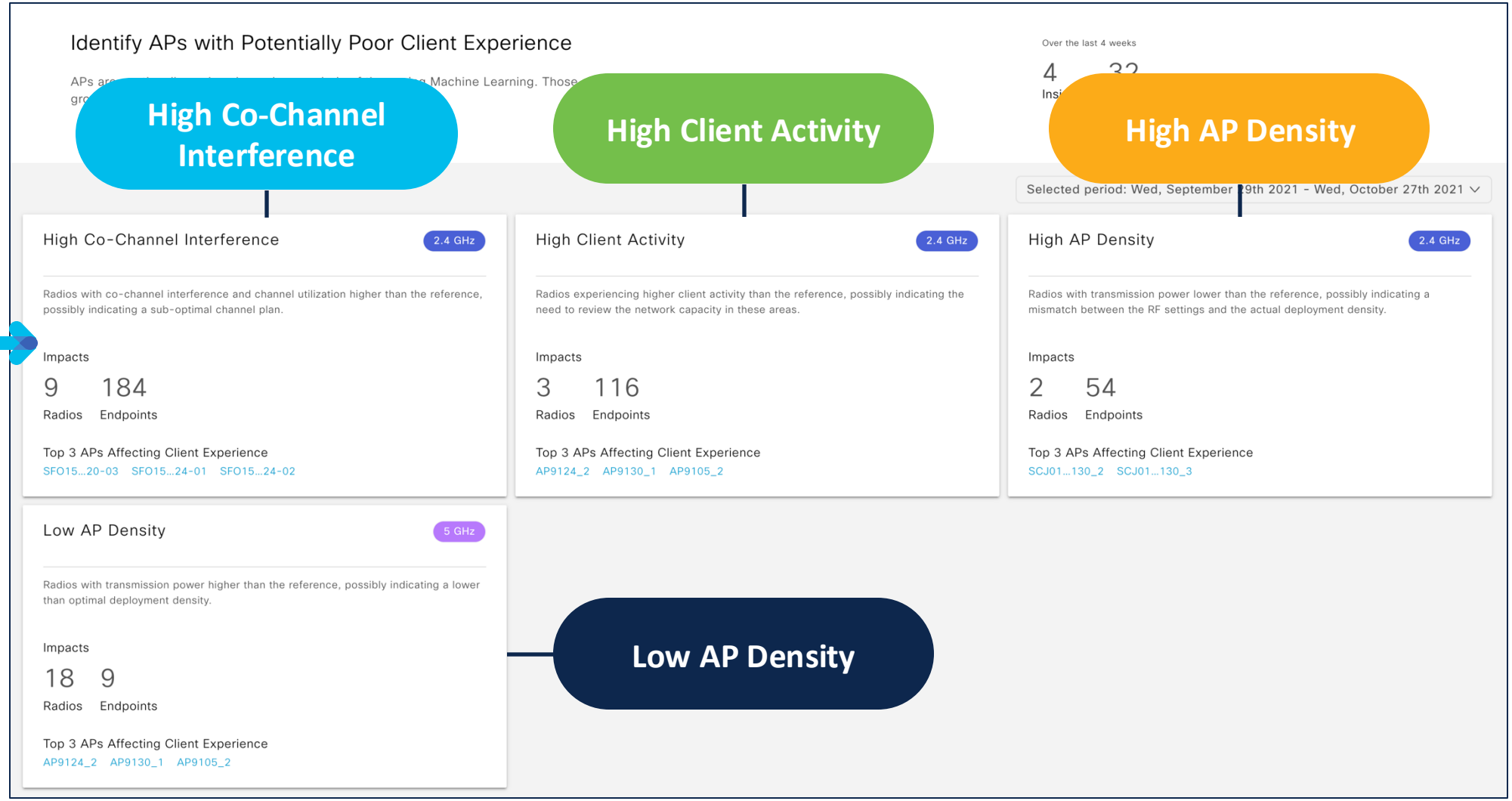
Catalyst Center - AI-Driven AP Performance Advisories



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Problém č. 3: „Kluci z IT oddělení mají problém s novýma IoT senzorama. Nešlo by to nějak nachytat??”

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Introducing OTA Sniffer with Intelligent Capture

Capture All Packets on AP Supported Bands from 2.3.7!

1. Perform OTA channel packet capture from anywhere in your wireless network remotely.

2. Diagnose wireless roaming, non-roaming, and any other issues at the channel level.

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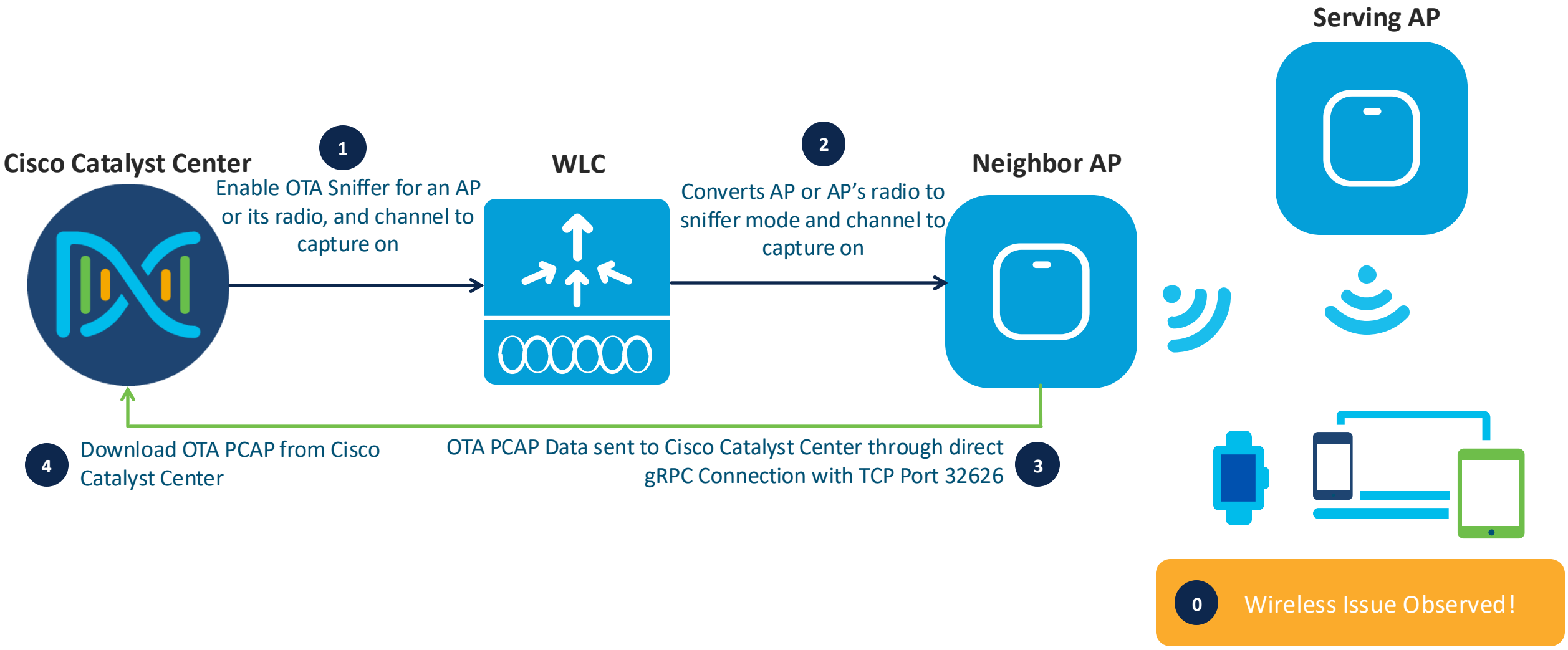
Intelligent Capture OTA Sniffer Topology



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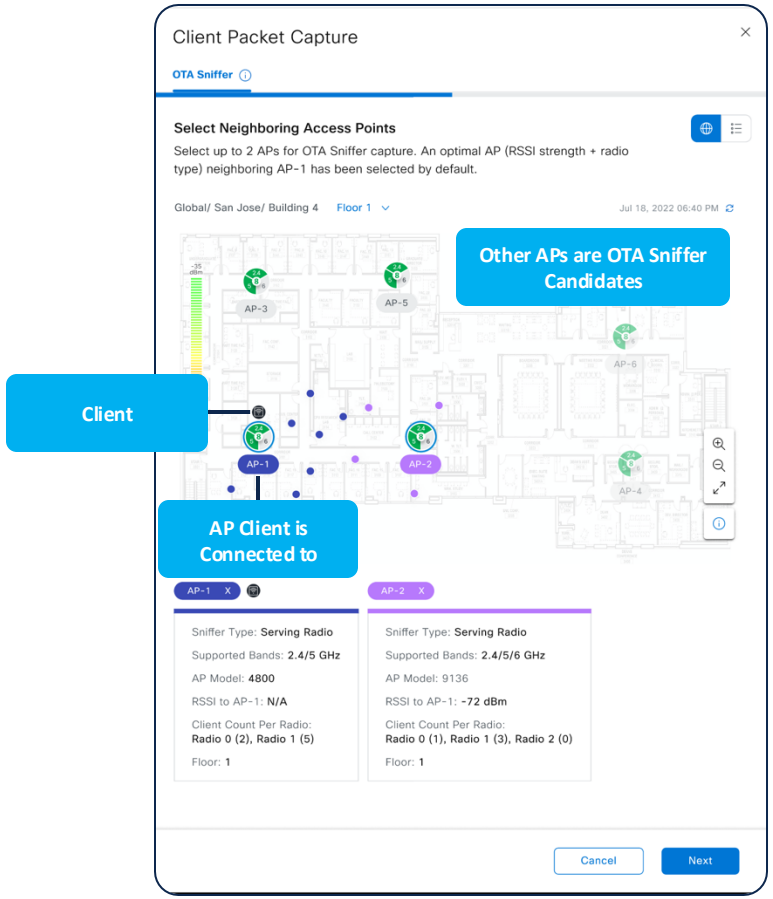
Next Level Serviceability with the OTA Sniffer Capture

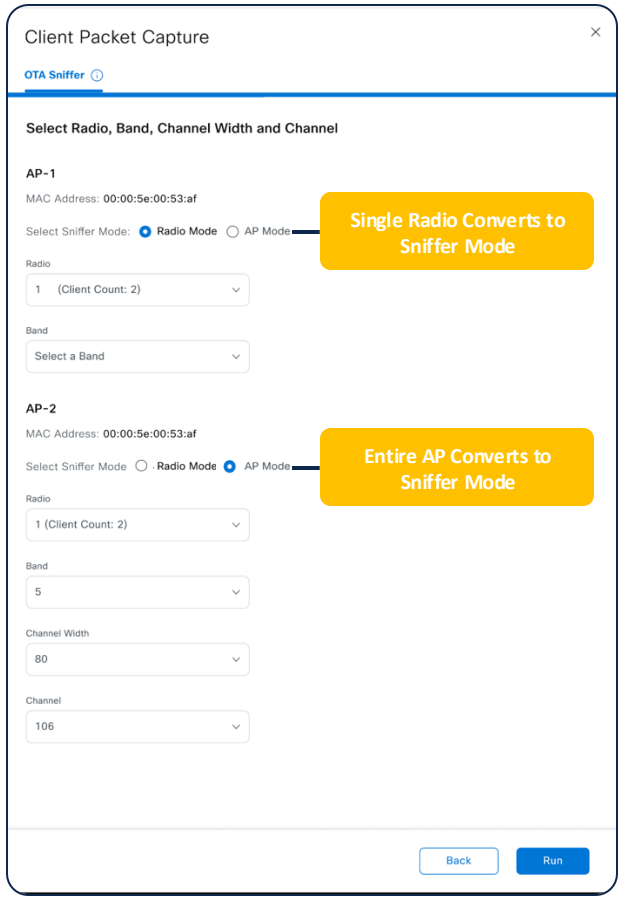
Intelligent Capture can now capture ALL packets on a defined band from 2.3.7

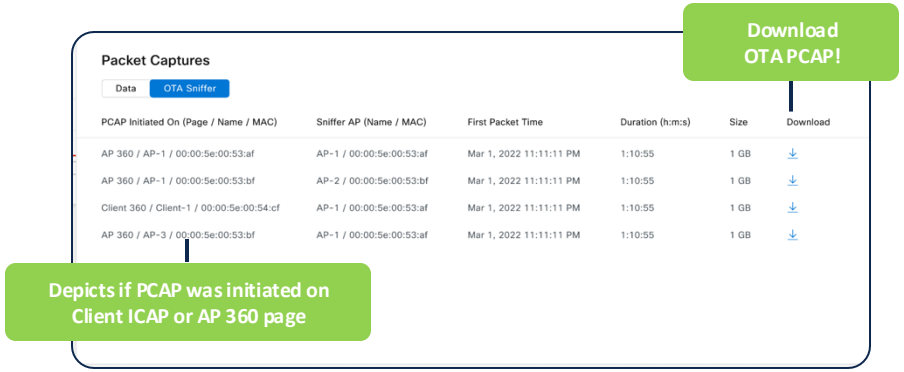
1 Start OTA PCAP on **Client or AP 360** and Select Up to 2 APs

2 Define Radio and Band to Capture and Start it!

3 Download the OTA PCAPs Directly on the Page!







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Problém č.4: „Už zase musím přeladťovat kanály na APčkách, to konferenční centrum ve vedlejší budově nám byl čert dlužen …”

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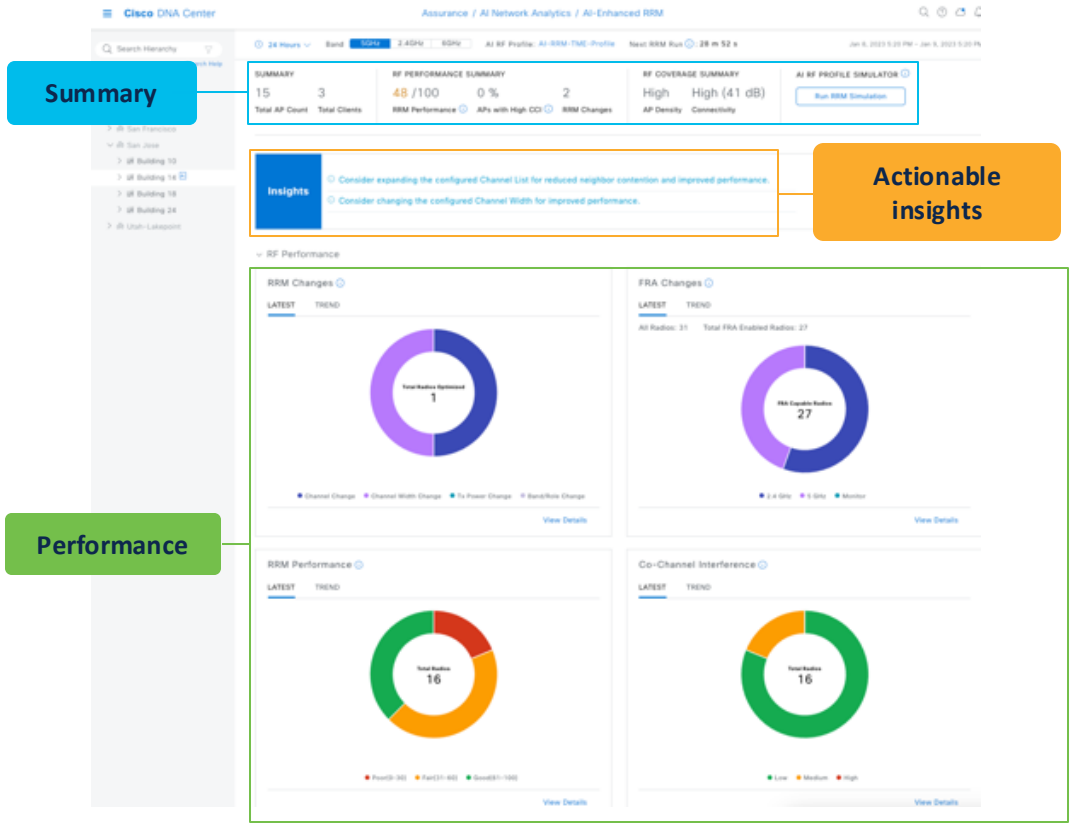
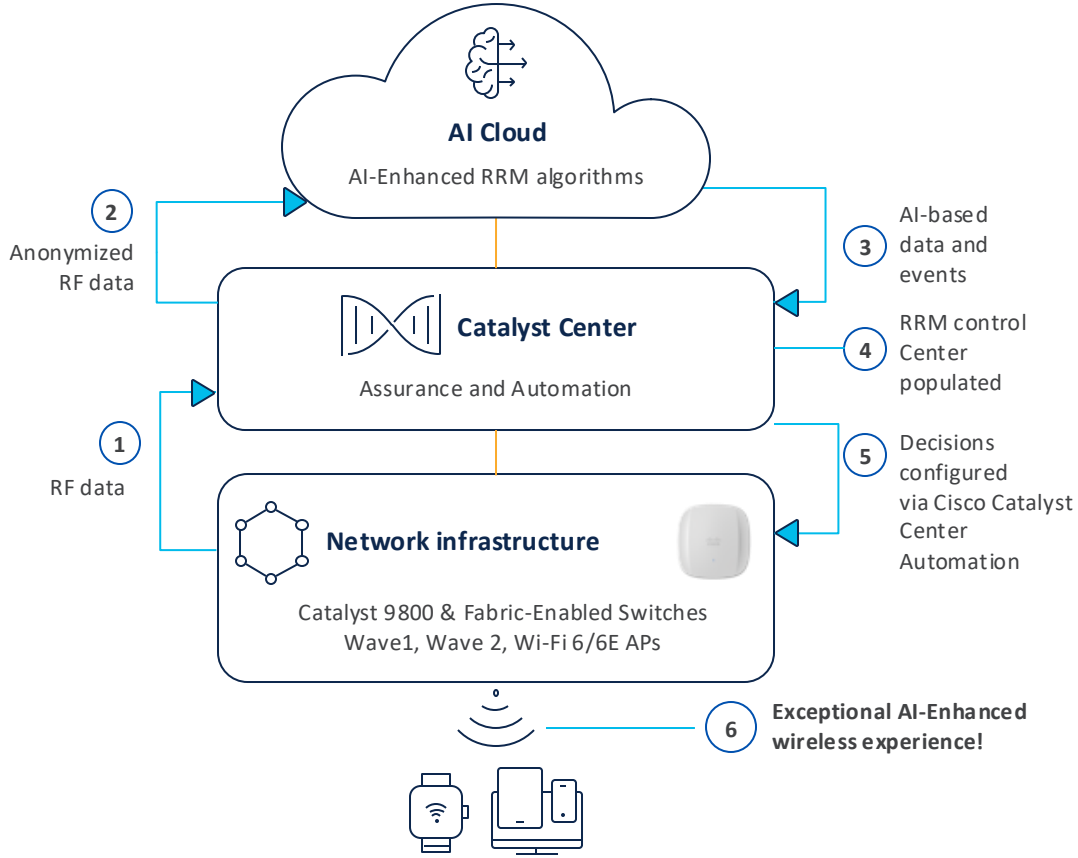
AI-Enhanced RRM is AI that Powers RF Optimization

Provides Users with Better Wi-Fi and Admins with a Better RF Management Experience!

Instantaneous visibility



Proactive optimizations



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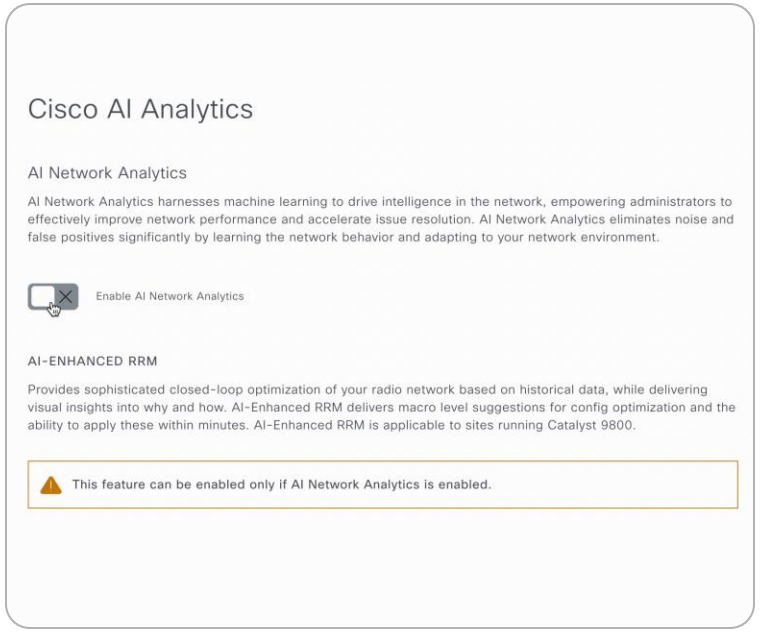
AI-Enhanced RRM is AI that Powers RF Optimization

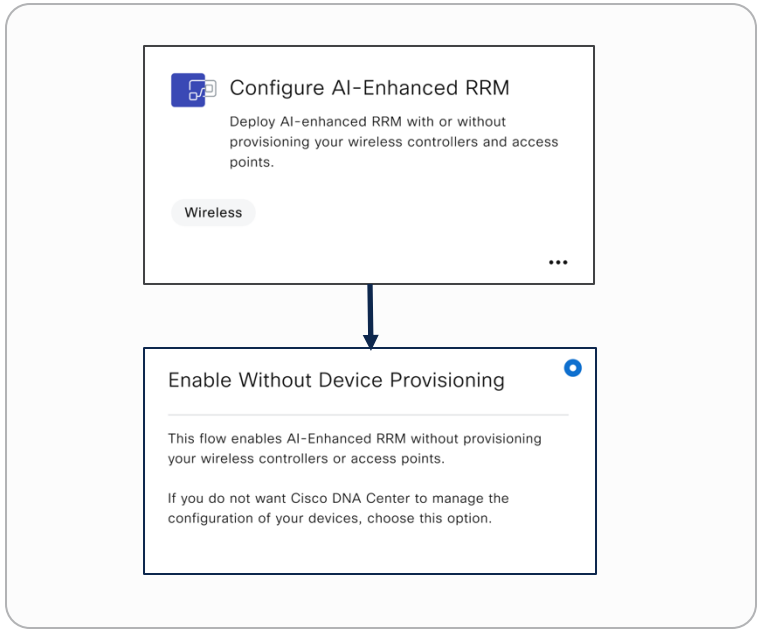
We've created a new enablement workflow that doesn't require admins to manage their network configurations on Catalyst Center!

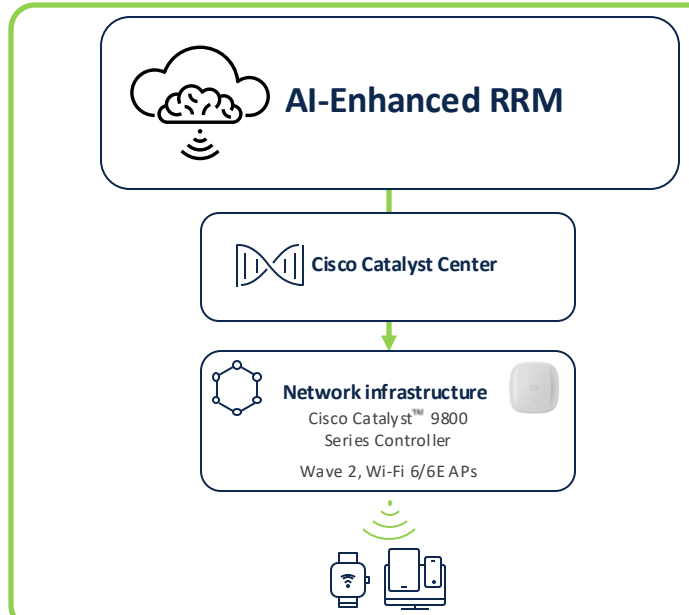
1 Enable AI-Enhanced RRM cloud access in Settings

2 Select the newly designed workflow and deployment option!

3 AI-Enhanced RRM is enabled without device provisioning!







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Software and Hardware Support Matrix
for AI-Enhanced RRM's Workflow for Assurance-Only Deployments

Cisco IOS XE WLC Software	Cisco Catalyst Center Software and Licensing
17.9.3 or newer (17.12.1 recommended)	2.3.7.4 (Patch 2) with DNA Advantage License

Cisco Access Point Hardware
Wave 1, Wave 2, Catalyst Wi-Fi 6 and 6E Access Points

Cisco IOS XE WLC Hardware
C9800-CL
C9800-L
C9800-40
C9800-80

cisco
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Problém č. 5: „Hmmm … Wireless jsem zkontroloval, ten je v pořádku … že by byl problém s WIRED infra?”

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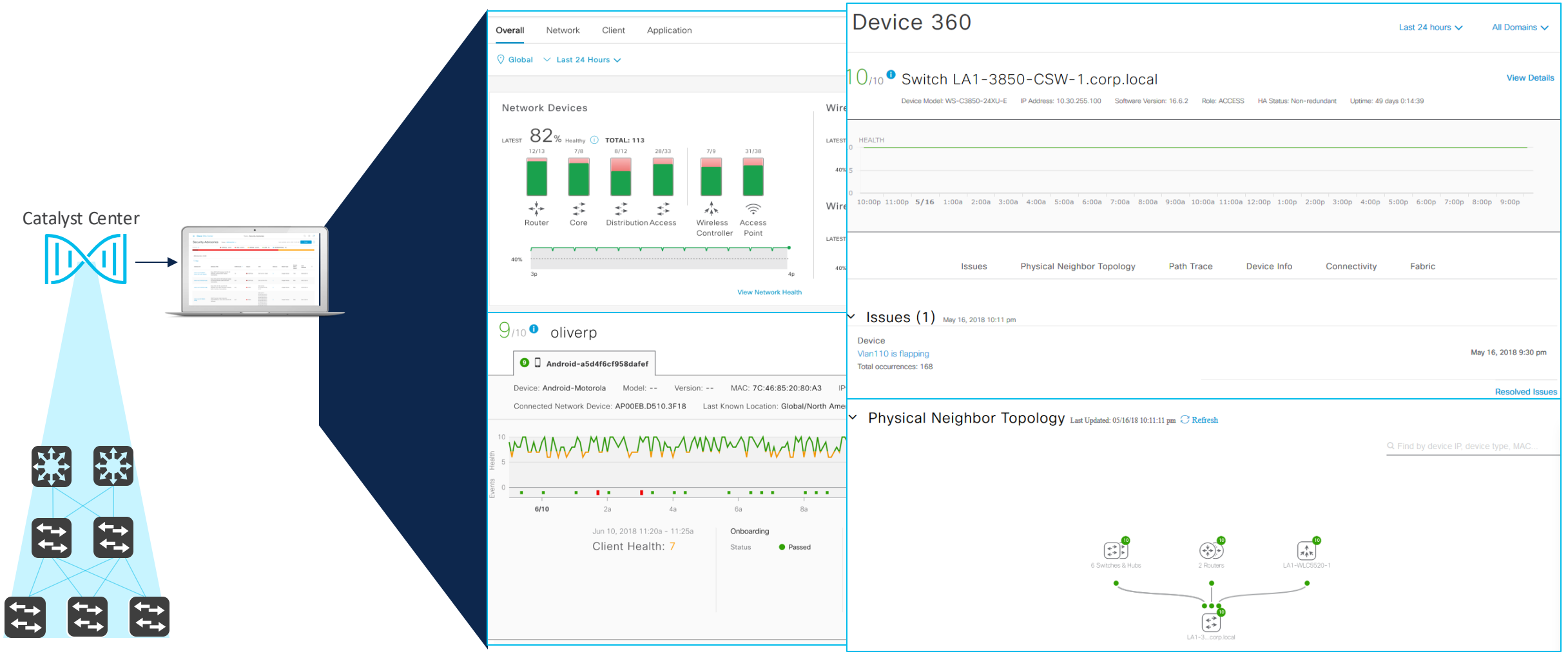
Catalyst Center – Network, Device and Client Health



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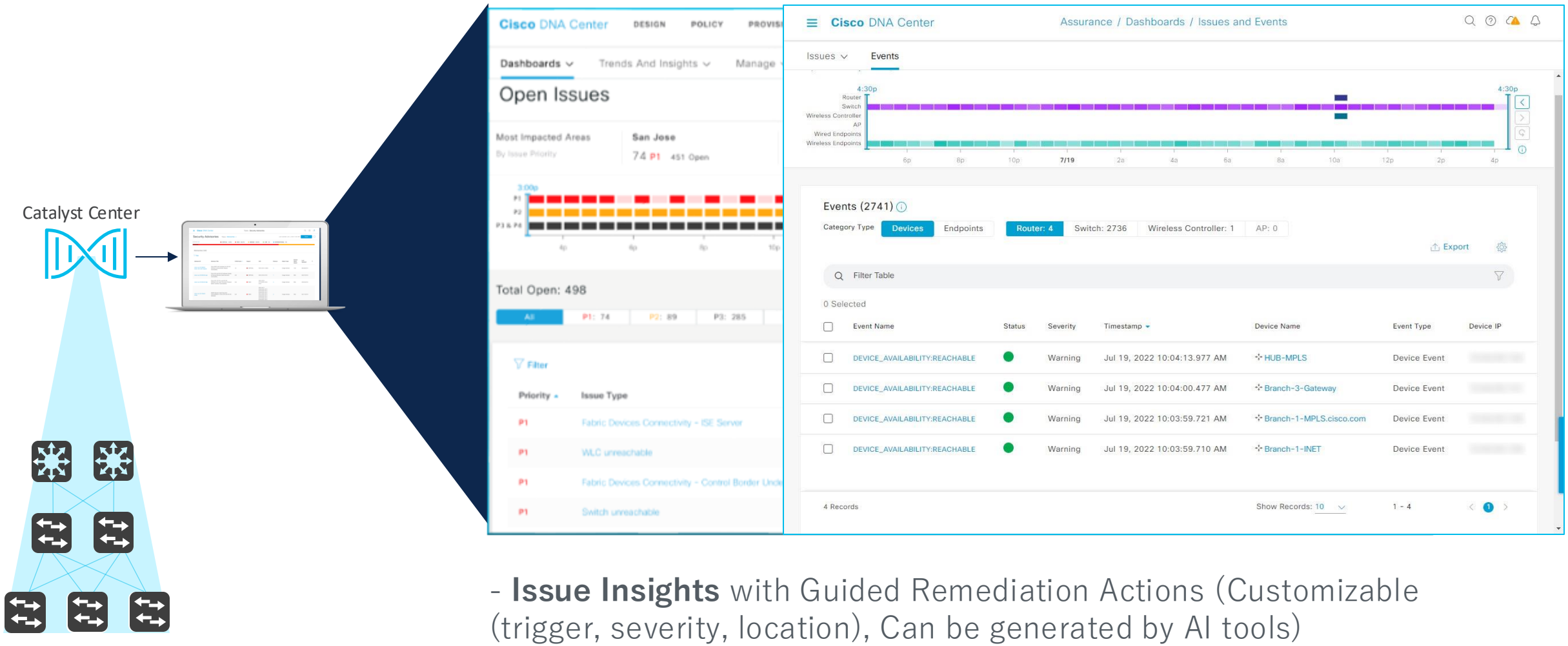
Catalyst Center – Issues, Events



- **Issue Insights** with Guided Remediation Actions (Customizable (trigger, severity, location), Can be generated by AI tools)
- **Events** are syslog/trap/telemetry data sent to Cisco Catalyst Center Viewable in context for device/user 360 or globally, Event Analytics

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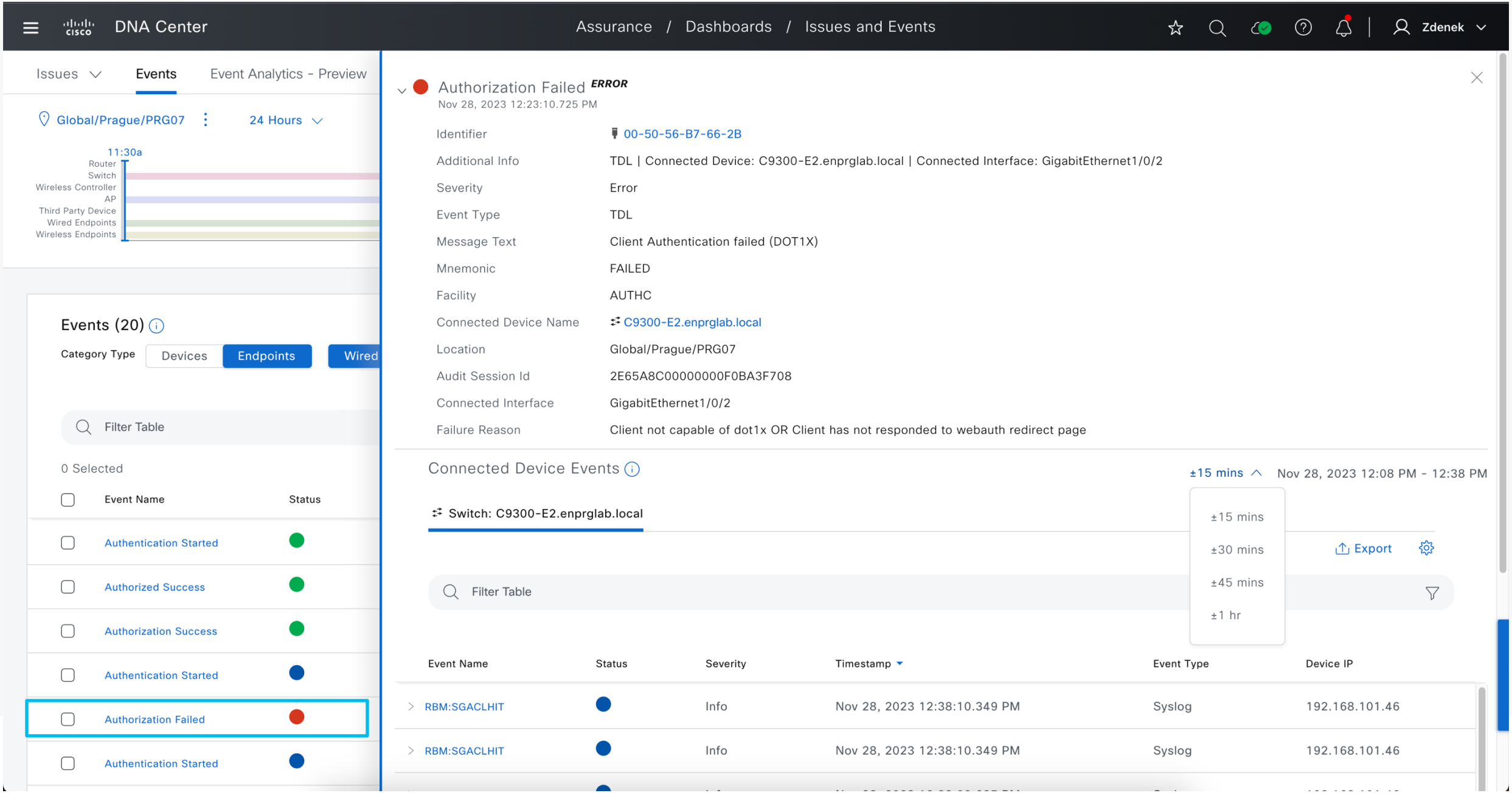
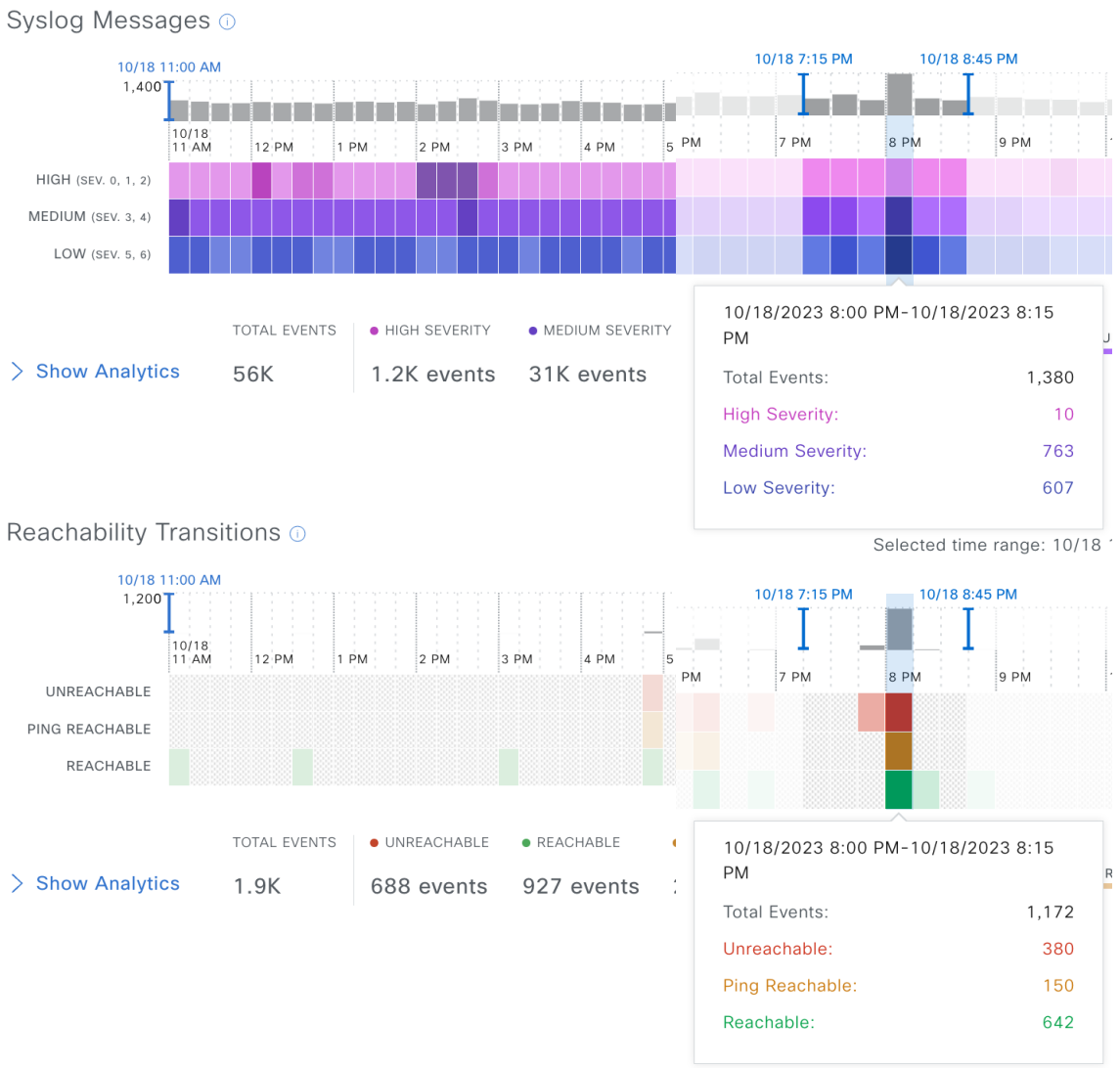

DNA Center
Assurance / Dashboards / Issues and Events
Zdenek
Issues
Events
Event Analytics - Preview
Global/Prague/PRG07
24 Hours
11:30a
Router
Switch
Wireless Controller
AP
Third Party Device
Wired Endpoints
Wireless Endpoints
Events (20)
Category Type
Devices
Endpoints
Wired
Filter Table
0 Selected
Event Name
Status
Authentication Started
Authorized Success
Authorization Success
Authentication Started
Authorization Failed
Authentication Started
Authorization Failed ERROR
Nov 28, 2023 12:23:10.725 PM
Identifier
00-50-56-B7-66-2B
Additional Info
TDL | Connected Device: C9300-E2.enprglab.local | Connected Interface: GigabitEthernet1/0/2
Severity
Error
Event Type
TDL
Message Text
Client Authentication failed (DOT1X)
Mnemonic
FAILED
Facility
AUTHC
Connected Device Name
C9300-E2.enprglab.local
Location
Global/Prague/PRG07
Audit Session Id
2E65A8C00000000F0BA3F708
Connected Interface
GigabitEthernet1/0/2
Failure Reason
Client not capable of dot1x OR Client has not responded to webauth redirect page
Connected Device Events
±15 mins
Nov 28, 2023 12:08 PM - 12:38 PM
Switch: C9300-E2.enprglab.local
±15 mins
±30 mins
±45 mins
±1 hr
Export
Filter Table
Event Name
Status
Severity
Timestamp
Event Type
Device IP
RBM:SGACLHIT
Info
Nov 28, 2023 12:38:10.349 PM
Syslog
192.168.101.46
RBM:SGACLHIT
Info
Nov 28, 2023 12:38:10.349 PM
Syslog
192.168.101.46

Catalyst Center – Issues, Events

Event Analytics from 2.3.7

- Event Analytics aggregates and processes event data, extracting relevant metrics and generating insightful analytics.
- Intuitively navigate from millions of events to specific sites, devices or events of interest
- Correlate & compare trends & patterns across events & network domains



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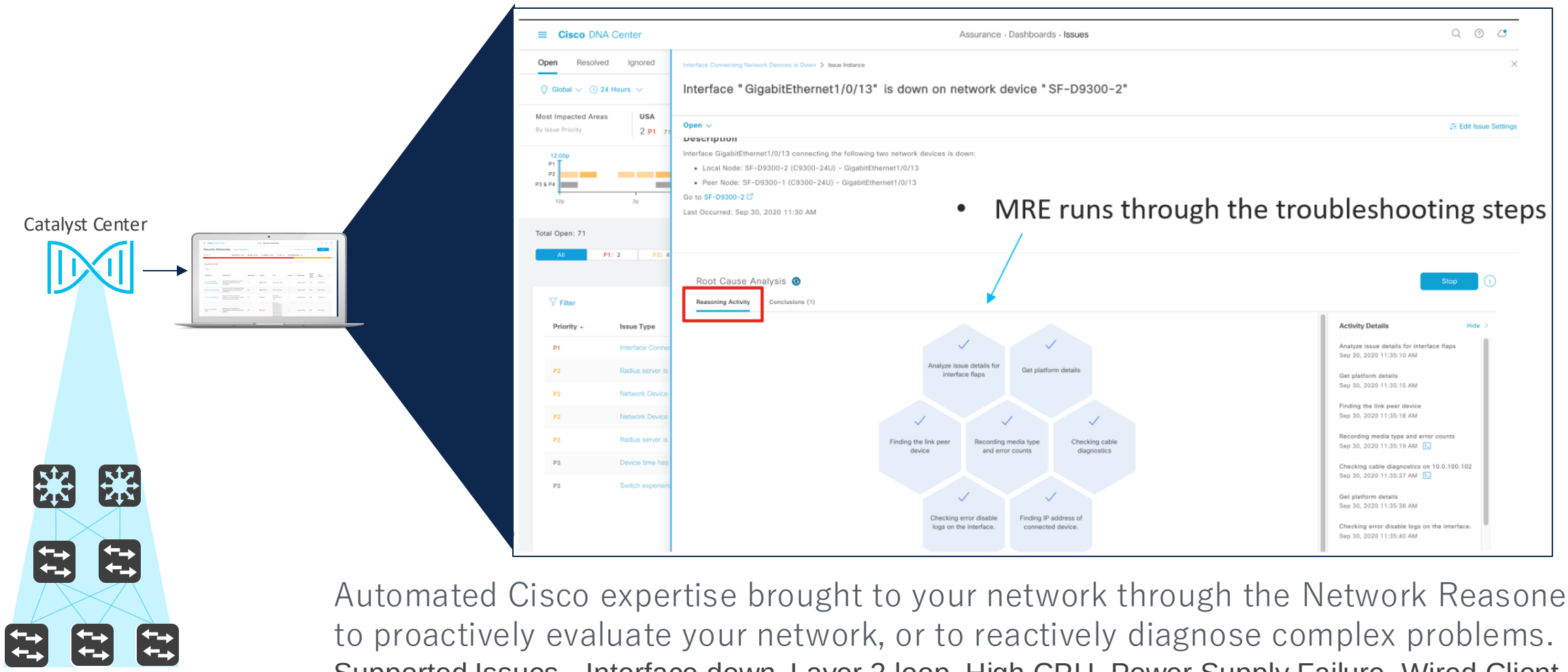
Catalyst Center – Network Reasoner / Machine Reasoning Engine (MRE)



Automated Cisco expertise brought to your network through the Network Reasoner to proactively evaluate your network, or to reactively diagnose complex problems.

Supported Issues - Interface down, Layer 2 loop, High CPU, Power Supply Failure, Wired Client Authentication Failure due to MAB/802.1x, Client DHCP reachability issue, PoE device flagged faulty

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Issues | Events

Most Impacted Areas by Issue

San Jose
437 P1 | 2285 Open

All | P1: 490 | P2

Total Open: 2571

Search Table

Priority	Issue Type
P1	Fabric Devices (
P1	WLC unreachab
P1	Fabric Devices (
P1	Switch unreacha
P1	Fabric Devices (
P1	Fabric Devices (
P1	TCAM Utilizatio
P1	Fabric WLC to M
P1	Interface Conne
P1	Layer 2 loop sy

46 Records

Layer 2 loop symptoms / Issue Instance

P1 Host flaps observed in 1 VLAN(s)

Status:

Issue Profile: global | Edit Issue Settings

Device	SFO13-D9300-1
Role	DISTRIBUTION
Time	Dec 6, 2023 11:47 AM
Location	Global/North America/USA/California/San Francisco/SFO13
Potential Root Cause	MAC_FLAPPING

INITIAL ASSESSMENT

1 VLANs in the Potential Loop

3 Ports in the Potential Loop

Problem Details

Root Cause Analysis MRE

Root Cause Analysis | View All Network Reasoner Tools

Last Run By User: Dec 6, 2023 11:47 AM

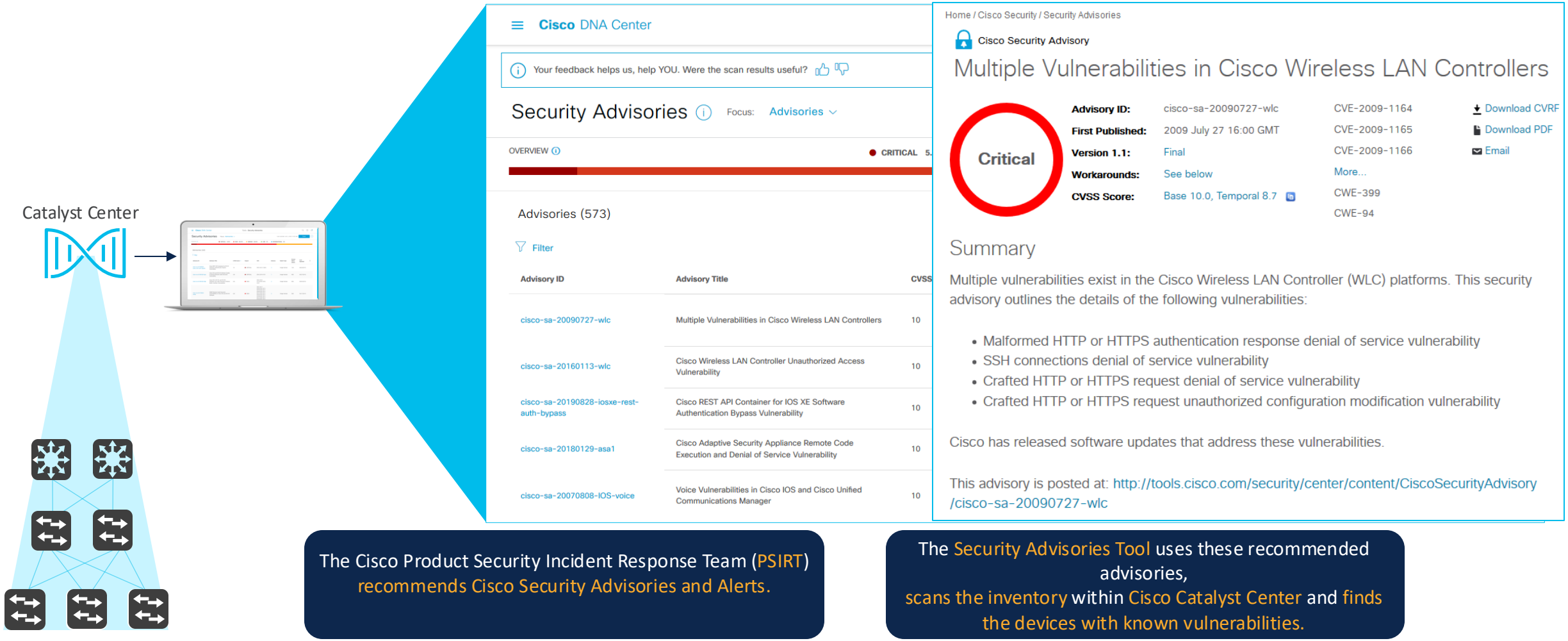
Run Again

Reasoning Activity | Conclusions (1)

Loop detected on VLAN 31.

Index	VLAN	Device Id	Device	Port
0	31	a977ab34-2b6d-442e-880c-ff09c3971ba8	SFO13-D9300-1	GigabitEthernet1/0/13
1	31	057165c6-6e44-4eba-a181-952afa4fca46	SFO13-D9300-2	GigabitEthernet1/0/13
2	31	057165c6-6e44-4eba-a181-952afa4fca46	SFO13-D9300-2	GigabitEthernet1/0/24
3	31	21bd59ac-deaf-4ee8-a078-dae04d1655c0	SFO13-A3850-1	GigabitEthernet1/0/24
4	31	21bd59ac-deaf-4ee8-a078-dae04d1655c0	SF013-A3850-1	GigabitEthernet1/0/23

Catalyst Center - Security Advisories / Machine Reasoning Engine (MRE)



The Cisco Product Security Incident Response Team (PSIRT) recommends Cisco Security Advisories and Alerts.

The Security Advisories Tool uses these recommended advisories, scans the inventory within Cisco Catalyst Center and finds the devices with known vulnerabilities.

Some of the presented features available within CX Cloud Service contract

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Problém č. 6: „Hele ty pobočky jsou nějaké divné. Nechceš tam zajet a ověřit to?”

Image generated by AI

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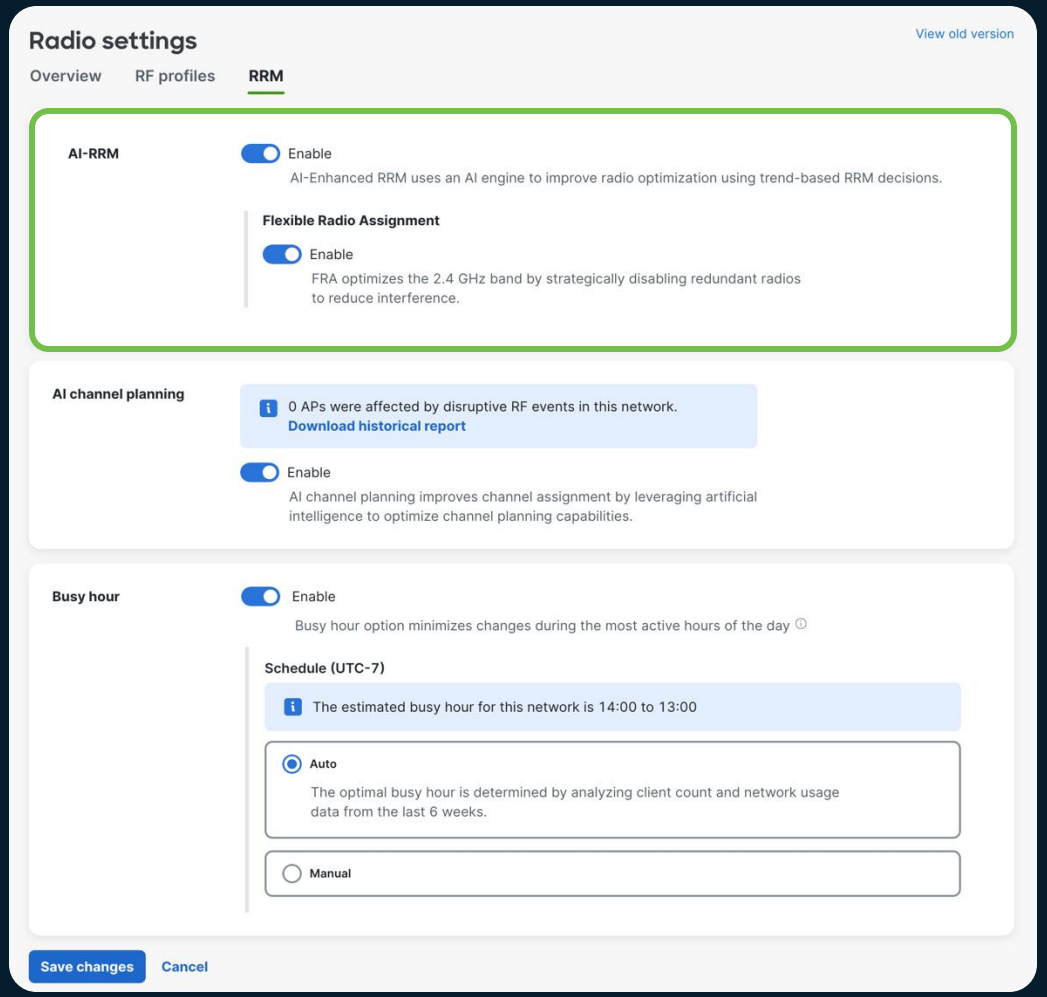
Let’s configure AI-RRM



- Wireless > Radio Settings > RRM
- AI-RRM option will upgrade traditional RF management into AI-Enhanced, Trend-based RRM
  - Transmit Power Control
  - Dynamic Channel Assignment
  - Dynamic Bandwidth Allocation
  - Flexible Radio Assignment option became available on AI-RRM
  - Busy Hour and AI Channel Planning continue to work with AI-RRM engine

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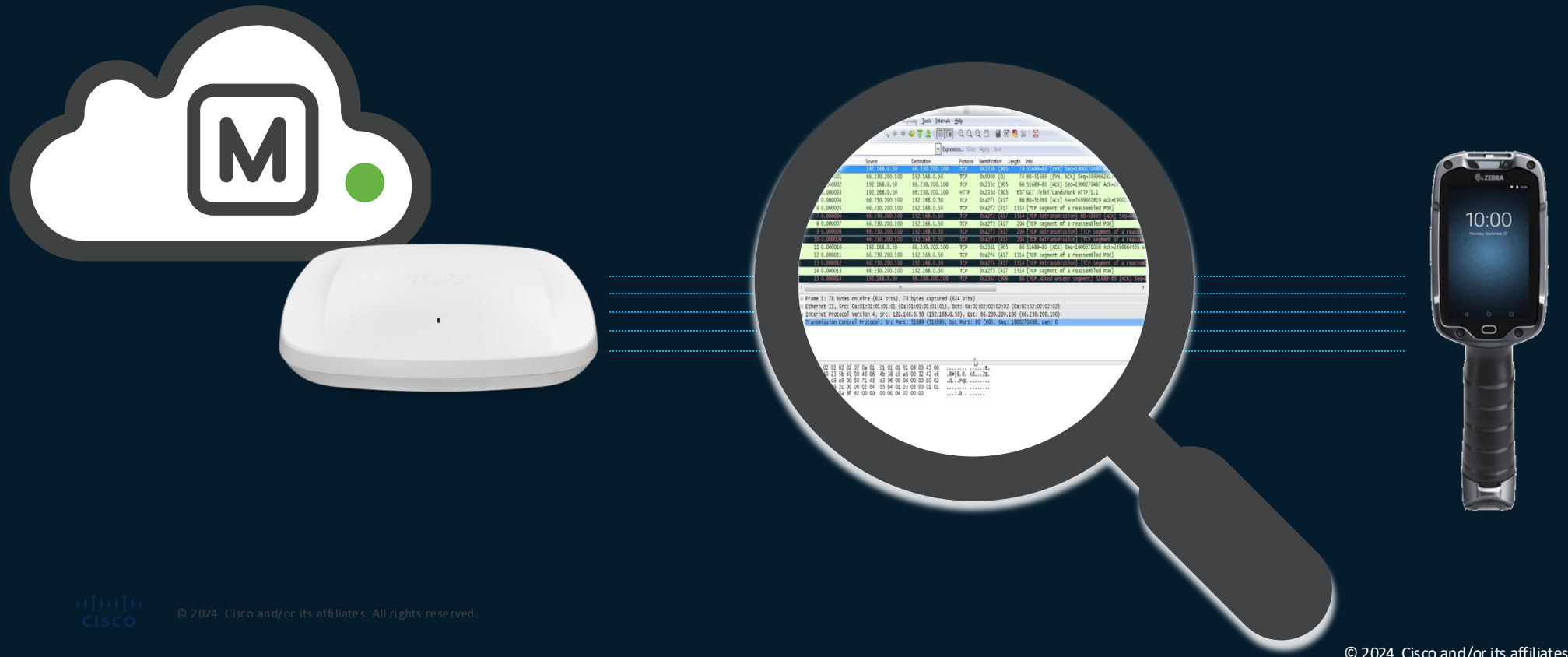
Let’s Investigate!

Today, dashboard can be used to manually capture live network traffic to diagnose network connection issues related to client roaming or association failures with APs.



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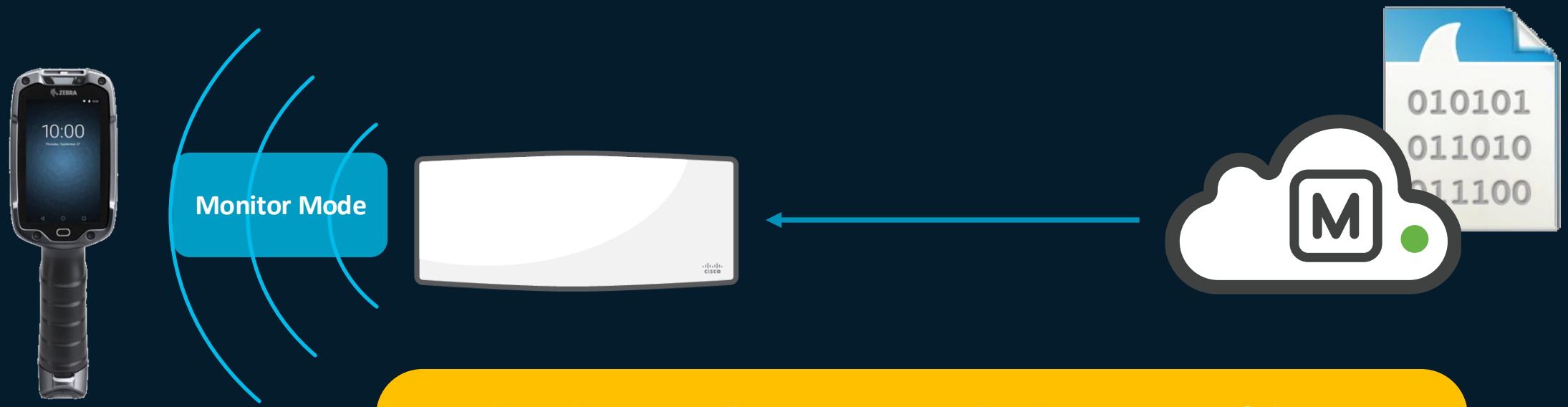
AI Packet Capture



1. Dashboard automatically initiates PCAP with a client association failure

2. PCAP files stored in dashboard to correlate with connection failure

3. Integrated Packet Analyzer for Root Cause Analysis

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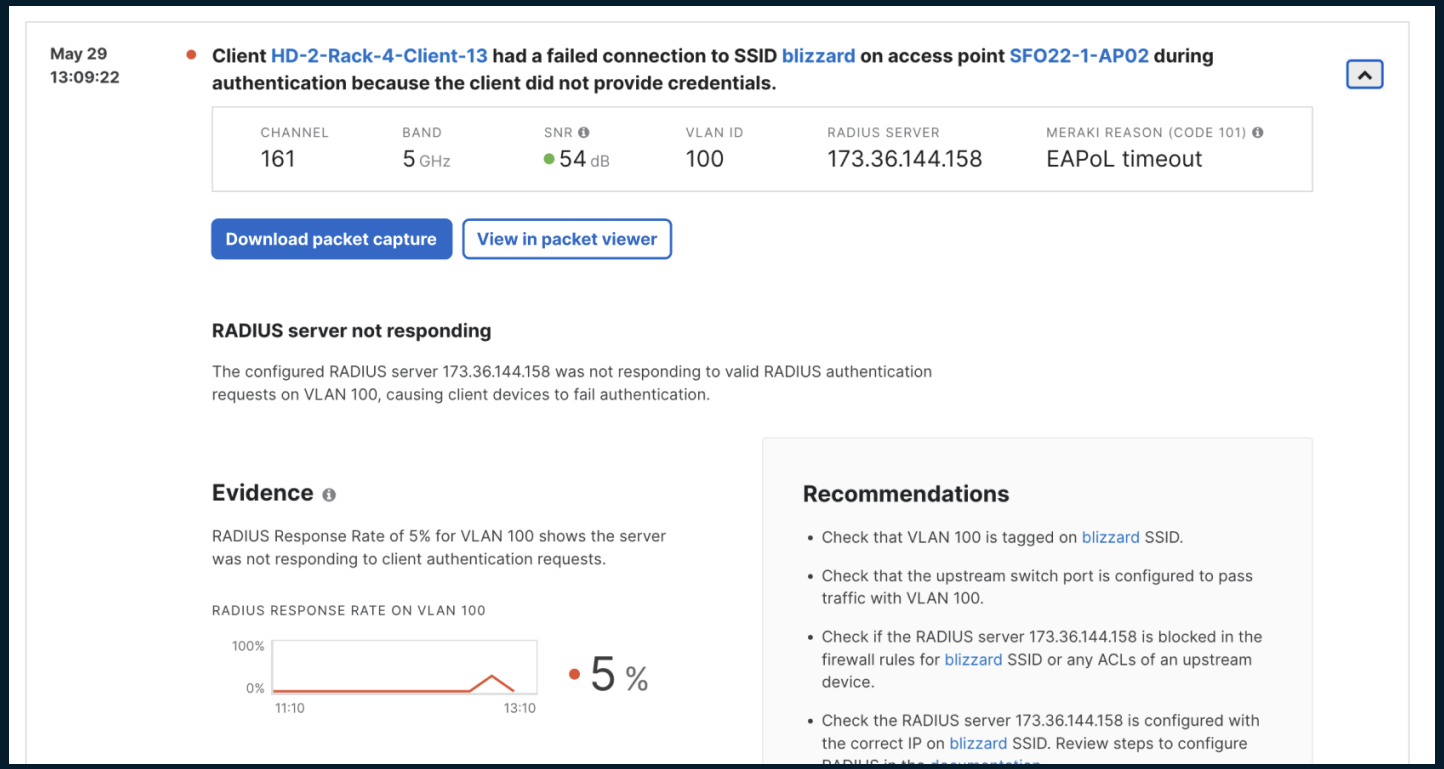
PCAP + Root Cause Analysis

Correlate automatic packet capture with root cause analysis in the client connection timeline.



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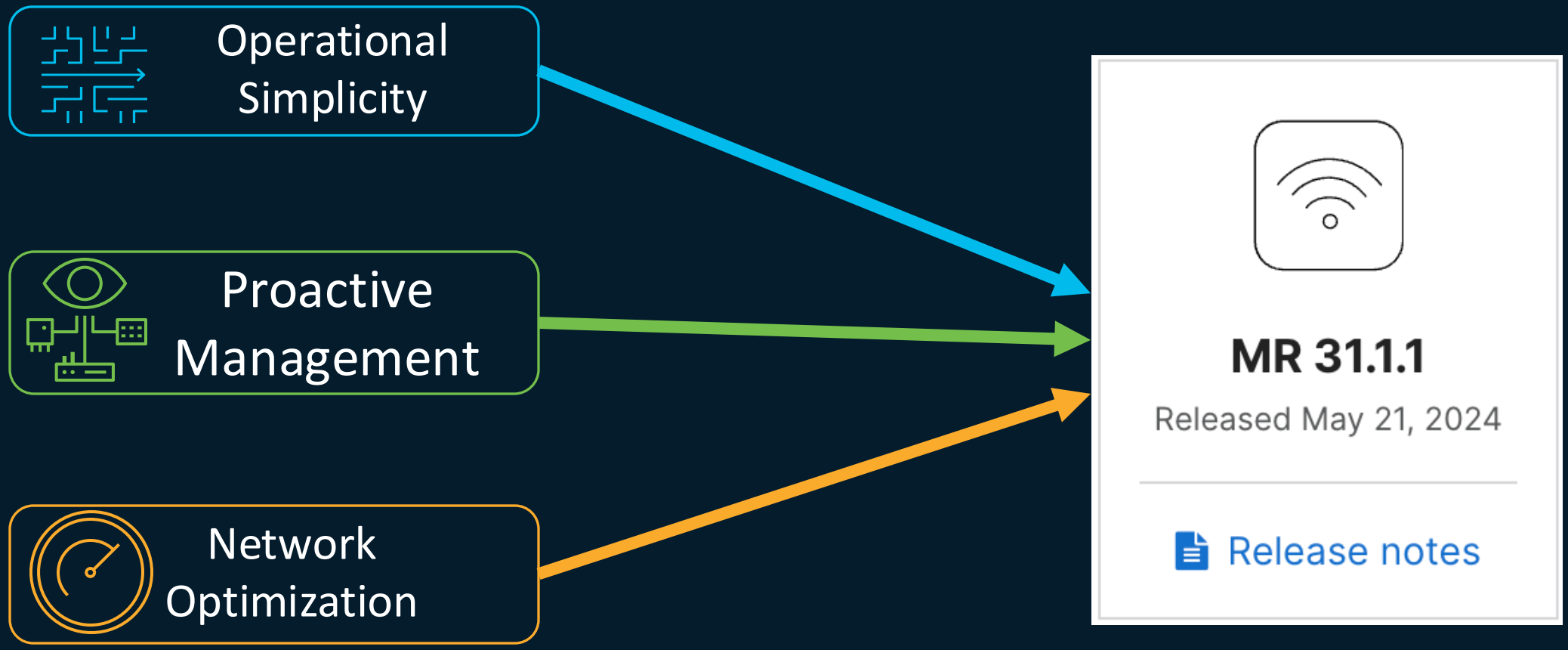
Upgrade to MR31.1.1 firmware to simplify operations and improve your network's performance using the latest AI tools!



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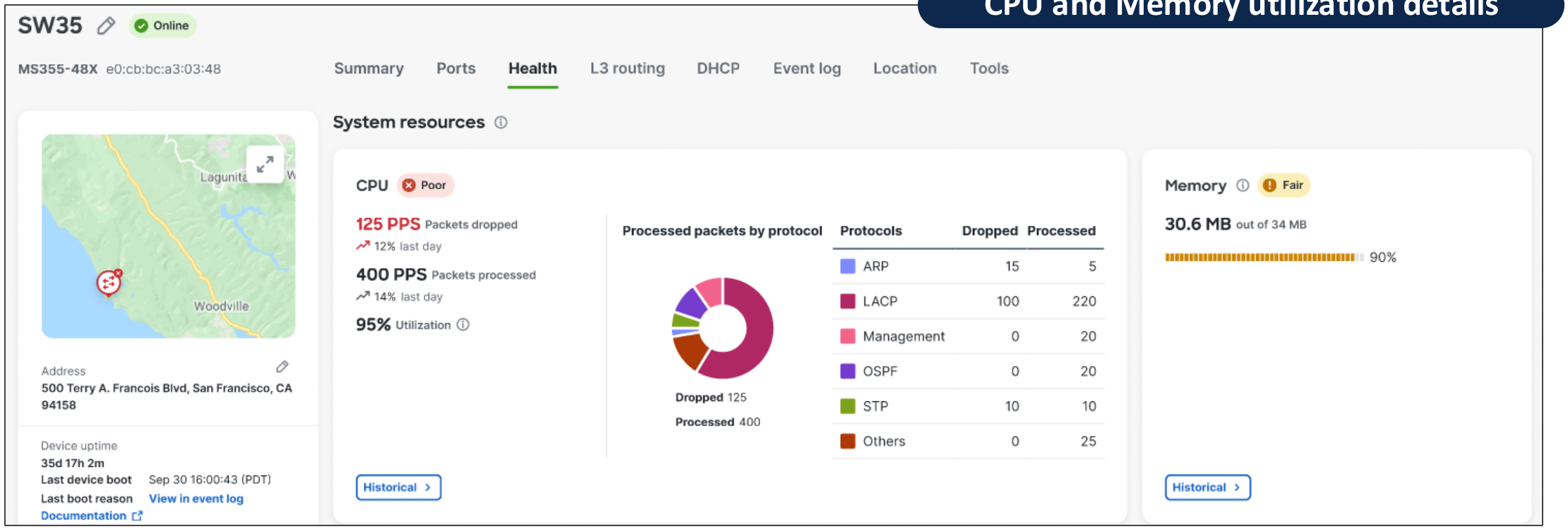
MS Device Health

Coming Soon

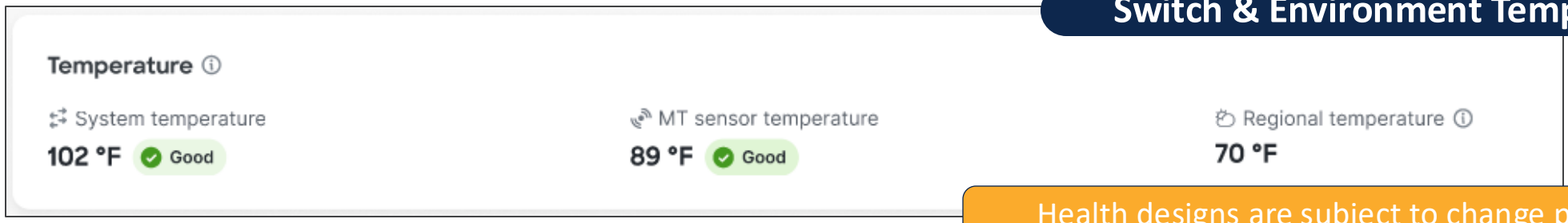
MS17

Visibility into switch health metrics

CPU and Memory utilization details



Switch & Environment Temperature



Health designs are subject to change prior to release

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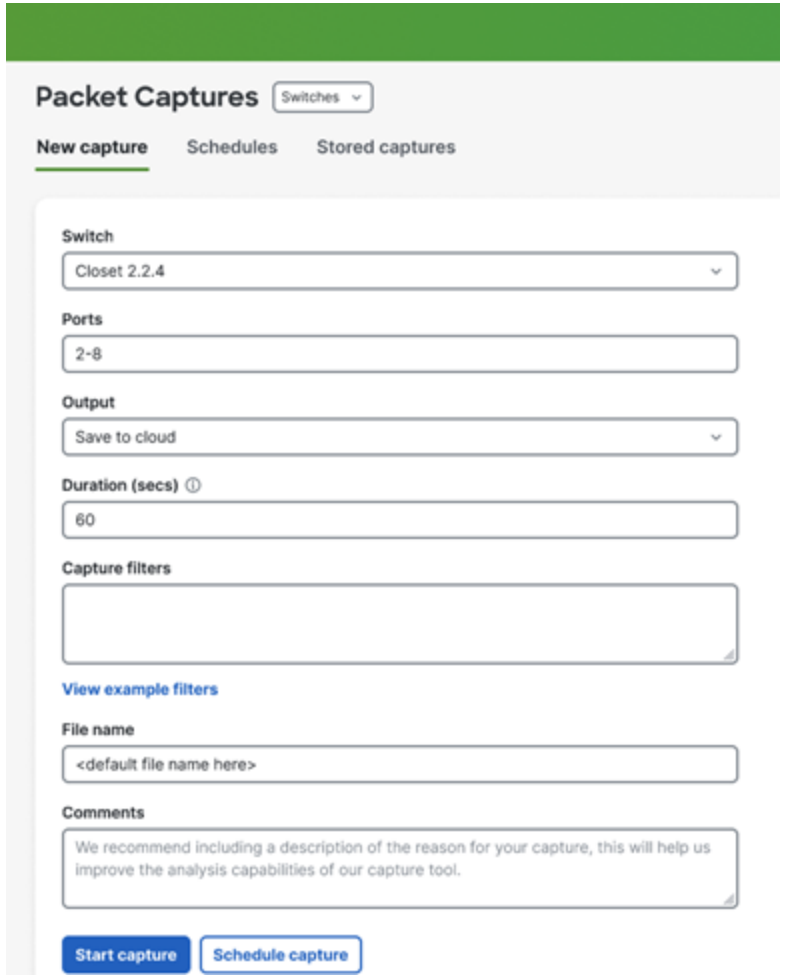
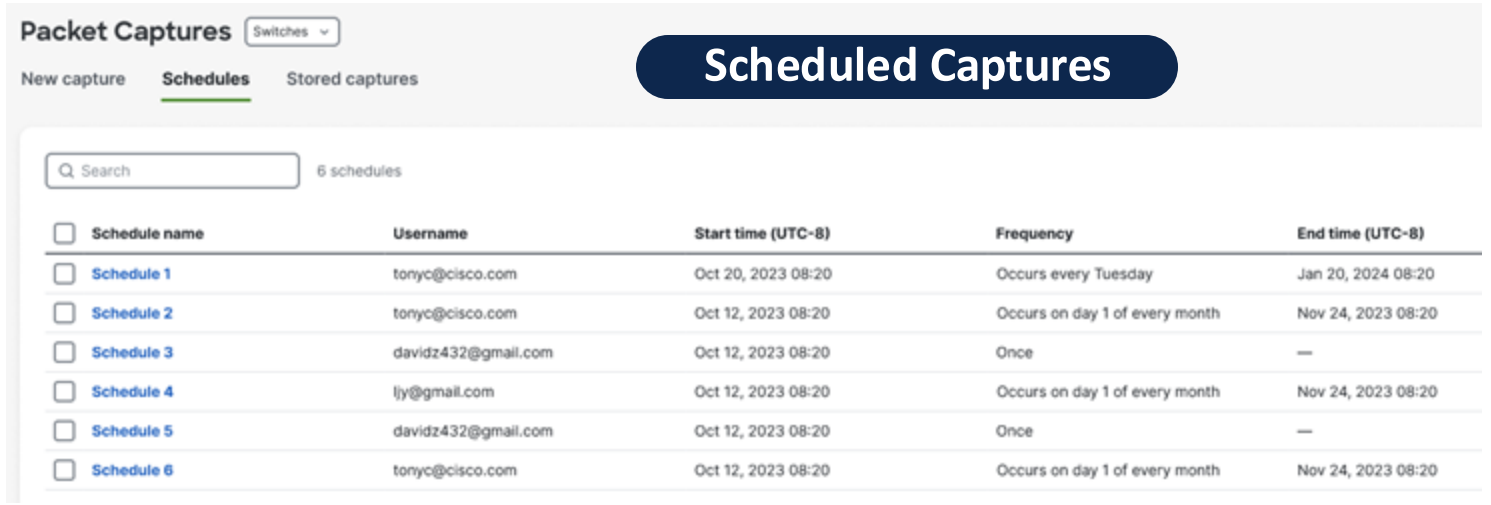
Cloud PCAP

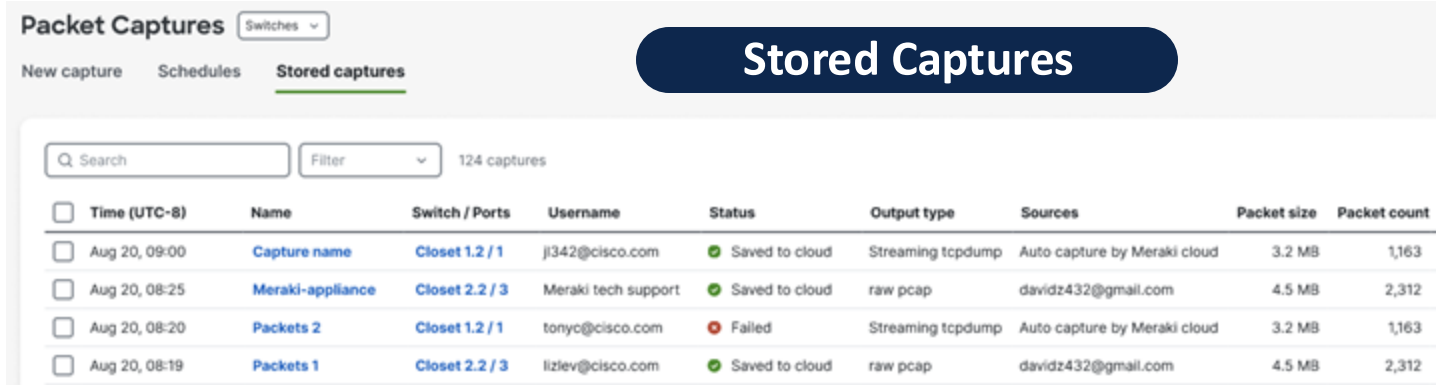
Coming Soon

MS17

Streamlined packet captures with a cloud-hosted option







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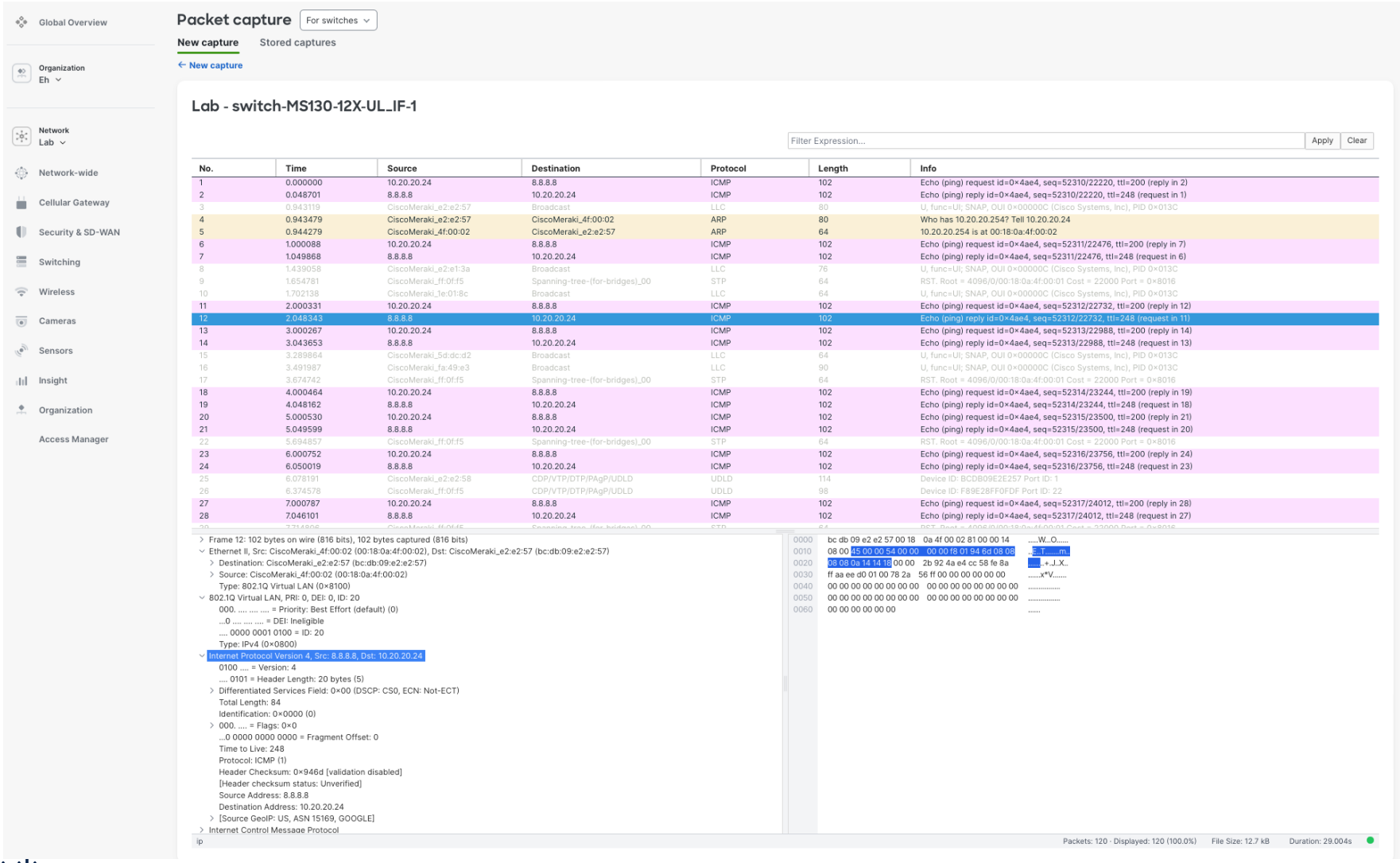
Cloud Packet Analysis

Coming Soon

MS17



Squint!

Then let's check out a demo

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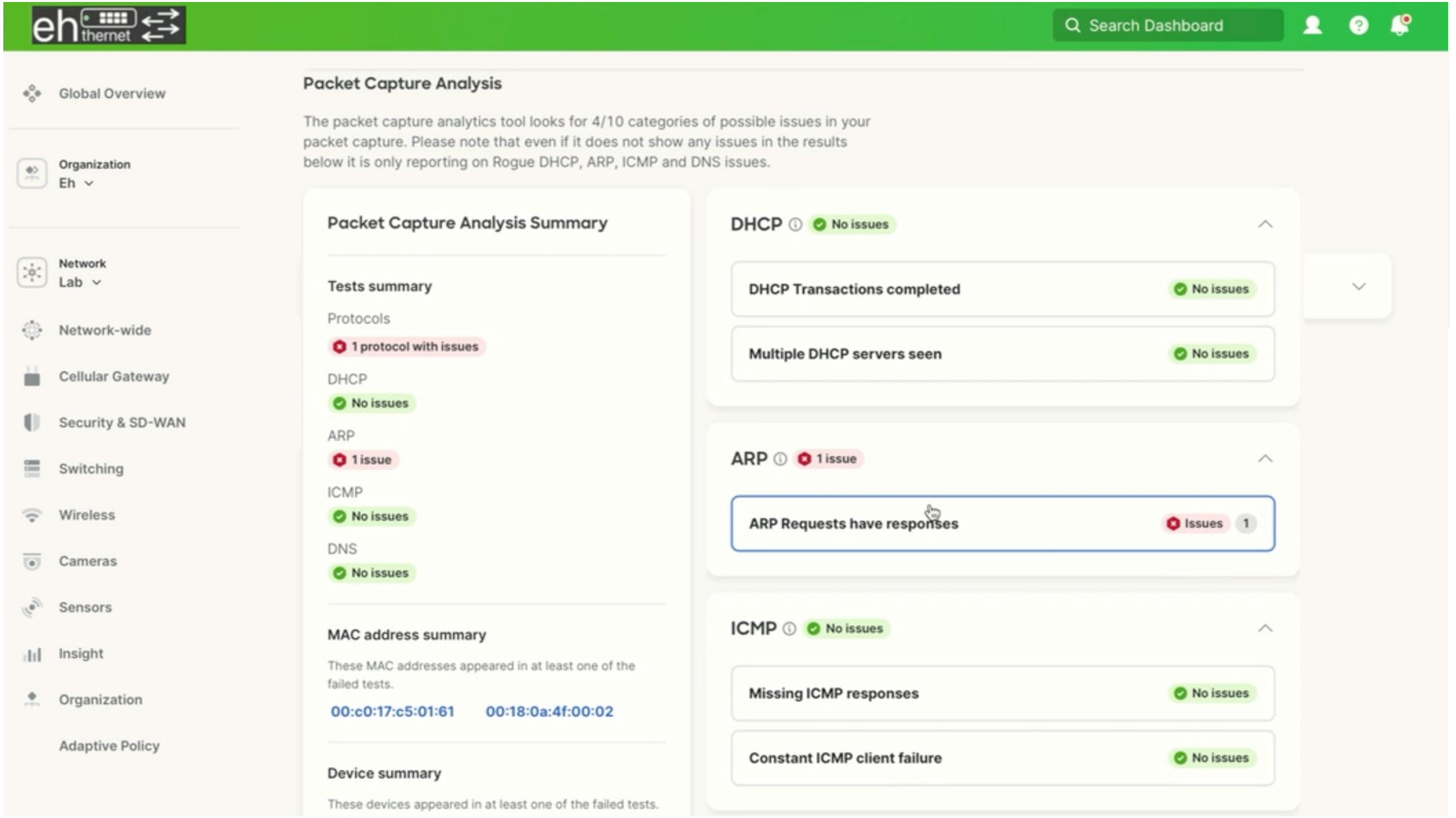

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Problém č. 7: „Dostaneme přidáno! Máme otevřít novou divizi, ale je potřeba ji držet odděleně.”

Image generated by AI

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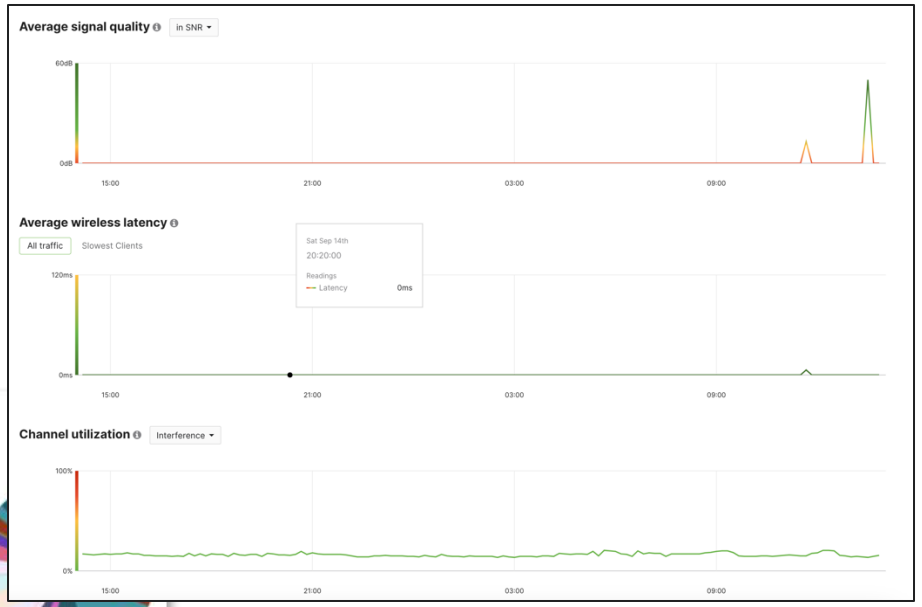
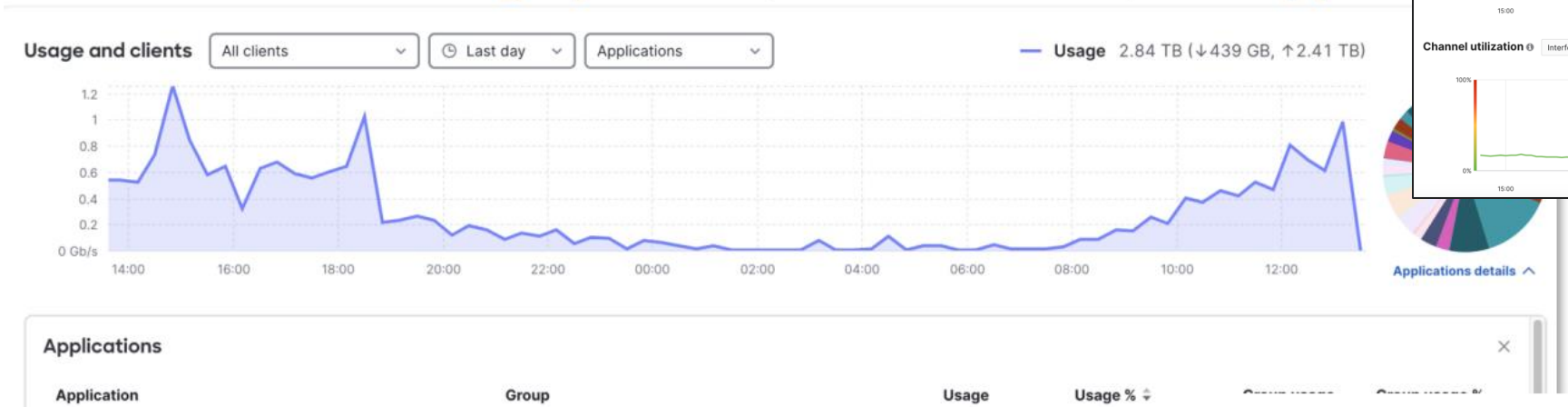
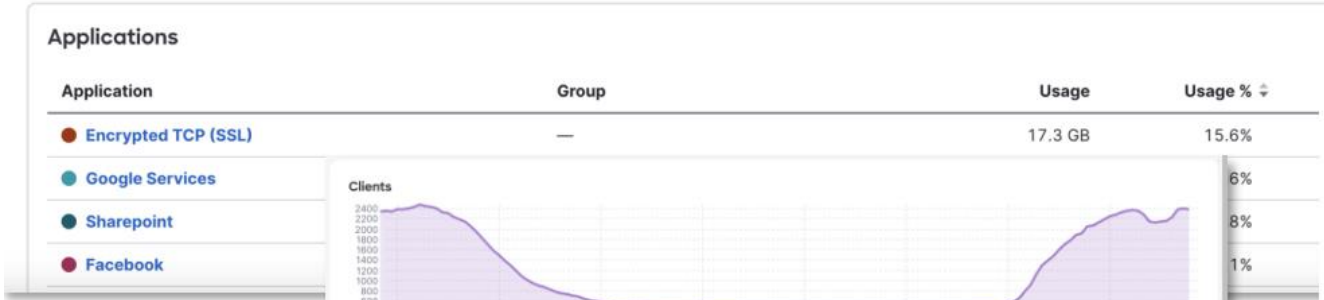
Network Performance



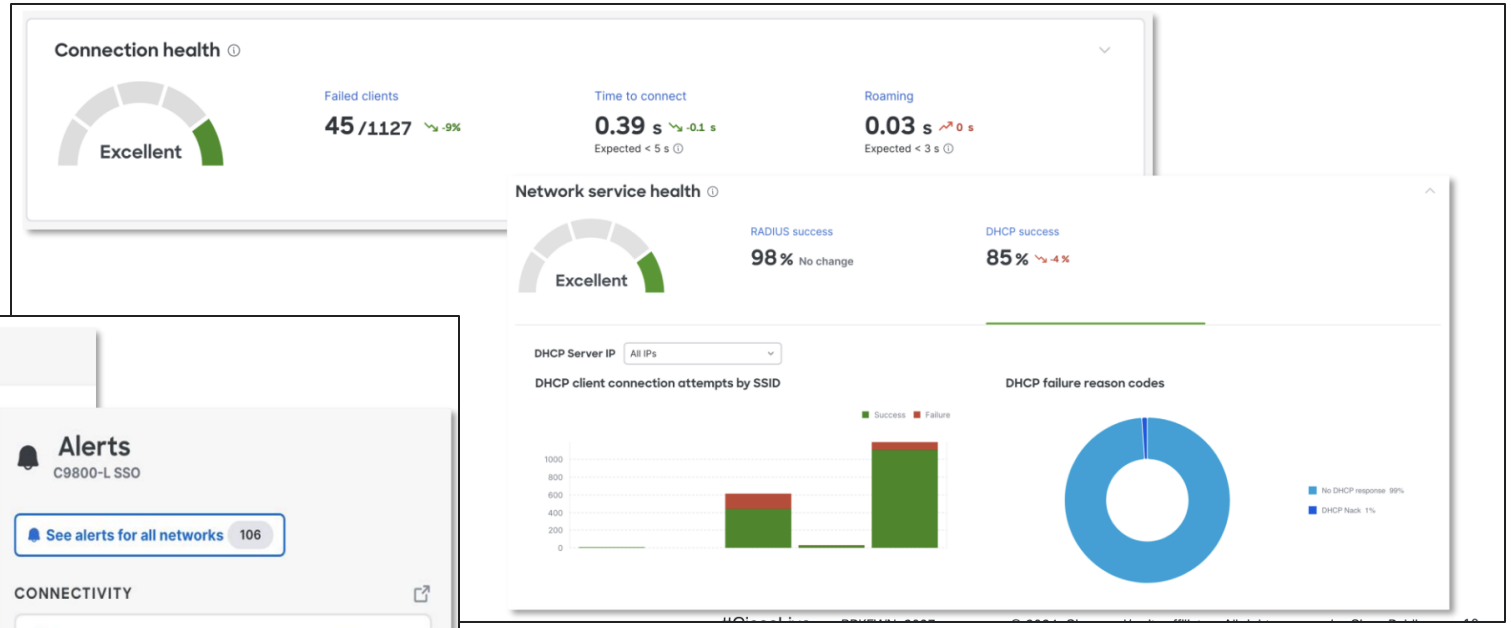


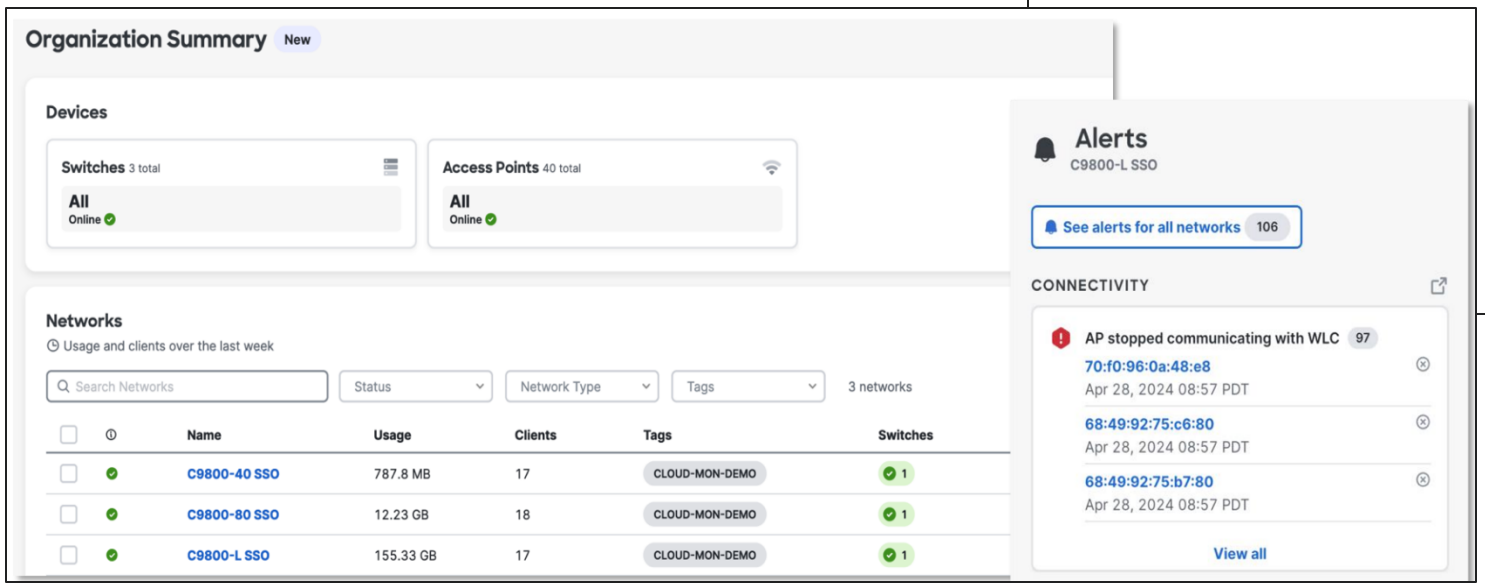


Top devices

Name	Model	# Clients	Usage	% Usage
SJC23-32A-AP19	C9136	127	262.43 GB	8.57%
SJC23-32A-AP37	CW9166I	72	108.81 GB	3.55%

Health Information





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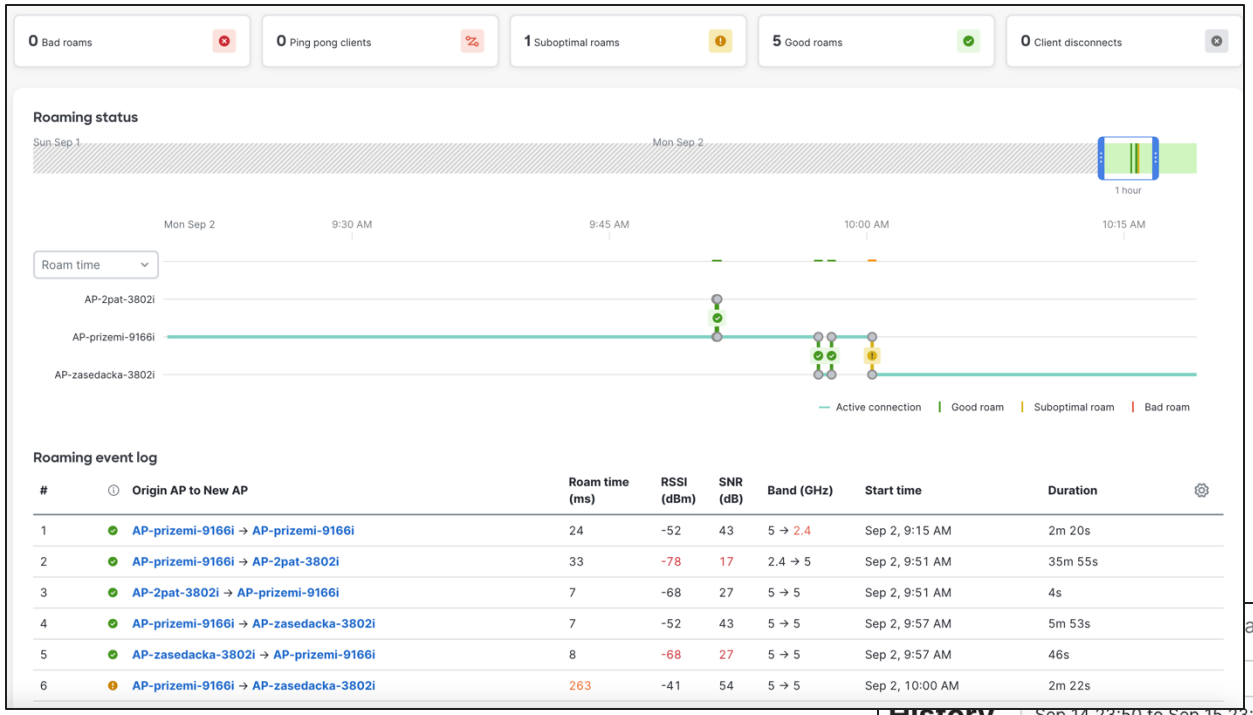
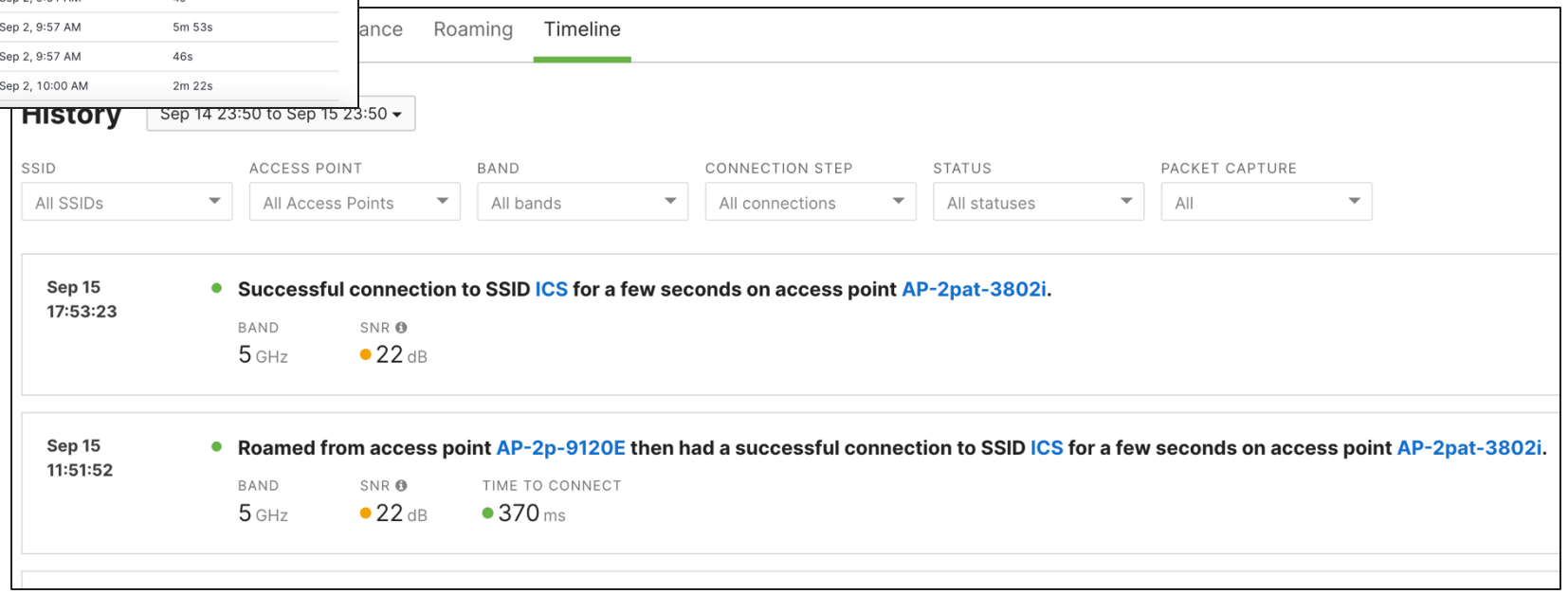
Great News – Roaming Analytics



#	Origin AP to New AP	Roam time (ms)	RSSI (dBm)	SNR (dB)	Band (GHz)	Start time	Duration
1	AP-prizemi-9166i → AP-prizemi-9166i	24	-52	43	5 → 2.4	Sep 2, 9:15 AM	2m 20s
2	AP-prizemi-9166i → AP-2pat-3802i	33	-78	17	2.4 → 5	Sep 2, 9:51 AM	35m 55s
3	AP-2pat-3802i → AP-prizemi-9166i	7	-68	27	5 → 5	Sep 2, 9:51 AM	4s
4	AP-prizemi-9166i → AP-zasedacka-3802i	7	-52	43	5 → 5	Sep 2, 9:57 AM	5m 53s
5	AP-zasedacka-3802i → AP-prizemi-9166i	8	-68	27	5 → 5	Sep 2, 9:57 AM	46s
6	AP-prizemi-9166i → AP-zasedacka-3802i	263	-41	54	5 → 5	Sep 2, 10:00 AM	2m 22s



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Wireless models supported at launch

C9800-80
C9800-40
C9800-L

6E

CW9166
CW9164
CW9163
CW9162

C9136

6

C9130
C9124
C9120

C9117
C9115
C9105

5

AP4800
AP3800
AP2800
AP1562

IOS XE 17.12.3 and higher
IOS XE 17.15.1 or later

9800-CL support end of CY24

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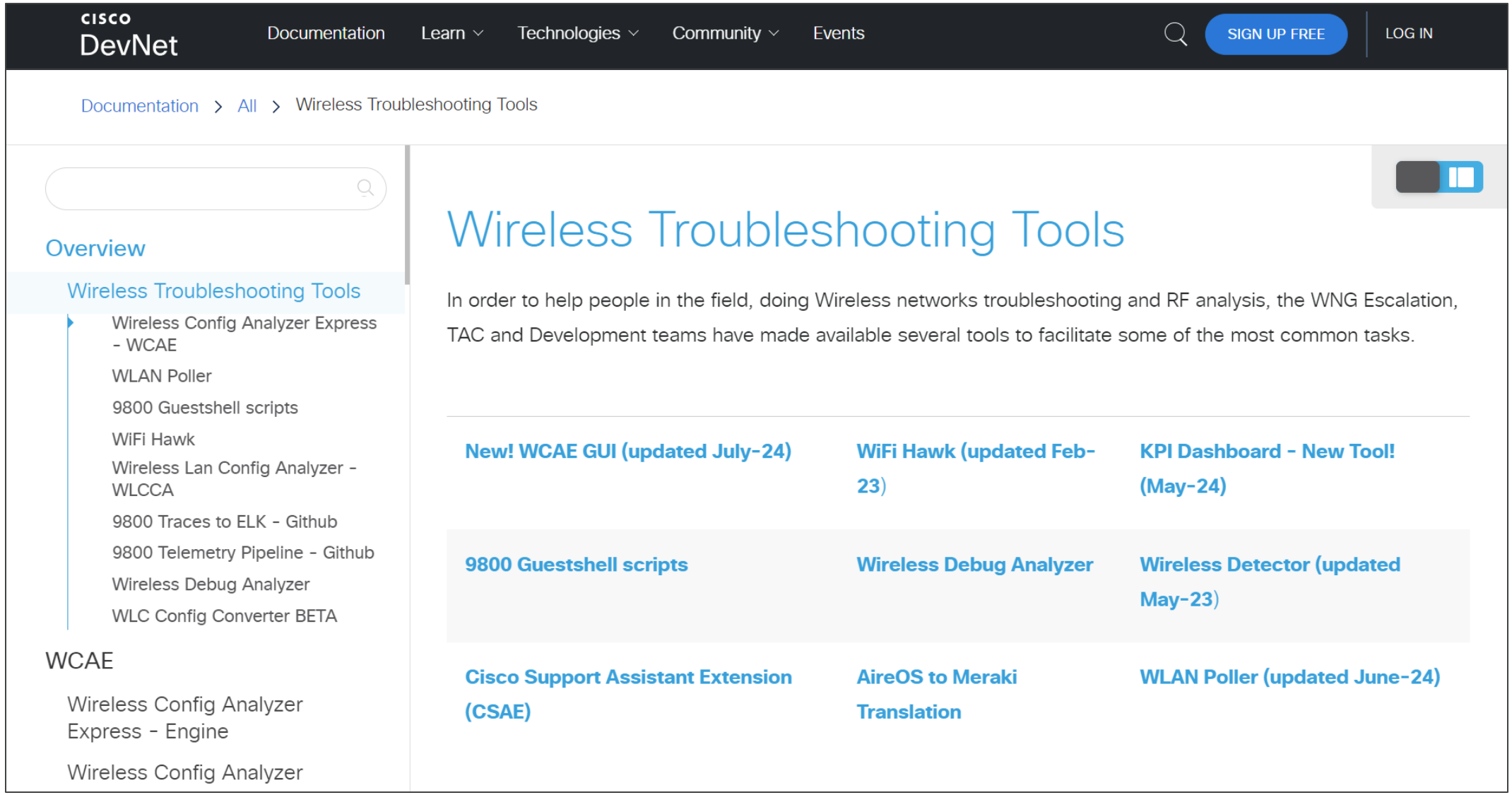
Cisco Wireless Troubleshooting Tools (DevNet)



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These are the currently supported platforms

Models

Catalyst
9200/L/CX
9300/L/LM/X
9500

Firmware

IOS-XE 17.3+

Licensing

Advantage
Essentials

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Problém č. 8: „Ty videohovory dneska nějak drhnou, ale já mam vše zelené”

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Most Correlated Visibility In One View

App Experience
- Transaction scripting, page load

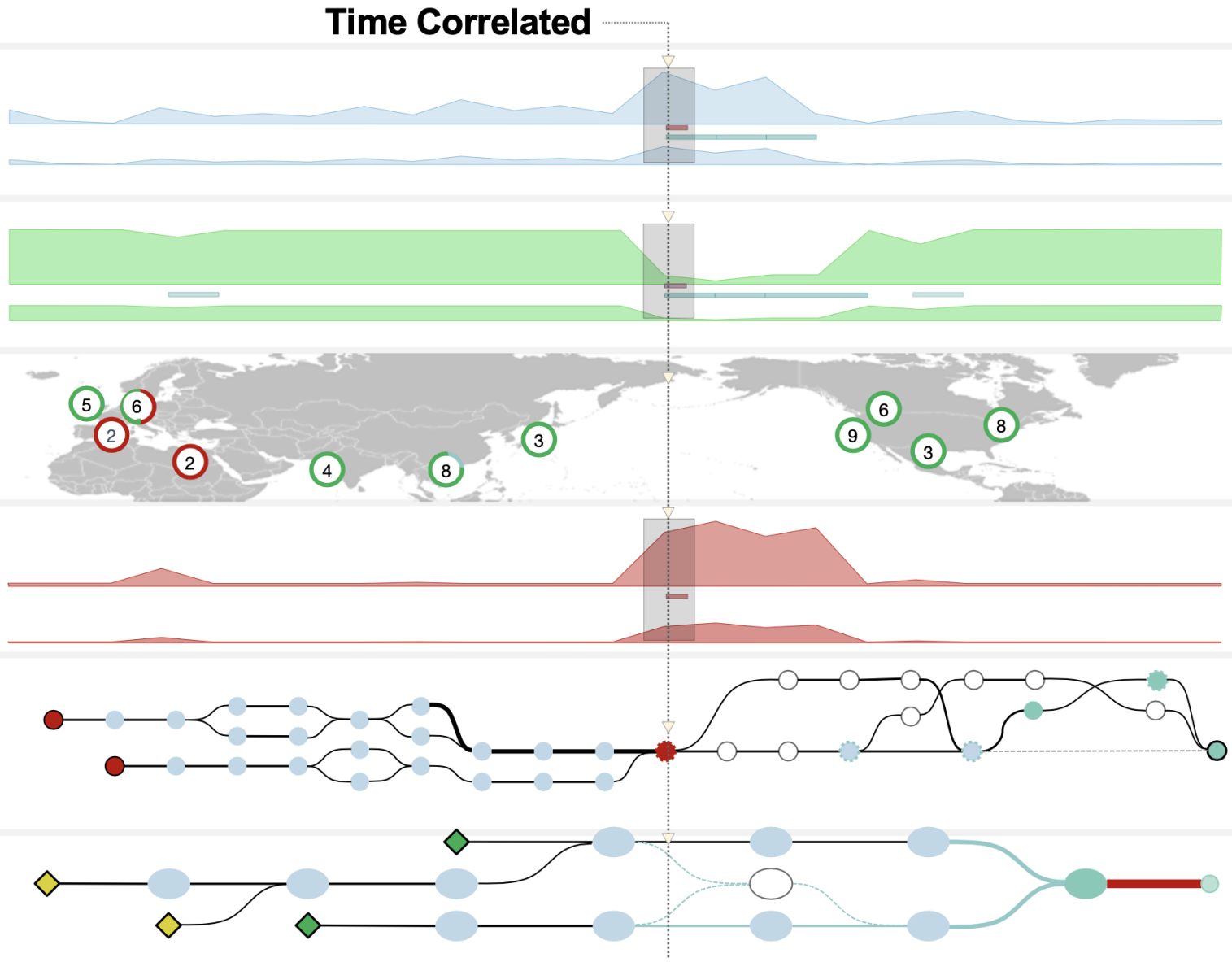
HTTP/DNS/RTP Server
- HTTP Availability, response time, throughput

Scope and Domain
- Geo, HTTP phase, errors

Network Metrics
- 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



cisco Meraki

How ThousandEyes Collects Data

Enterprise Agent

Lightweight agent deployed to customer sites and data center locations.

Cloud Agent

No installation required. 376 internet connected vantage points.

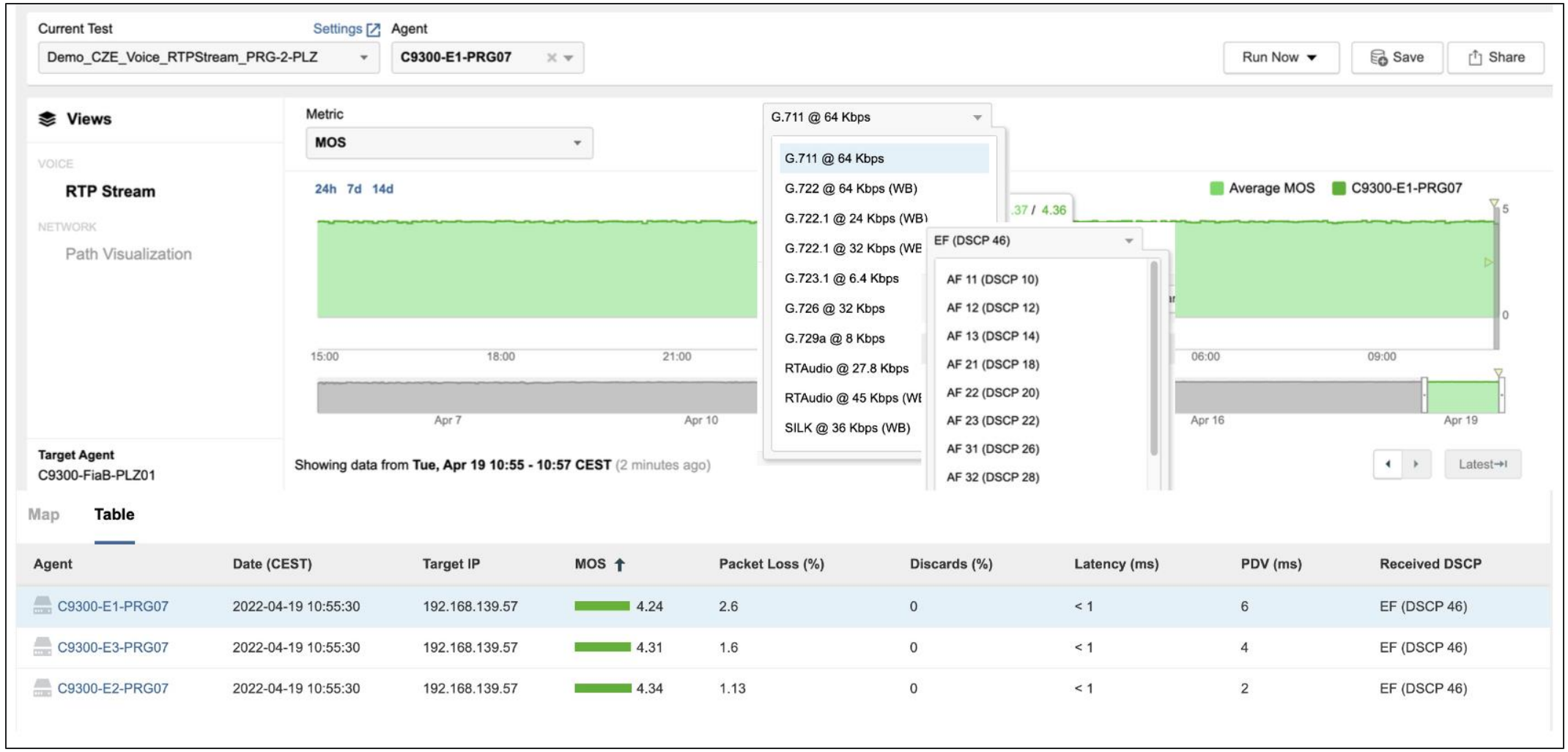
Endpoint Agent

Pushed to end user laptop or desktop for last mile visibility.

docker
vmware
ovf
Appliance
CISCO
Cisco IOS XE Open Service Containers
Microsoft Hyper-V
Powered by Linux
CISCO
Cisco Catalyst 9000 Series Switches
aws
Azure
Google Cloud

Windows
chrome

Syntetické hlasové volání



Agent	Date (CEST)	Target IP	MOS	Packet Loss (%)	Discards (%)	Latency (ms)	PDV (ms)	Received DSCP
C9300-E1-PRG07	2022-04-19 10:55:30	192.168.139.57	4.24	2.6	0	< 1	6	EF (DSCP 46)
C9300-E3-PRG07	2022-04-19 10:55:30	192.168.139.57	4.31	1.6	0	< 1	4	EF (DSCP 46)
C9300-E2-PRG07	2022-04-19 10:55:30	192.168.139.57	4.34	1.13	0	< 1	2	EF (DSCP 46)

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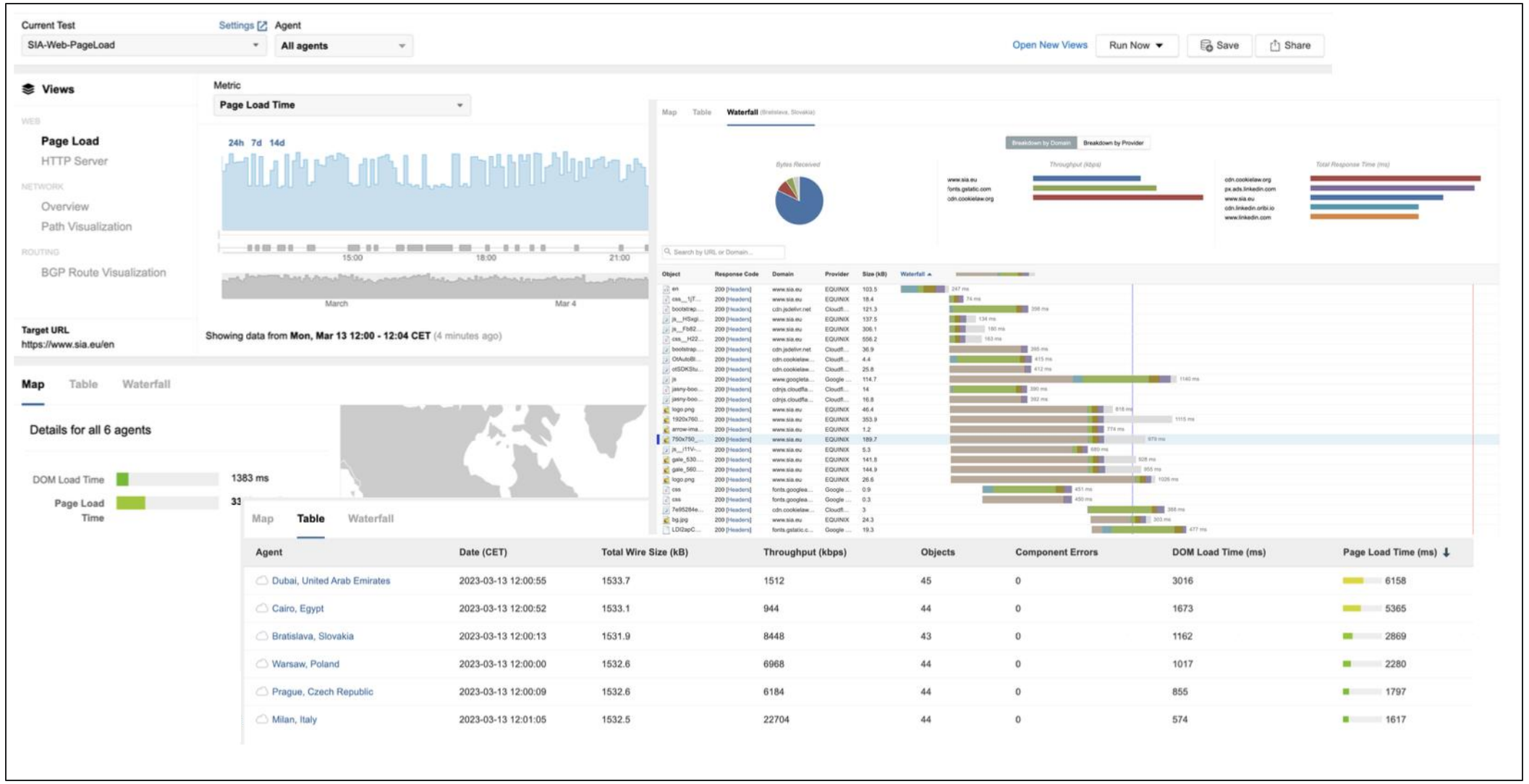
Page Load



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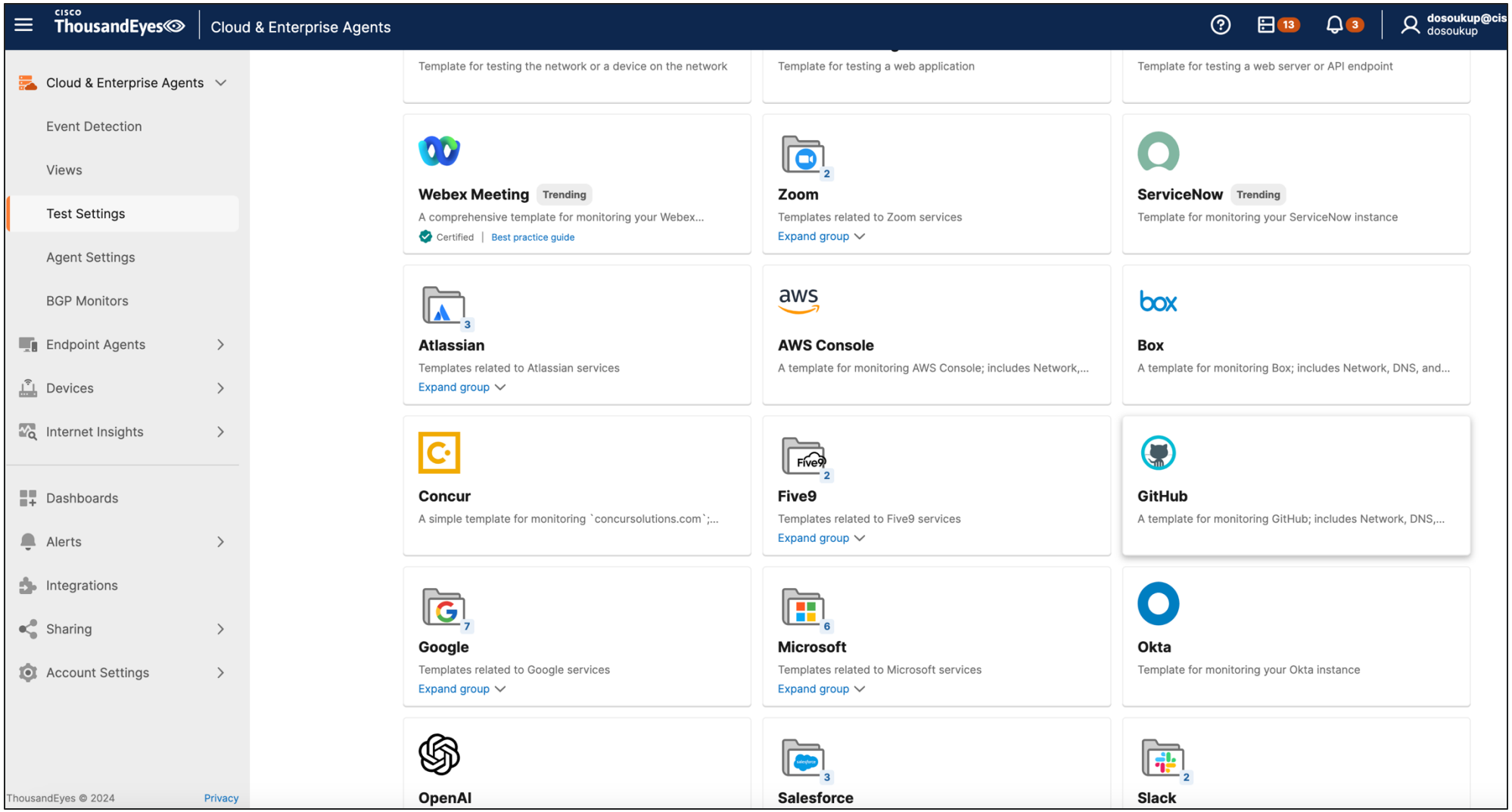
Test Templates



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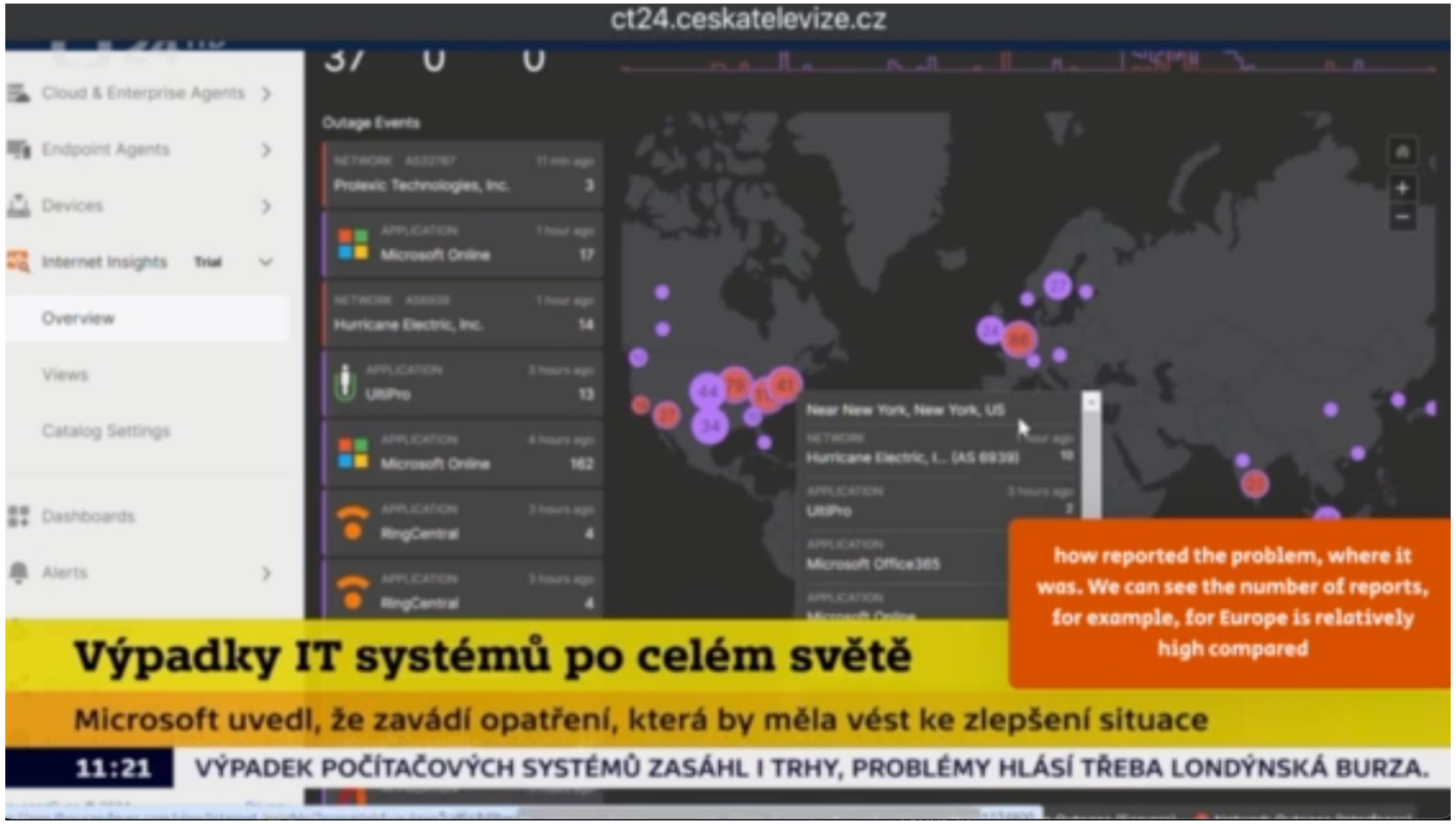
Publicly Known Analysis

- https://www.thousandeyes.com/blog/microsoft-outage-analysis-january-25-2023
- Crowdstrike:



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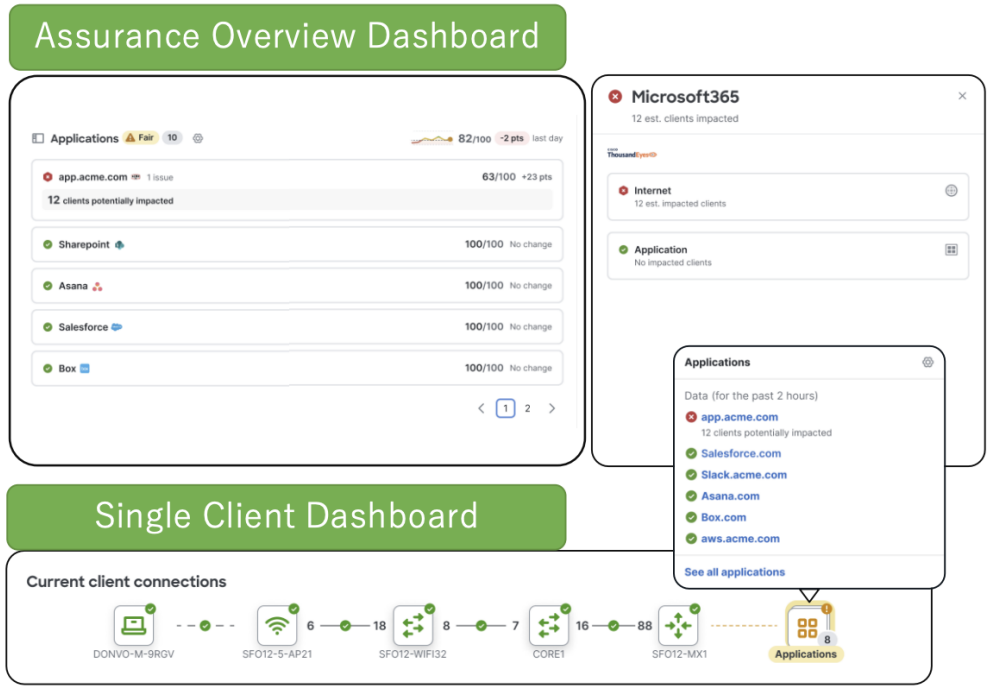
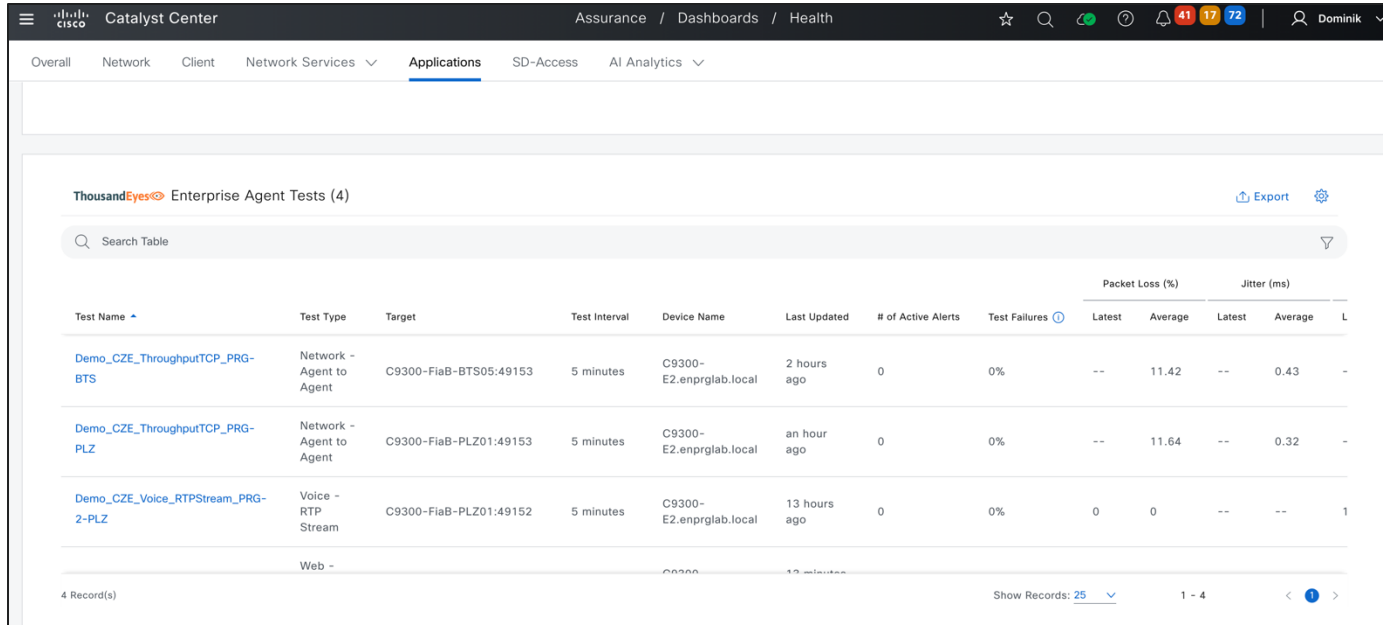
Integration

ThousandEyes Meraki Assurance Integration

- Per-Application Health with active probing
- Visibility beyond the WAN
- Differentiate internet or application server issue
- Integration with both network & single-client workflows





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AI Assistant

Conversational Interface Leading the way with Cisco Unified AIOps

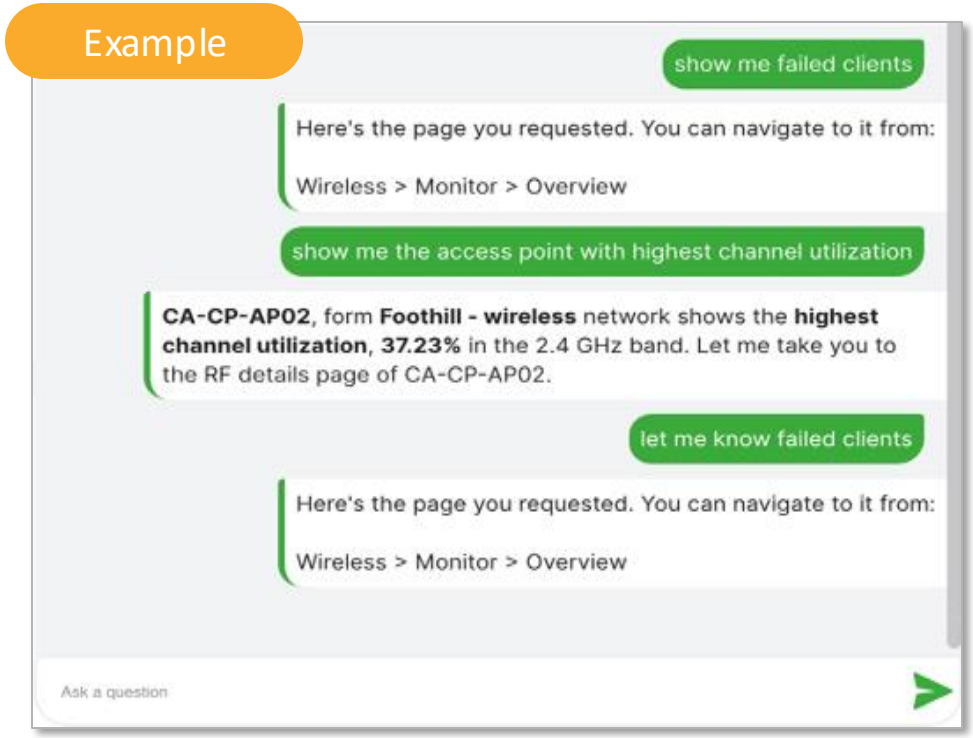
Background Conversational UI is replacing CLI and GUI search

Use Case Level 1 Network Support Engineer, e.g., Responsible for monitoring and first responder to incidents and reporting (Lacks domain expertise)

AI Driven Conversational Interface

- Proactive - Summarize and Highlight the Network Problems upfront
- Guided, Suggested Intents listing
- Network Expert System – LLM that integrated with Cisco/Meraki Extension using RAG
- Extensible – Can Learn a new intent and tasks
- Multi-domain Ready – Combine multiple domains
- Task-Oriented - Each Intent to accomplish specific tasks
- Unified AIOps - Support both Meraki Dashboard and Catalyst Center Customers

Example



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Problém č.X: „Posílají nám zase nějaké peníze na vylepšení kanceláře. Co s tím budeme dělat?„

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Cisco Spaces

Partner App Center

IBM TRIRIGA
Space Optimization

servicenow
Contact Tracing

salesforce

MazeMap
Meeting Room Finder

IBM

Pointr
Wayfinding

sas

SAP

molex
*Occupancy**

Azure

Enterprise systems and data lakes

STANLEY
Contact Tracing
And more

aws

Safety, Compliance &COVID Apps

Space Utilization

Behavior Analytics

Contactless People Experience

Operational Efficiency

Outcomes

Firehose API

Dashboard+Apps

DNA Spaces Cloud

Dynamic Gateway

Spaces Connector

IoT Device Marketplace

*Lighting Sensor**

*PoE Sensors**

Environmental Sensors (wired+ wireless)

Asset Tags

PIR Sensors

Wristband Tags

Card Tags

And more

Catalyst 9K
Switches

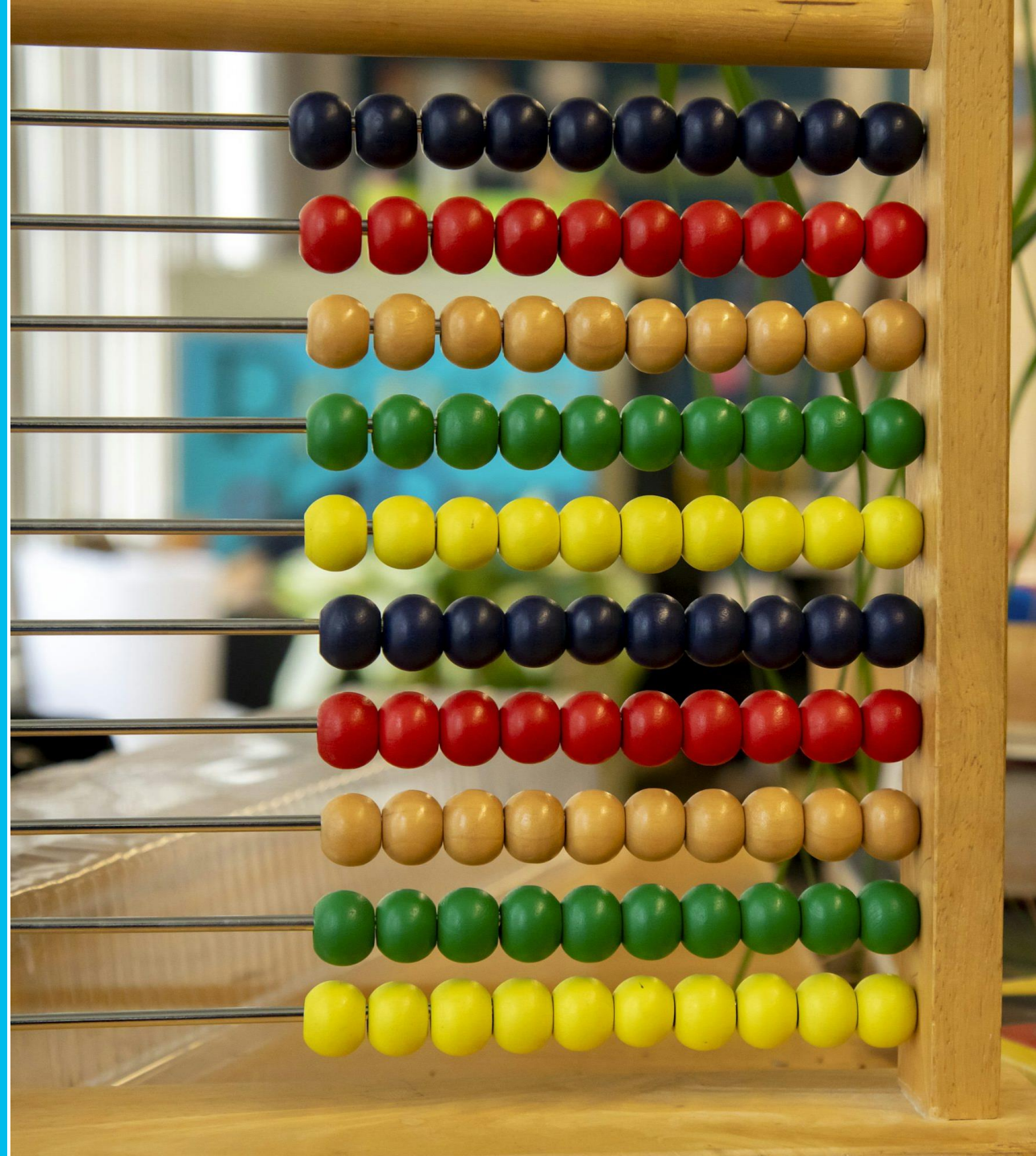
Catalyst 9K
Access Points

Meraki
APs

WebEx
devices

MV
cameras

Využití kanceláří



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Jaké jsou možnosti?

Building
Floor
Zone

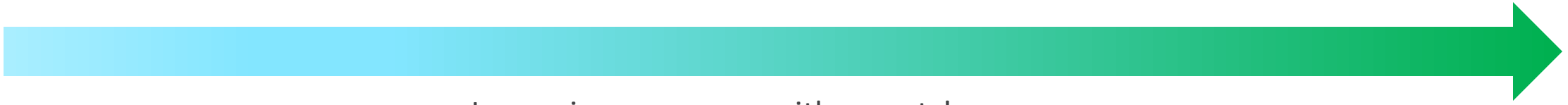
Building
Floor
Zone
Room

Building
Floor
Zone
Room

Building
Floor
Zone
Room

Building
Floor
Zone
Room
Desk

Building
Floor
Zone
Room
Desk



Increasing accuracy – with caveats!

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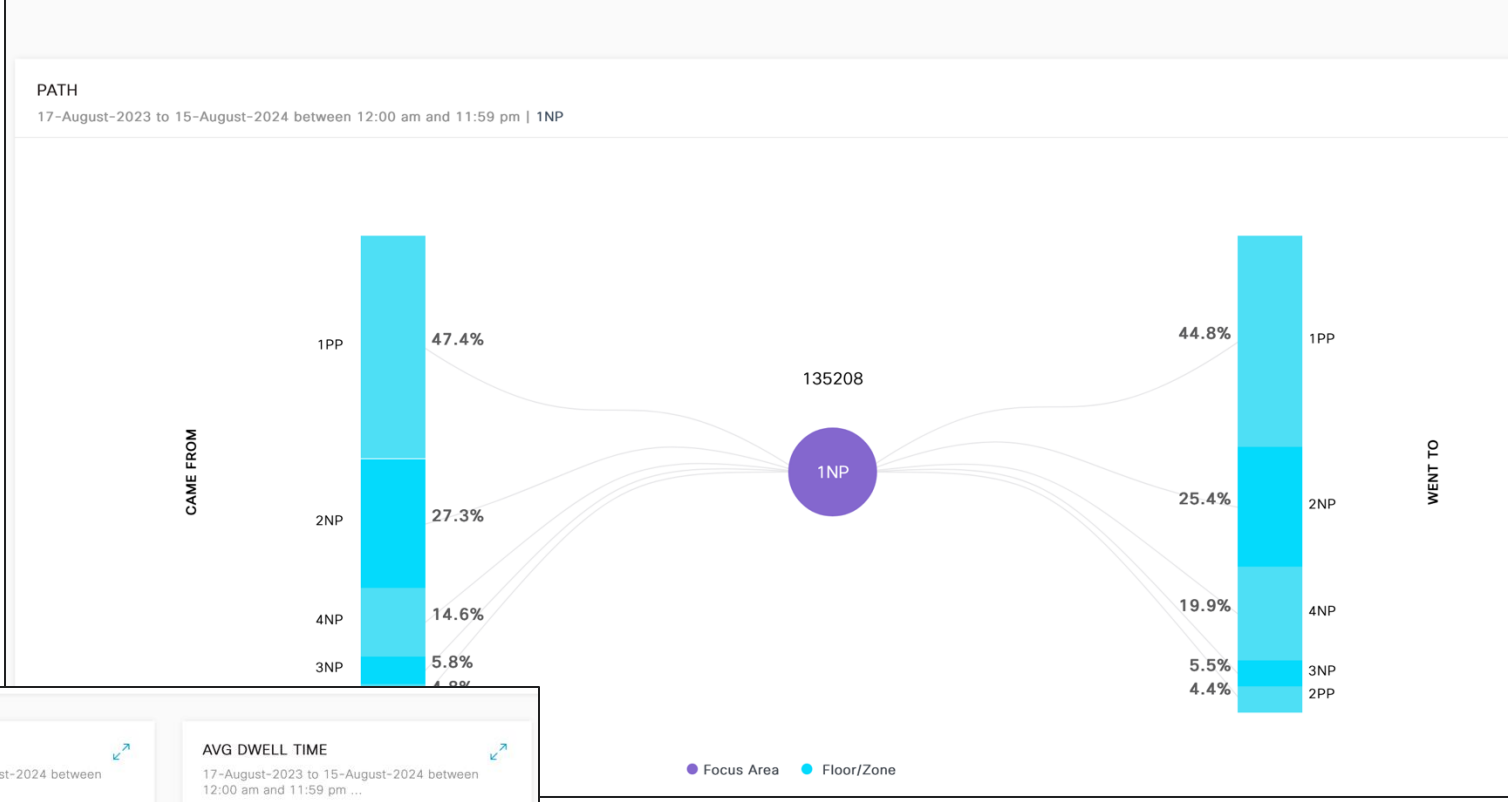
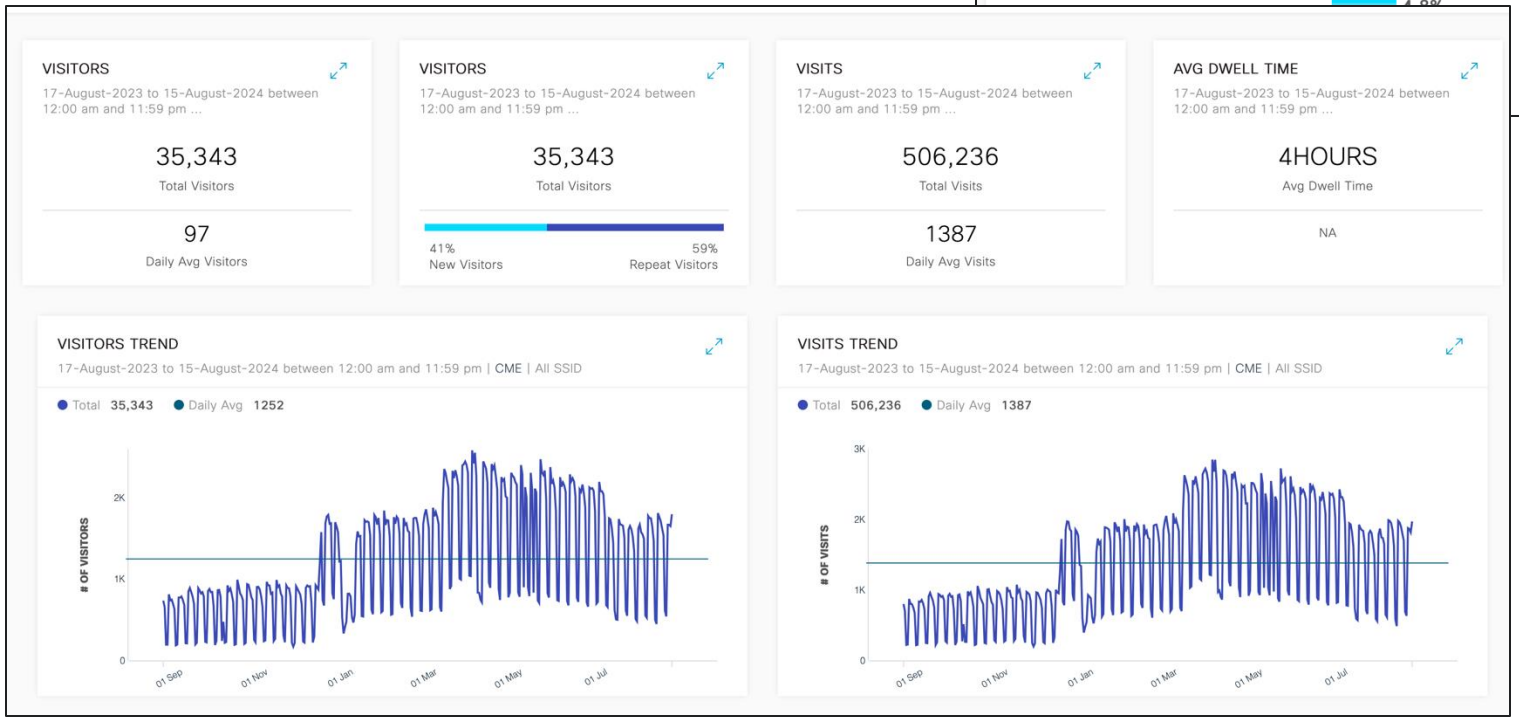
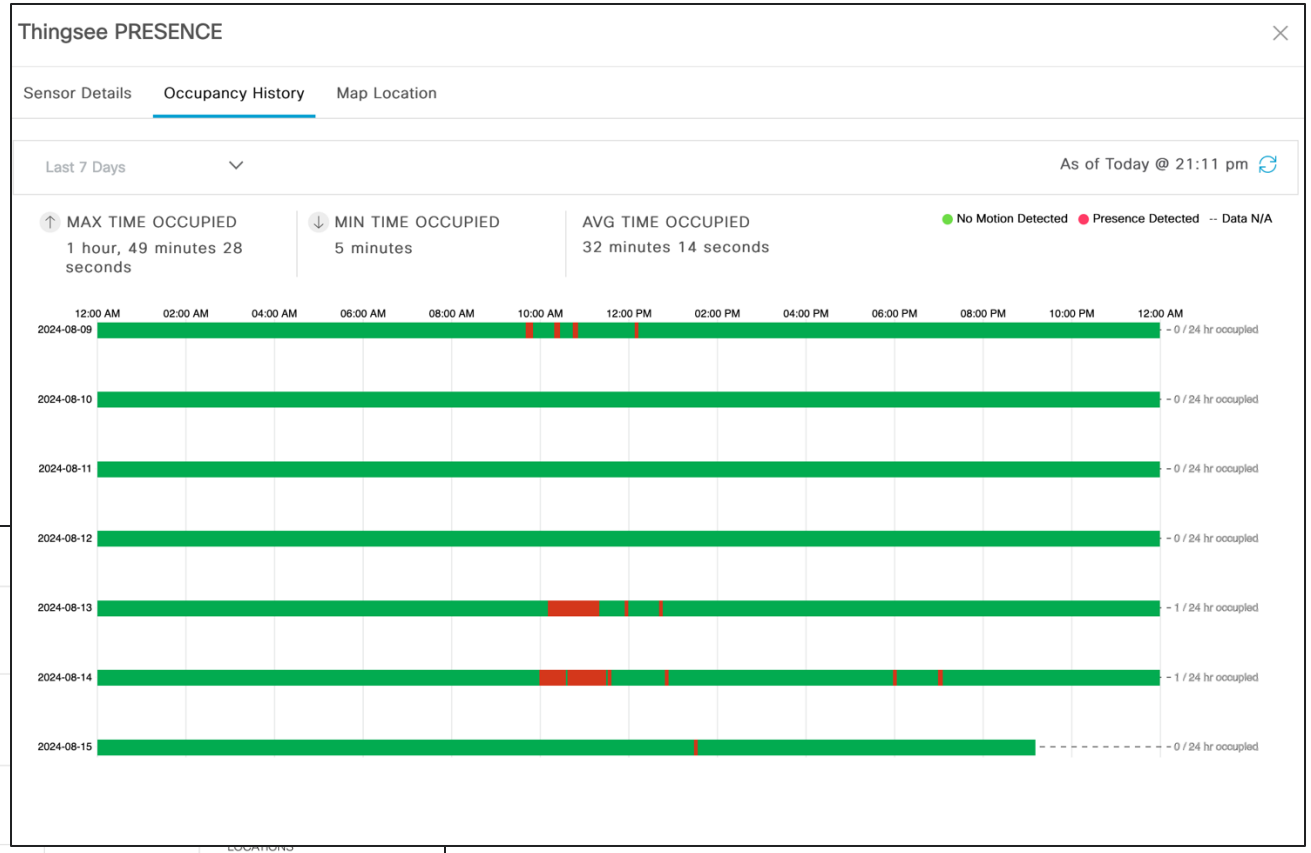
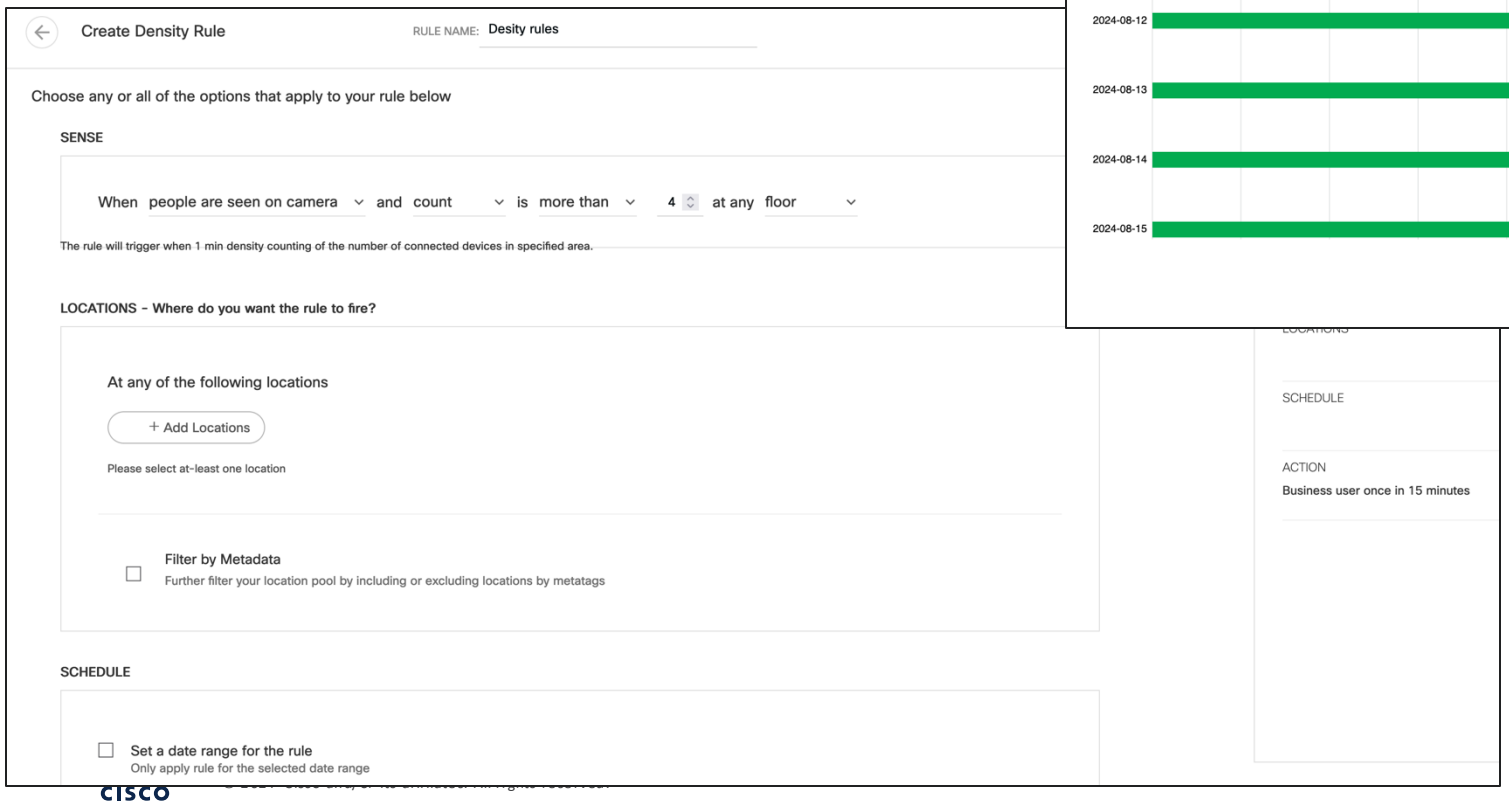
Jak to vypadá?





Jak to vypadá?





Cisco San Francisco SFO12

4th Floor

24 Meeting Rooms on this floor

17	0	1	6
Available	Booked	Occupied	No Data

Find available meeting Rooms

Room Finder

Data Source: Webex

Floor Occupancy: Very Low

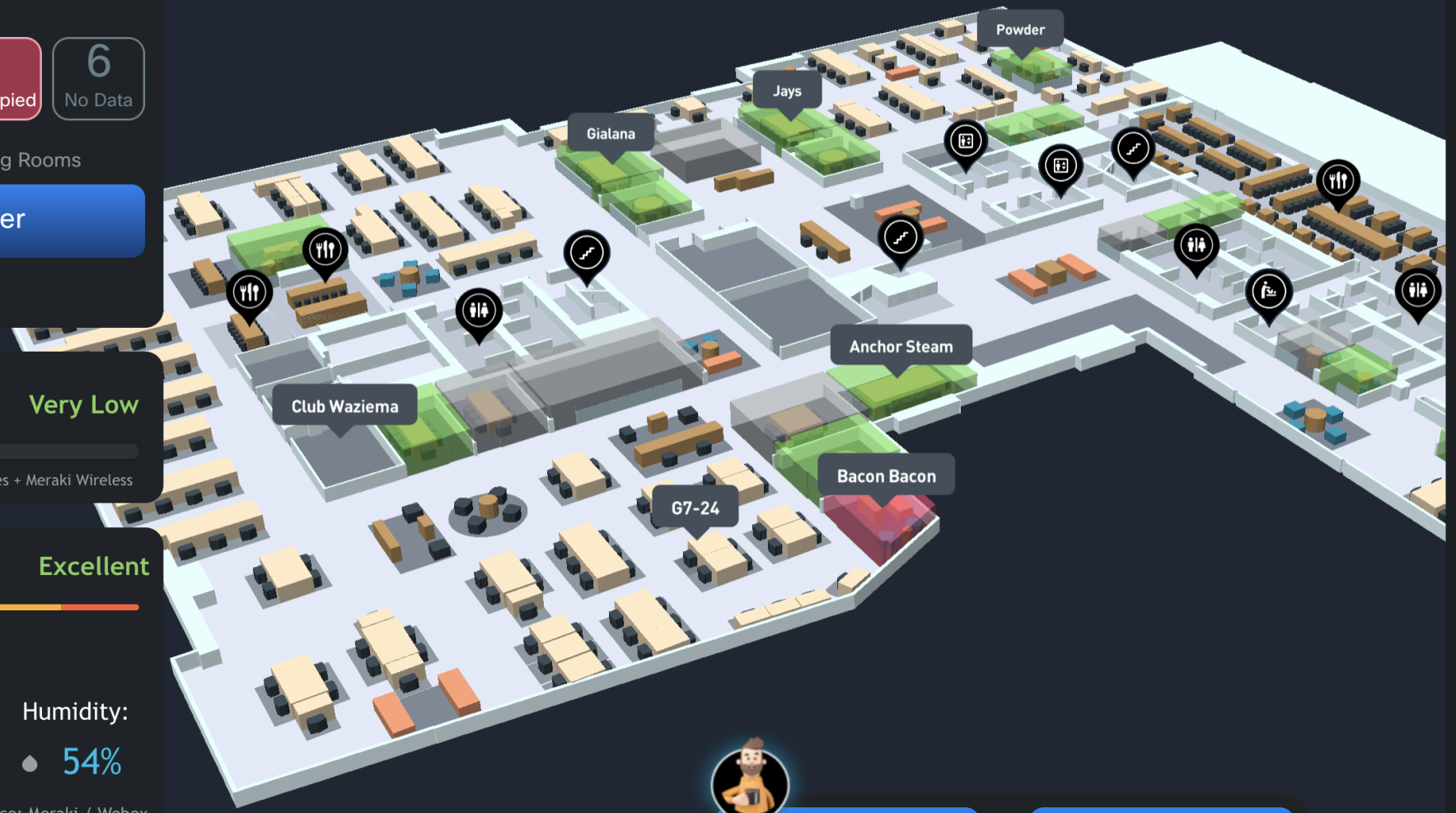
Cisco Spaces + Meraki Wireless

Indoor Air Quality: Excellent

Temperature: 72 °F

Humidity: 54%

Data Source: Meraki / Webex



Where Am I?

Reset Map

Anchor Steam

Collaboration device in this room

This meeting room is: Available

11:55PM

Later today:

12AM

2AM

4AM

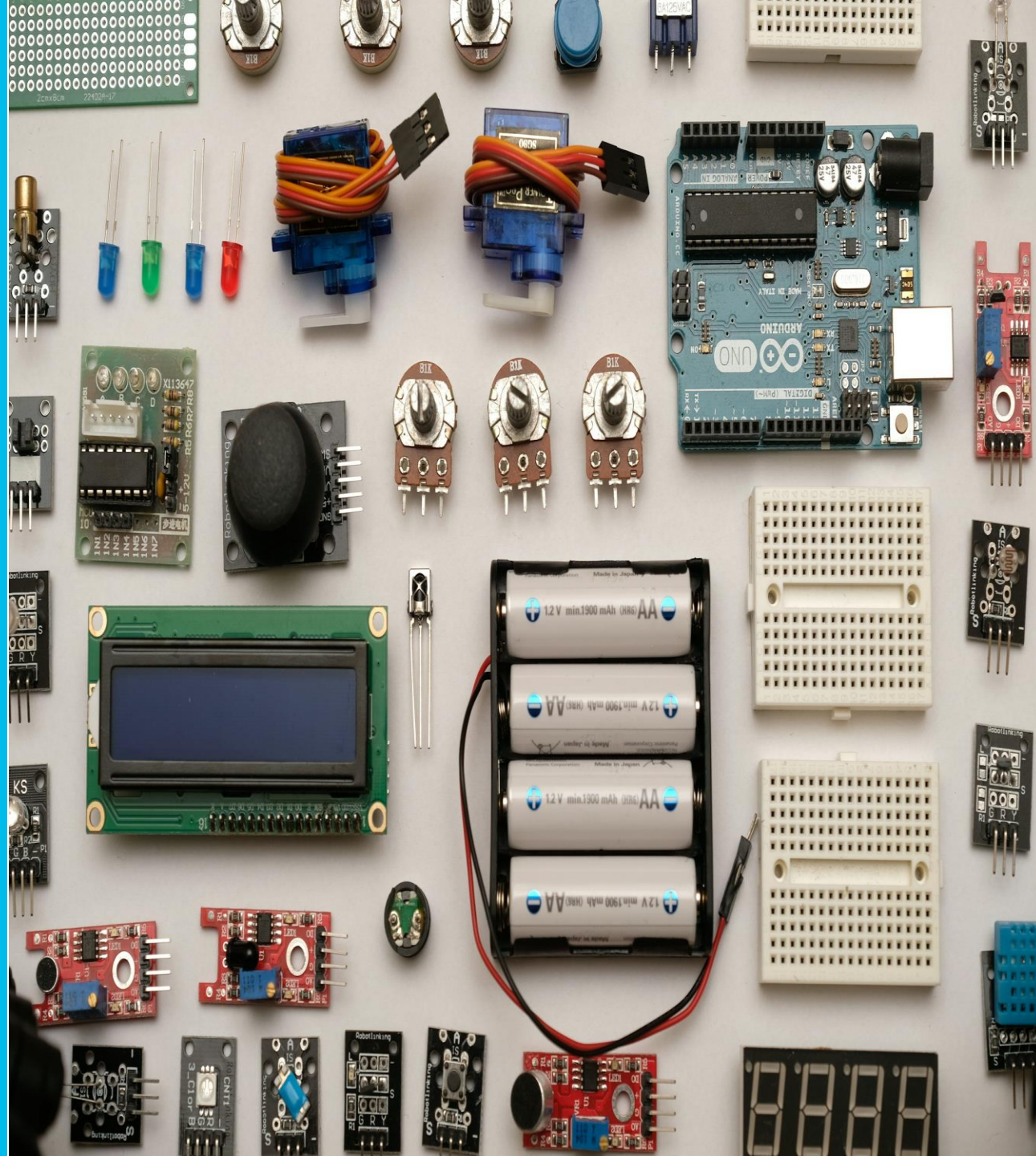
6AM

Want to use this room?

Put it on hold for 3min. while you make your way to it.

Powered by : cisco SPACES webex

Environmentální měření



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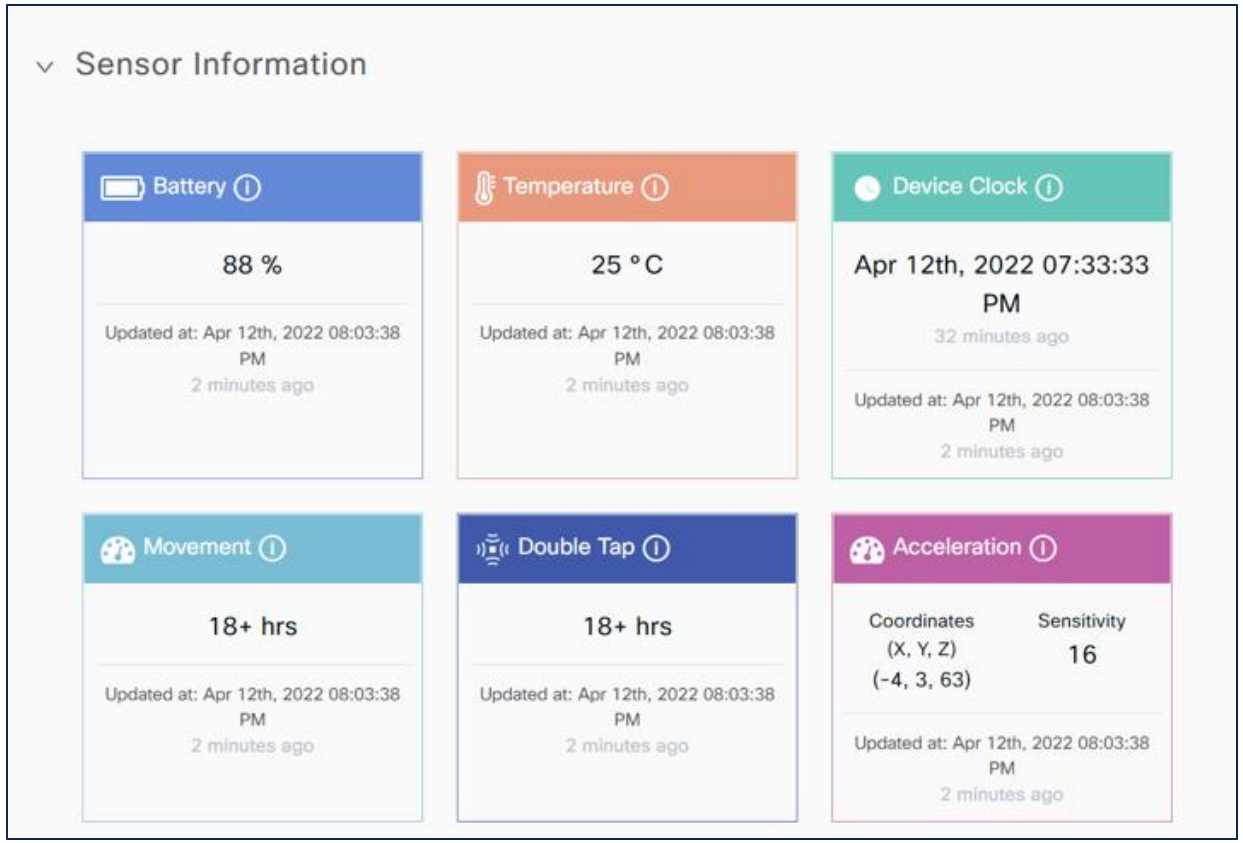
Jaké jsou možnosti?

BLE Devices

IoT BLE Device Sensor Telemetry



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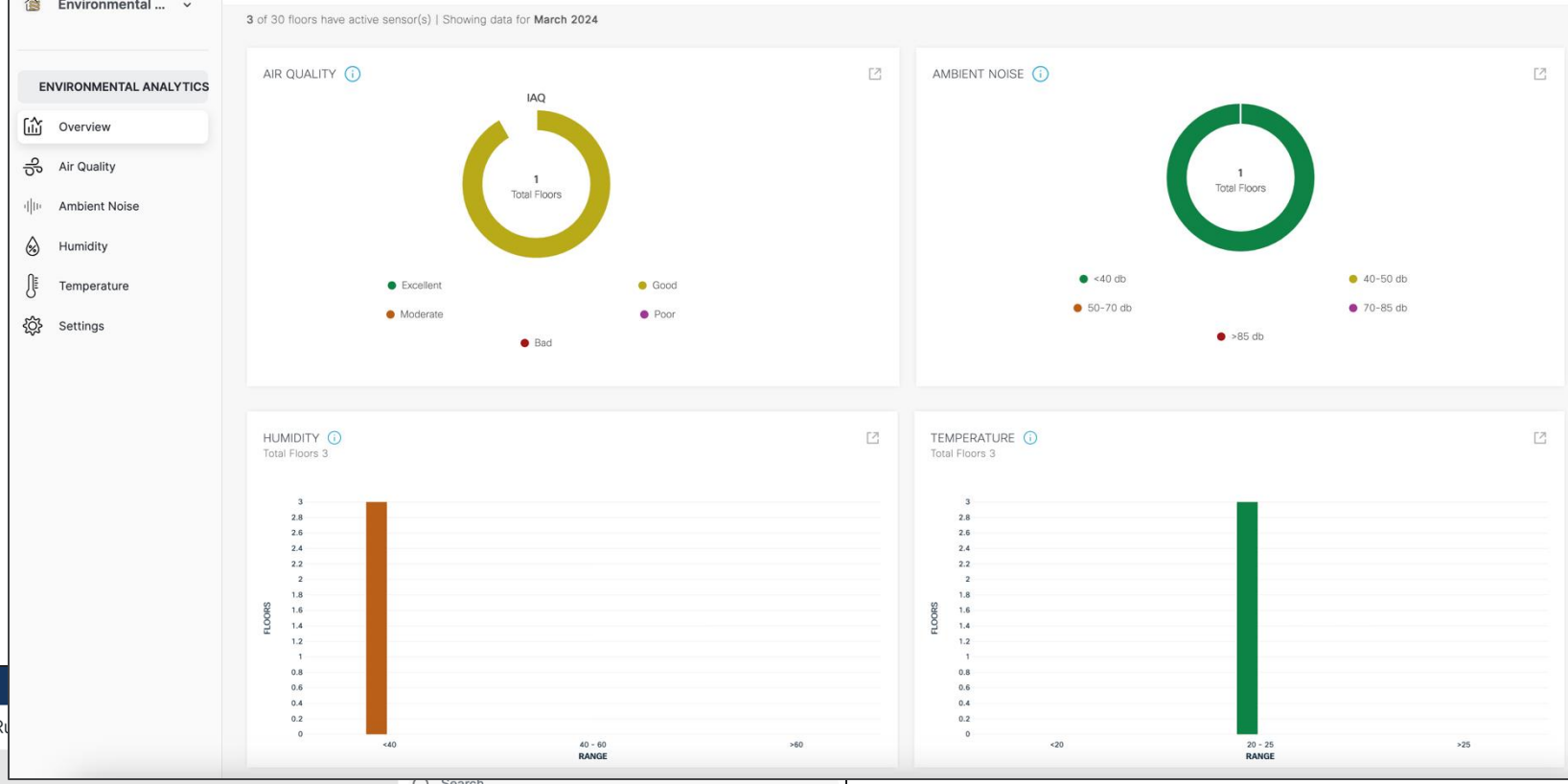
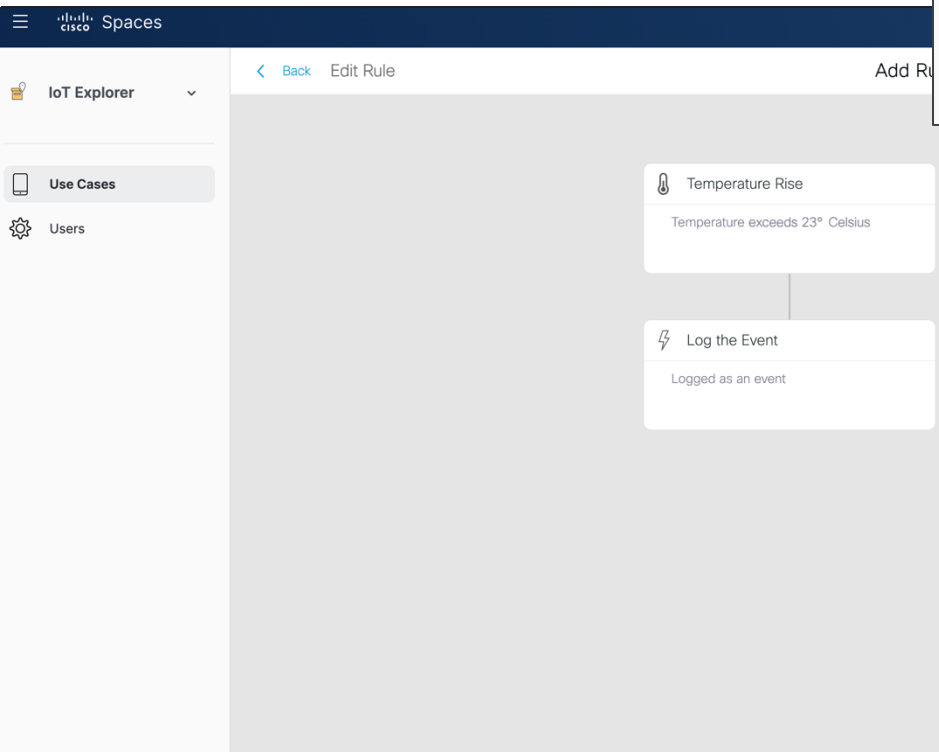
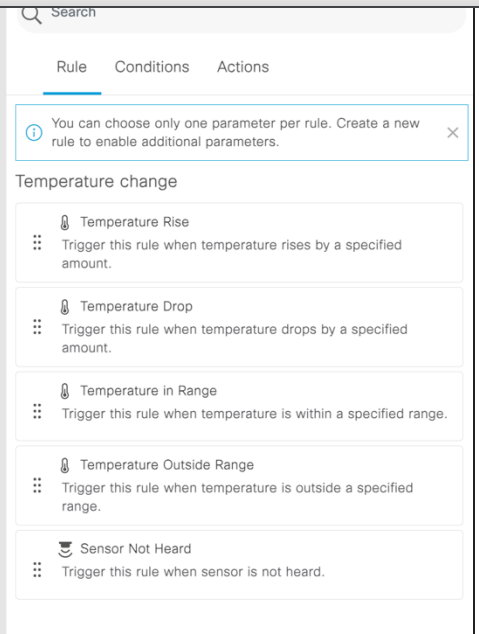
Jak to vypadá?







Děkujeme za Vaši pozornost

Následující Tech Club webinář:

1.10. Cisco Services – moderní služby pro Vaší moderní IT infrastrukturu

V následujícím Tech Club webináři se zaměříme na oblast Cisco Services a ukážeme Vám, co všechno dokážou služby Cisco přinést pro zefektivnění operativních činností a zjednodušení života pro zákazníka. Začneme rychlým opakováním základů, ale hned poté se dostaneme k představení moderní služby CX Success tracks.

Přednášející: Pavol Michalík a Michal Navorka

Registrovat se můžete na oficiálním webu **Cisco Tech Club webináře**