

AI Wireless Operation

cisco Live !

When AI meets Cisco Meraki Wireless

Minse Kim
Product Manager, [@linkedin.com/in/minse-k](https://www.linkedin.com/in/minse-k)

Session ID: BRKEWN-2039

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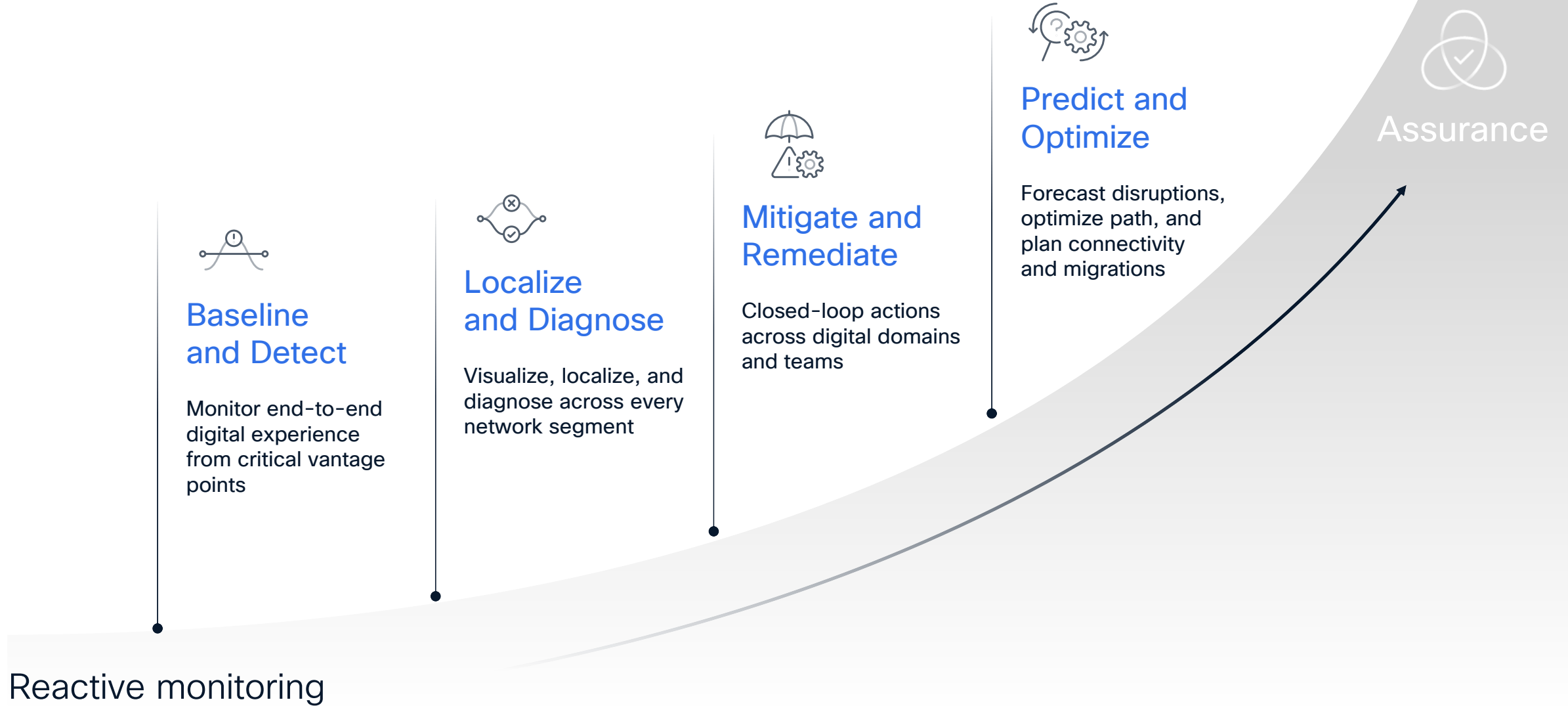
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Agenda

- 01 Meraki Assurance Overview
- 02 Client Assurance
- 03 Wireless Device Assurance
- 04 RF Optimization
- 05 AP Refresh/Deployment
- 06 AI Assistant for Wireless
- 07 Conclusion

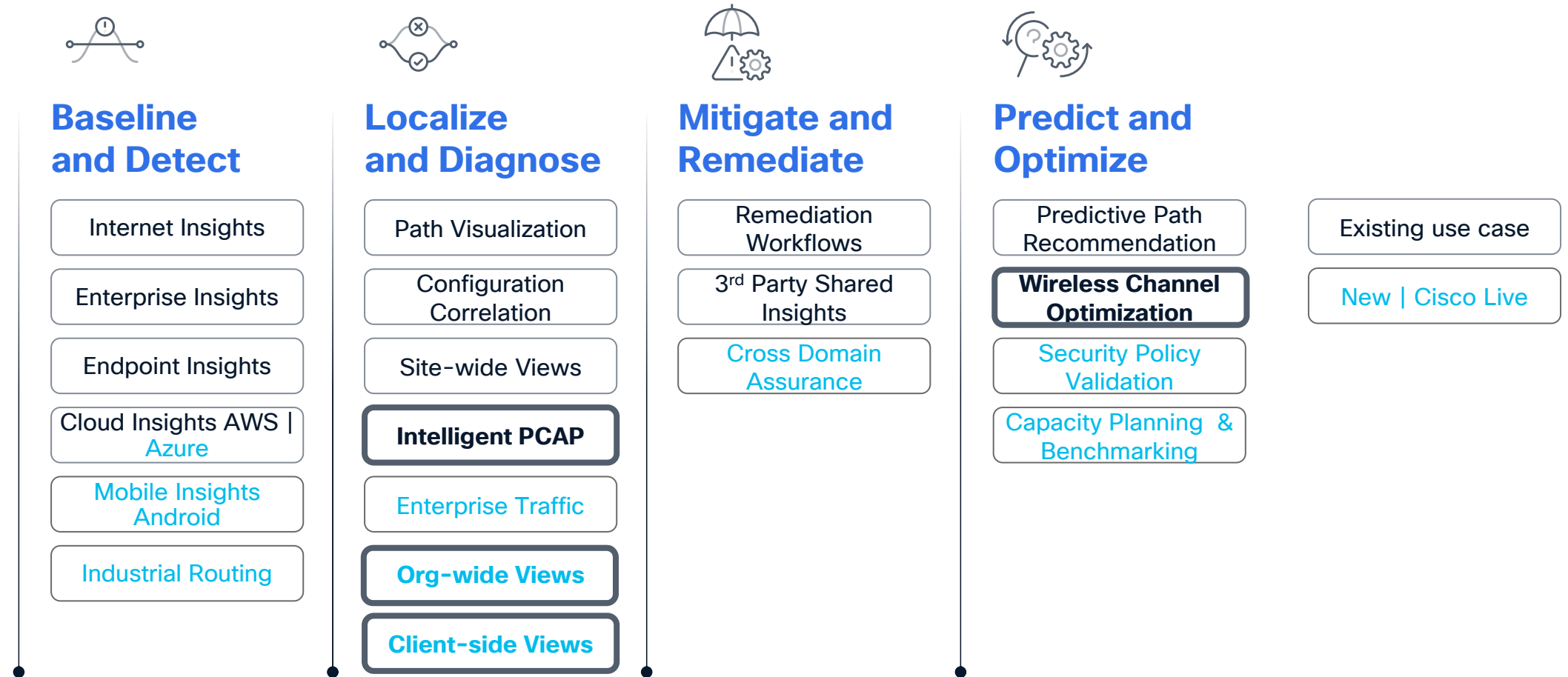
Meraki Assurance Overview

Four Stage of Assurance



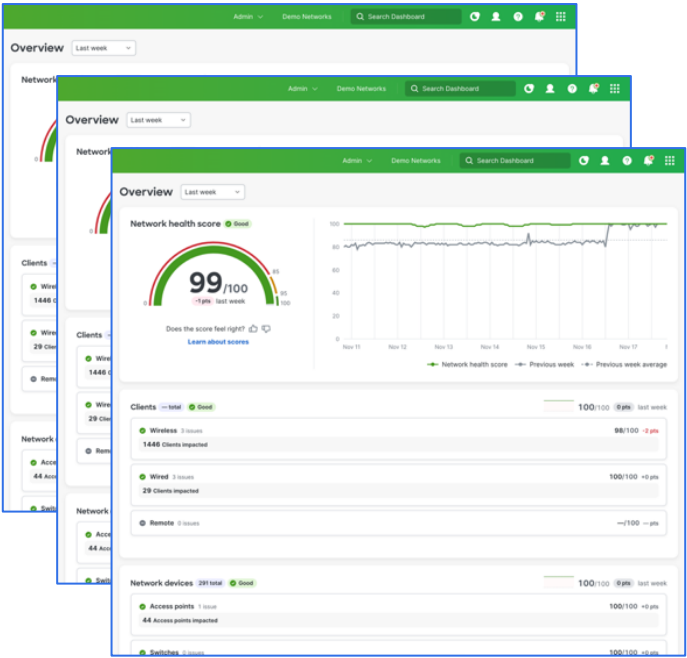
Executing Against Our Assurance Vision

Across and within network domains



Expanded Org-level assurance view

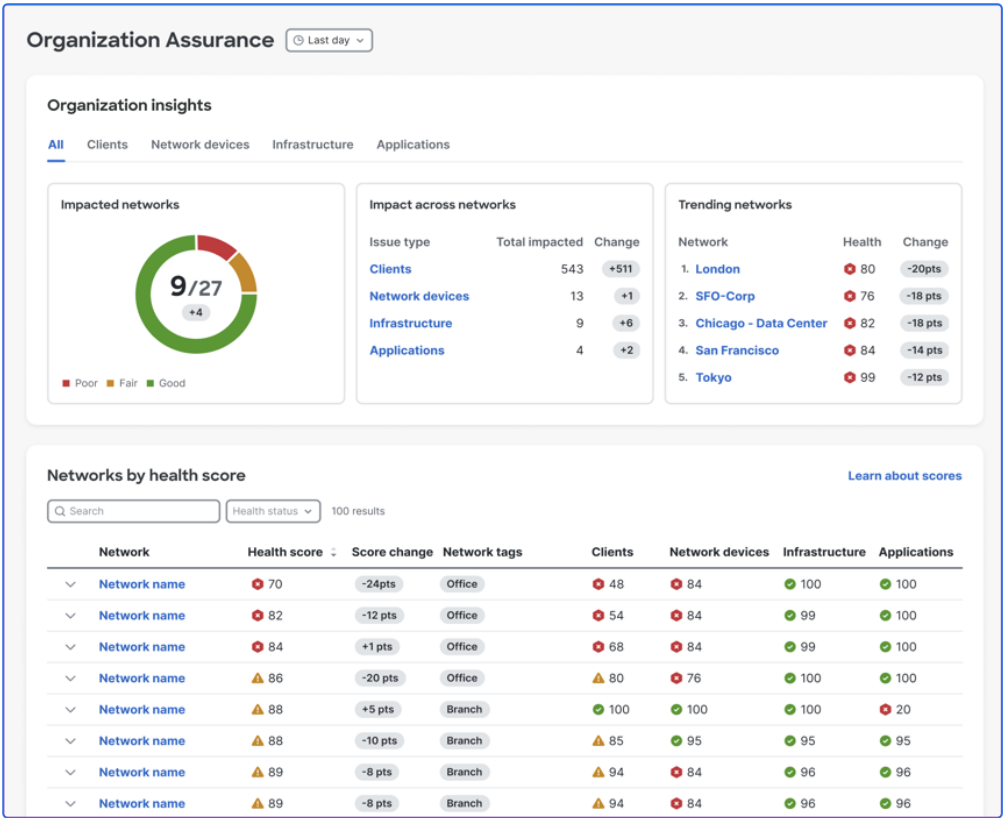
Network-wide Assurance



Network to -> Client or Device-level drill down

Org-wide Assurance

Production Beta



Org-level discovery workflow

Client Assurance

Client Event evolved overtime for explainability and correlated insights

Event log – catch all events

Event logfor access points ▾

Access point: c4:14:a2:fb:3f:70Client: AnyBefore: 06/08/2025 07:53 (PDT)

Event type include: All client events xEvent type ignore: None

SearchReset filters

Download as ▾

newerolder

Time (PDT) ▾	Access point	SSID	Client	Category	Event type	Details
Jun 8 06:36:14	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.11	802.11 disassociation	unspecified reason more
Jun 8 06:34:18	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	Wireless problems	Connectivity problem	type: NO DHCP ack, associated: true, radio: 1, vap: 0
Jun 8 06:34:08	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	Wireless problems	Connectivity problem	type: NO DHCP ack, associated: true, radio: 1, vap: 0
Jun 8 06:33:55	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	Wireless problems	Association status	radio: 1, vap: 0, is_8021x: 1 more
Jun 8 06:33:53	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.1X	802.1X authentication	radio: 1, vap: 0, client_mac: 08-6A:C5-6A:14-27, identity: wallboard.sfo12
Jun 8 06:33:53	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.1X	Successful authentication (EAP success)	radio: 1, vap: 0, client_mac: 08-6A:C5-6A:14-27, identity: wallboard.sfo12
Jun 8 06:33:53	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.1X	RADIUS response	radio: 1, vap: 0, group: more
Jun 8 06:33:53	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.1X	RADIUS response	radio: 1, vap: 0, group: more
Jun 8 06:33:53	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.11	802.11 association	channel: 104, rssi: 35, band: 5 more
Jun 8 06:33:52	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	Wireless problems	Association status	radio: 1, vap: 0, is_8021x: 1 more
Jun 8 06:33:51	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.1X	802.1X authentication	radio: 1, vap: 0, client_mac: 08-6A:C5-5A-0E-BF, identity: wallboard.sfo12
Jun 8 06:33:51	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.1X	Successful authentication (EAP success)	radio: 1, vap: 0, client_mac: 08-6A:C5-5A-0E-BF, identity: wallboard.sfo12
Jun 8 06:33:51	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.1X	RADIUS response	radio: 1, vap: 0, group: more
Jun 8 06:33:51	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.11	802.11 association	channel: 104, rssi: 53, band: 5 more
Jun 8 06:33:49	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	Wireless problems	Association status	radio: 1, vap: 0, is_8021x: 1 more
Jun 8 06:33:47	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	802.1X	802.1X authentication	radio: 1, vap: 0, client_mac: 08-6A:C5-5C-55-8A, identity: wallboard.sfo12
Jun 8 06:33:47	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	802.1X	Successful authentication (EAP success)	radio: 1, vap: 0, client_mac: 08-6A:C5-5C-55-8A, identity: wallboard.sfo12
Jun 8 06:33:47	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	802.1X	RADIUS response	radio: 1, vap: 0, group: more
Jun 8 06:33:47	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	802.1X	RADIUS response	radio: 1, vap: 0, group: more
Jun 8 06:33:47	sfo12-4-ap-035	Meraki-Corp	eb08a3a536f8e2b217345adaef9a9e42	802.11	802.11 association	channel: 104, rssi: 49, band: 5 more
Jun 8 06:00:32	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.11	802.11 disassociation	client was deauthenticated more
Jun 8 06:00:22	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.11	802.11 association	channel: 104, rssi: 53, band: 5 more
Jun 8 06:00:21	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.11	802.11 association	channel: 104, rssi: 38, band: 5 more
Jun 8 06:00:16	sfo12-4-ap-035	Meraki-Guest	g0106f0552a34f56142a3d5c5b578aaf	Wireless problems	Association status	radio: 1, vap: 10, is_8021x: 1 more
Jun 8 06:00:15	sfo12-4-ap-035	Meraki-Guest	g0106f0552a34f56142a3d5c5b578aaf	802.1X	802.1X authentication	radio: 1, vap: 10, client_mac: 08-6A:C5-69-A4-A6
Jun 8 06:00:15	sfo12-4-ap-035	Meraki-Guest	g0106f0552a34f56142a3d5c5b578aaf	802.11	802.11 association	channel: 104, rssi: 50, band: 5 more
Jun 8 03:41:30	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.1X	802.1X authentication	radio: 1, vap: 0, client_mac: 08-6A:C5-5A-0E-BF more
Jun 8 03:41:30	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.1X	Successful authentication (EAP success)	radio: 1, vap: 0, client_mac: 08-6A:C5-5A-0E-BF more
Jun 8 03:41:30	sfo12-4-ap-035	Meraki-Corp	40aa88c199e91cc782ce9ddec75b711	802.1X	RADIUS response	radio: 1, vap: 0, group: more
Jun 7 21:01:54	sfo12-4-ap-035	Meraki-Corp	g3d78542fc1d0694b617553cec4795f1	802.11	802.11 disassociation	unspecified reason more

30 total

Client Timeline – descriptive client event logs

CLIENTSGalaxy-A12Try new version

OverviewConnectionsPerformanceRoamingTimelineStored captures

HistoryJun 7 08:00 to Jun 8 08:00 ▾

SSIDAll SSIDs

ACCESS POINTAll Access Points

BANDAll bands

CONNECTION STEPAll connections

STATUSAll statuses

PACKET CAPTUREAll

Jun 8 06:17:17

Roamed from access point sfo12-4-ap-044-elev then had a failed connection to SSID Meraki-Guest-OWE on access point sfo12-4-ap-013 during authentication because the client did not provide credentials.

Channel52

Band5 GHz

SNR43 dB

Meraki ReasonEAPoL timeout

Download packet captureView in packet viewer

Jun 8 06:16:41

Successful connection to SSID Meraki-Guest-OWE for a few seconds on access point sfo12-4-ap-044-elev.

Channel132

Band5 GHz

SNR42 dB

Time to Connect490 ms

Jun 8 06:16:33

Roamed from access point sfo12-4-ap-020 then had a failed connection to SSID Meraki-Guest-OWE on access point sfo12-4-ap-044-elev during authentication because the client did not provide credentials.

Channel132

Band5 GHz

SNR41 dB

Meraki ReasonEAPoL timeout

Jun 8 06:16:05

Successful connection to SSID Meraki-Guest-OWE for a few seconds on access point sfo12-4-ap-020, and then the client roamed to access point sfo12-4-ap-044-elev.

Channel161

Band5 GHz

SNR35 dB

Time to Connect450 ms

Jun 8 06:15:55

Roamed from access point sfo12-4-ap-014 then had a failed connection to SSID Meraki-Guest-OWE on access point sfo12-4-ap-044-elev during authentication because the client did not provide credentials, and then the client roamed to access point sfo12-4-ap-020.

Channel11

Band2.4 GHz

SNR46 dB

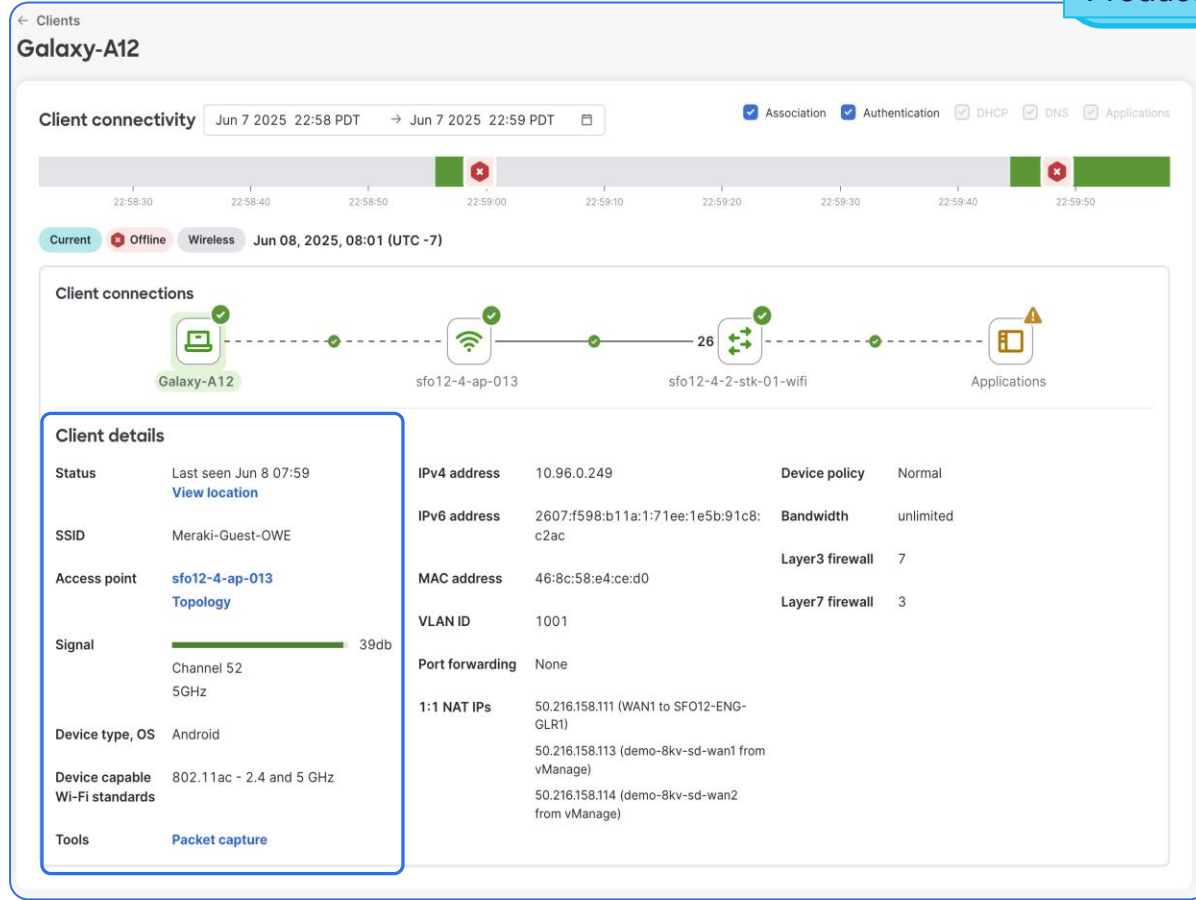
Meraki ReasonEAPoL timeout

- Raw client event log
- Most detailed, Expert tool

- Various type filters
- Highlight the reason code and RF condition
- Proactive Packet Capture integrated

Client 360 - Brings all the internetworking level timeline view to the forefront of the client page

Product Beta



Client 360 for Meraki Dashboard

- Client Connection and session time of
- Network-wide client experience with timeline
- E2E network correlation and Topology
- Client connection details
- Easy chronical navigations of failed event
- Click to Zoom in
- Integrated Tools access (e.g Packet capture, Ping)

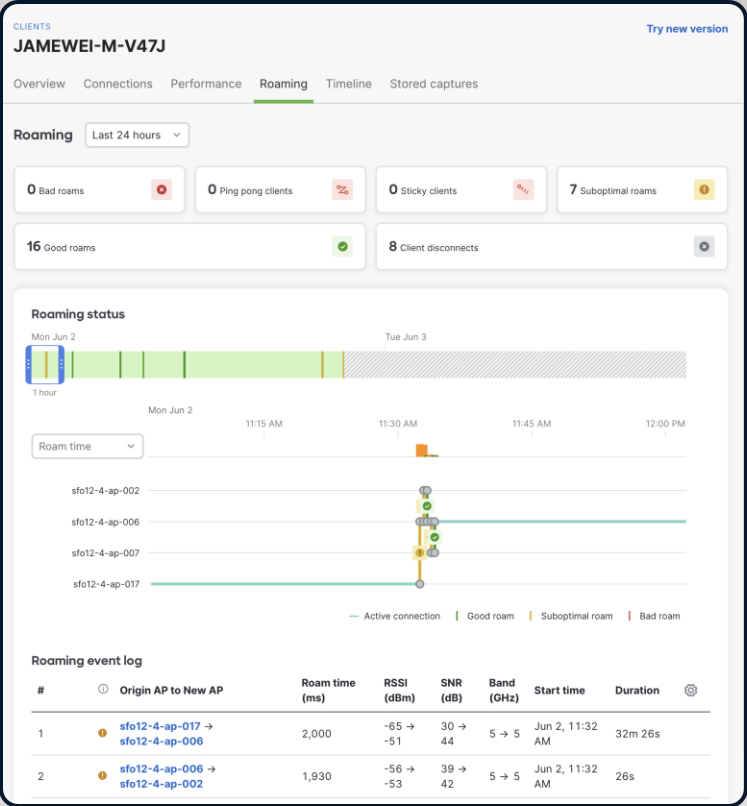
Layer 2 Connectivity

Layer 3 Network info

Network Policy

Roaming Analytics

Tools for per-device and network-wide troubleshooting



Per-Client Roaming Timeline



Network-wide Roaming Health

Intelligent Capture

Next Generation Packet Capture Solution for Wired and Wireless

Meraki

Network-wide

Security & SD-WAN

Switch

Wireless

Systems Manager

Camera

Sensors

Insight

Organization-wide

Packet Captures

Capture Name (Analysis)

Packet capture

Time	Source	Destination	Protocol	Transaction ID	Transaction ID	Info
1 0.000000	192.168.128.2	192.168.129.45	DNS	0xef4f		Standard query 0xef4f A dns.msftncsi.com
2 0.398151	192.168.128.2	192.168.129.45	DNS	0xd1c7		Standard query 0xd1c7 A dns.msftncsi.com
3 0.780715	fe80::a1e8:b...	ff02::1:2	DHCP			Solicit XID: 0x8eaa32 CID: 000100012a84816b54e1a
4 1.405498	192.168.128.2	192.168.129.45	DNS	0xd1c7		Standard query 0xd1c7 A dns.msftncsi.com
5 1.686510	CiscoMer_eei...	Spanning-tree (for...	STP			RST, Root = 4096/0/e0:55:3d:c4:3d:78 Cost = 215
6 1.837274	192.168.128.2	192.168.129.45	DNS	0x642a		Standard query 0x642a A self.events.data.microso
7 2.014230	192.168.128.2	192.168.129.45	DNS	0xef4f		Standard query 0xef4f A dns.msftncsi.com
8 3.300038	CiscoMer_00:...	LCFChFe_51:fa:5c	ARP			Who has 192.168.128.2? Tell 192.168.128.1
9 3.301814	LCFChFe_51:...	CiscoMer_00:db:7b	ARP			192.168.128.2 is at 54:e1:ad:51:fa:5c
10 3.387856	192.168.128.2	192.168.129.45	ICMP			Echo (ping) request id=0x0001, seq=34/8704, ttl
11 3.414848	192.168.128.2	192.168.129.45	DNS	0xd1c7		Standard query 0xd1c7 A dns.msftncsi.com
12 3.697035	CiscoMer_eei...	Spanning-tree (for...	STP			RST, Root = 4096/0/e0:55:3d:c4:3d:78 Cost = 215
13 5.697478	CiscoMer_eei...	Spanning-tree (for...	STP			RST, Root = 4096/0/e0:55:3d:c4:3d:78 Cost = 215
14 5.888320	192.168.128.2	192.168.129.45	DNS	0xfd41		Standard query 0xfd41 A wpad.supportlab.ikarem.3
15 6.027472	192.168.128.2	192.168.129.45	DNS	0xef4f		Standard query 0xef4f A dns.msftncsi.com
16 6.373097	CiscoMer_eei...	CDP/VTP/DTP/PagP/U...	UDLD			Device ID: 149F43EE4C60 Port ID: 11
17 6.888997	192.168.128.2	192.168.129.45	DNS	0xfd41		Standard query 0xfd41 A wpad.supportlab.ikarem.i
18 7.470200	107.168.178.2	107.168.170.45	DNS	0xd1c7		Standard query 0xd1c7 A dns.msftncsi.com

Frame 1: 76 bytes on wire (608 bits), 76 bytes captured (608 bits)
Ethernet II, Src: LCFChFe_51:fa:5c (54:e1:ad:51:fa:5c), Dst: CiscoMer_00:db:7b (0c:8d:db:00:db:7b)
Destination: CiscoMer_00:db:7b (0c:8d:db:00:db:7b)
Source: LCFChFe_51:fa:5c (54:e1:ad:51:fa:5c)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 192.168.128.2, Dst: 192.168.129.45
User Datagram Protocol, Src Port: 58977, Dst Port: 53
Domain Name System (query)

Packet Capture Analysis

The packet capture analytics tool looks for 4/10 categories of possible issues in your packet capture. Please note that even if it does not show any issues in the results below it is only reporting on Rogue DHCP, ARP, DNS, and ICMP issues.

Packet capture analysis summary

Tests summary

Protocols

DHCP

DNS

ICMP

ARP

MAC address summary

Device summary

DNS

ARP

DHCP

ICMP

Proactive

Automated

Integrated

Last login

about 2 hours ago from your current IP address

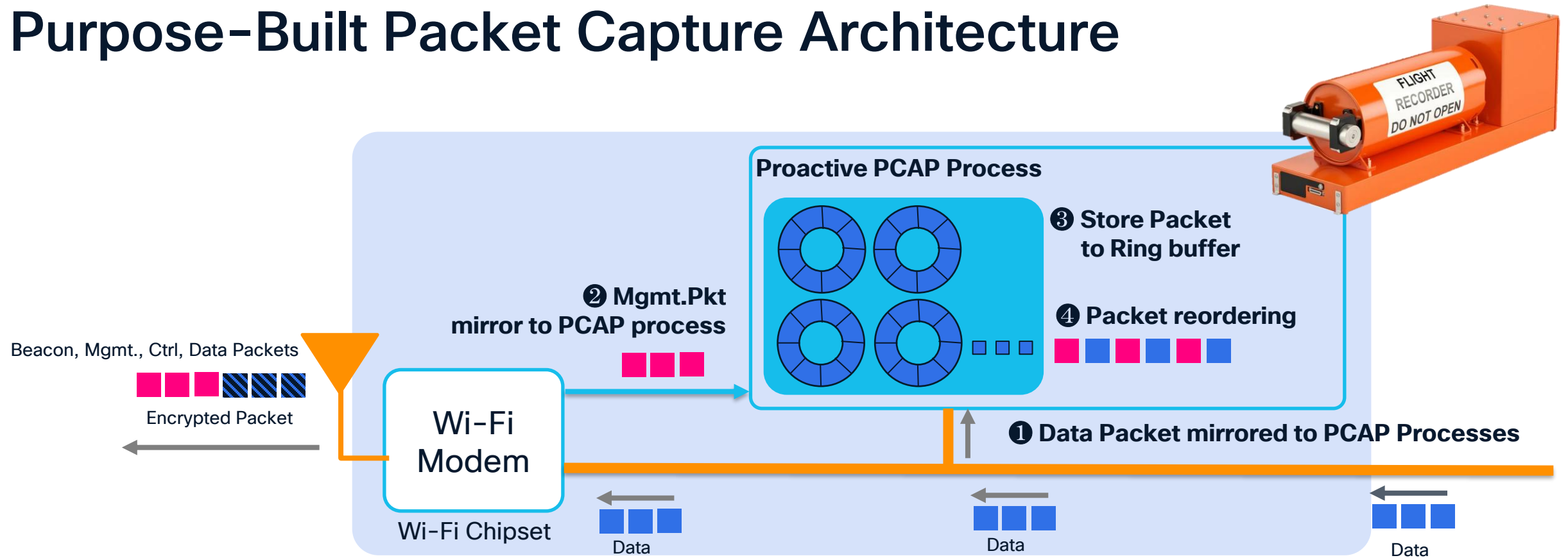
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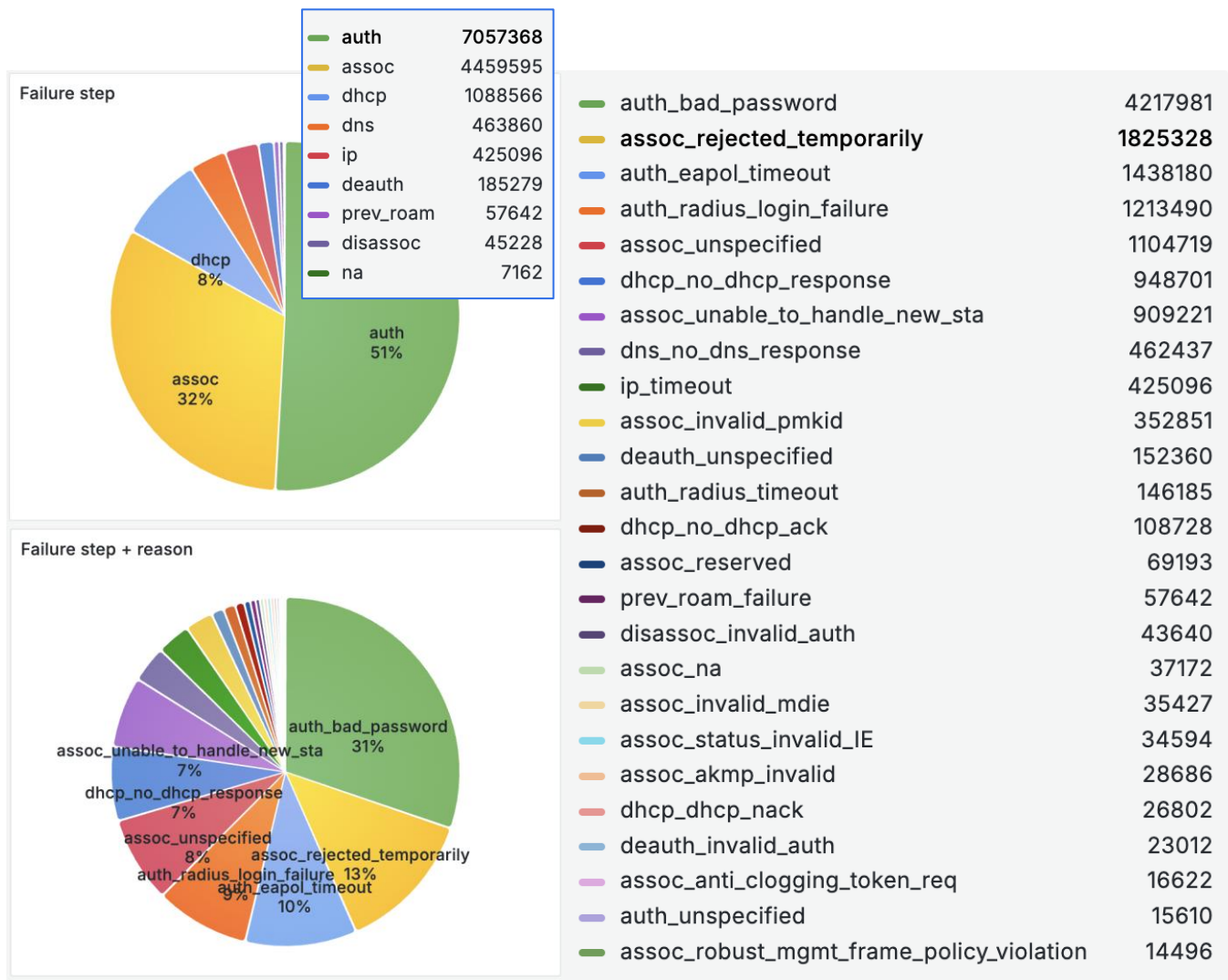
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Purpose-Built Packet Capture Architecture



- Packet Capture doesn't change AP or radio mode and continue to serve client without any performance impact
- Management Frames from modem gets replicated and copied back into PCAP Buffer
- Resequencing packet capture frame between Data Frame and Management frame in the right order
- Per-Client Ring Buffer for Proactive PCAP enabled concurrent packet capture

Proactive Packet automatically take a PCAP on all of client failures conditions



Proactive PCAP
automatically
collect Wireless PCAP
All the time at every
connection failure

including “unknown
failure” cases

Intelligent Capture - MR

Interpreted

Engaged

Automated

Integrated

Available

Packet Analyzer*

Conversational Interface

Proactive Packet Capture

Timeline RCA

Assurance Failure Type

Scheduled PCAP

Packet Viewer

On-Demand

Cloud Storage

MS/MR Common API Endpoint

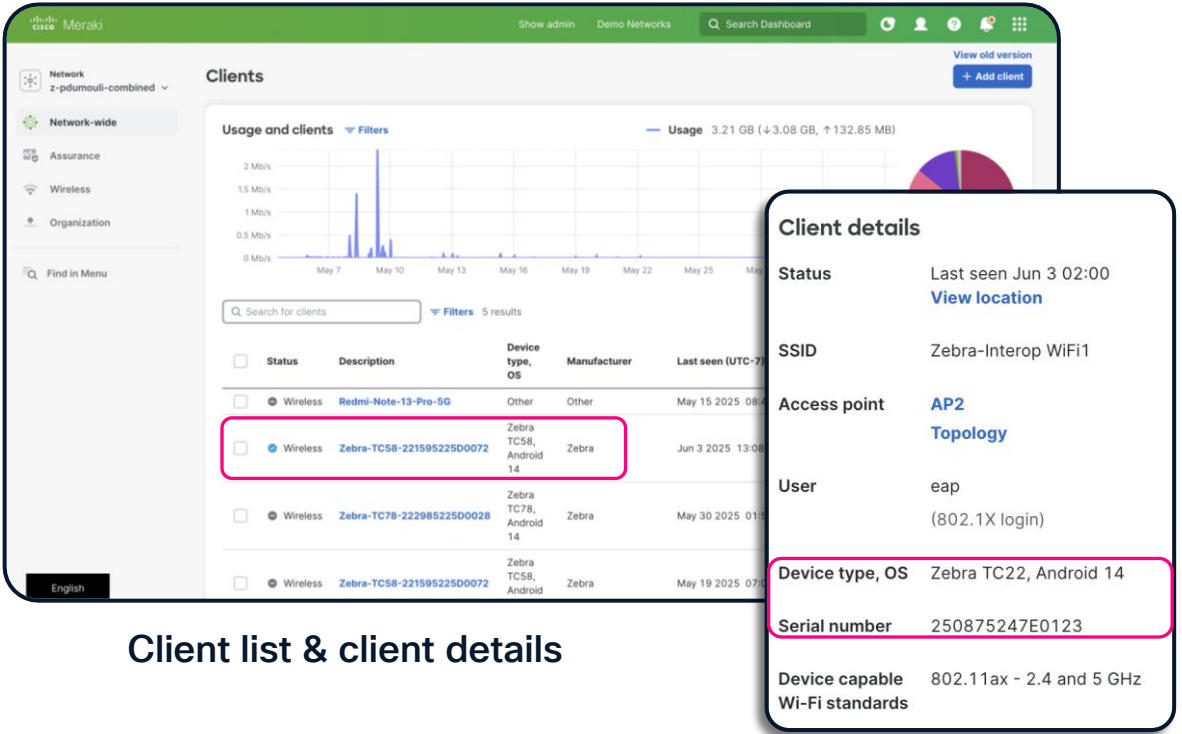
- Every client connection failure condition leaves Packet as evidence
- PCAP Analyzer shows exact reason why client failed to connect

The screenshot displays the Meraki Packet Capture Analysis interface. The top section shows a list of captured packets with columns for Time, Source, Destination, Protocol, Transaction ID, and Info. Below this, the 'Packet capture analysis summary' section provides a detailed breakdown of the analysis results, including tests for DNS, DHCP, ARP, ICMP, and MAC address resolution. The summary indicates that several tests failed, such as 'DNS 3/3 tests failed' and 'DHCP 3/3 tests failed', while others passed, like 'ICMP All tests passed'.

Zebra Client Details

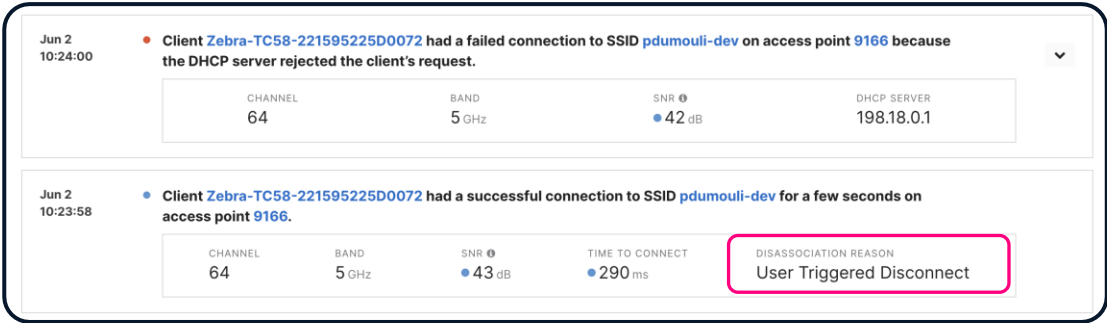
New integration includes:

- Device model
- OS
- Manufacturer
- Serial number
- Disconnect reason codes



Client list & client details

Timeline view



Demo – Client Assurance

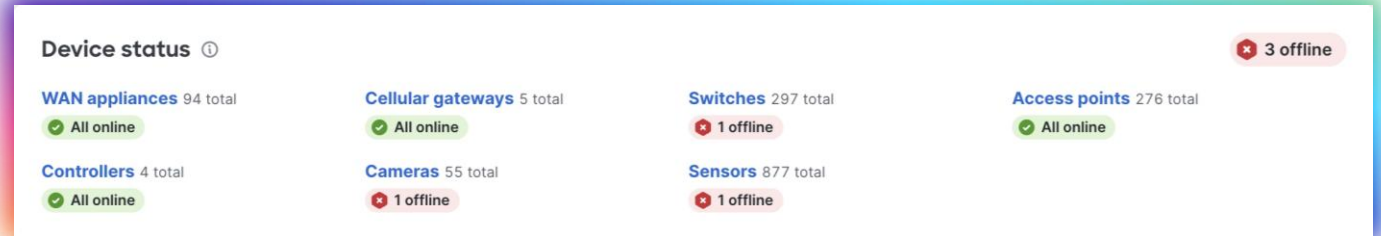
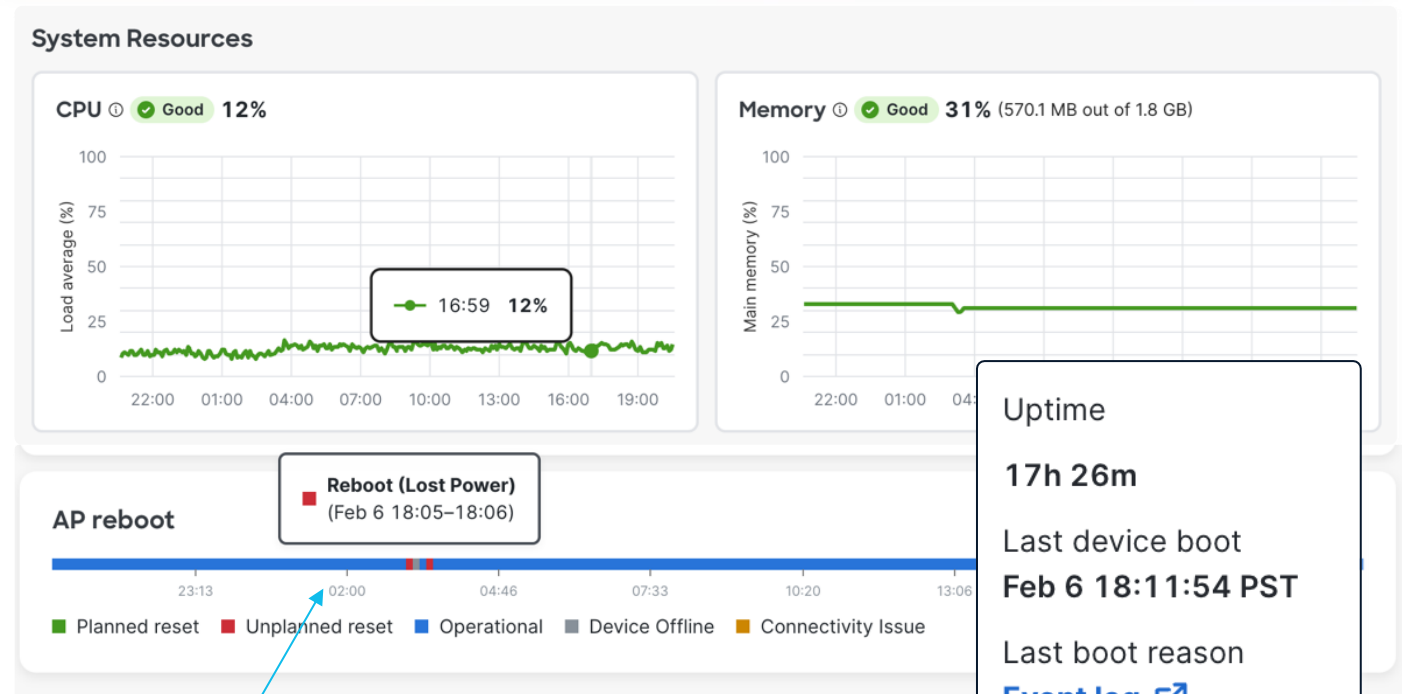
Wireless Device Assurance

AP Device Health

Don't forget the basic

- Device availability
- CPU and Memory utilization – latest & trend
- Detect Memory leak or CPU spikes
- PoE / Power monitoring
- Build your Own Dashboard, Org-Wide API Ready!

`/organizations/{organizationId}/wireless/devices/system/cpu/load/history`



Uptime
17h 26m

Last device boot
Feb 6 18:11:54 PST

Last boot reason
[Event log](#) [Documentation](#)

Contextual AP Uptime trend

AP Alert Root Cause Analysis

This is a Cisco internal organization.

← Access points ←

68:49:92:98:ae:70 Alerting repeater

CW9166I 68:49:92:98:ae:70

Access point became repeater.



Address

—

SSIDs

—

Firmware

Firmware version locked, please contact support

Access point became repeater

68:49:92:98:ae:70 has switched to repeater mode to avoid losing internet connection.

68:49:92:98:ae:70 · z-pdumouli-wireless · Jun 2 2025 at 10:11 PDT

Details Suggested actions 1

1. Resolve misconfigured VLAN

The access point has been assigned to a VLAN that isn't configured to connect to the Meraki cloud. The recommended solution is to match the native VLAN settings of the repeater and gateway access points.

Access point	68:49:92:98:ae:70 (repeater)	68:49:92:f9:a3:30 (gateway)
IPv4 address(es)	—	10.30.104.119
IPv6 address(es)	—	—
Connected switch	Switch_automation/1	Switch_automation/5
Type	trunk	trunk
Allowed VLANs	1-1000	1-1000
Native VLAN	3	1 Recommended

Edit manually

Accept recommendation

- Detect AP which became repeater.
- RCA Engine lists all the possible scenario and provides active RCA steps to corresponding root cause.
 - Lost gateway connectivity
 - DHCP doesn't serve IP address to it's wired uplink port
 - Config change (Config management)
 - AP firmware mismatch
 - Last resort, force AP reboot

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BRKEWN-2039



Suggested actions for assisted device alert remediation

The image displays three overlapping screenshots of the Cisco Network Traffic Analysis (NTA) interface, illustrating suggested remediation actions for network alerts.

Top Screenshot: "Unplanned low power mode"

- Alert: **Unplanned low power mode** (Active)
- Source: OC-Yamaha-PoE-Interop_CW62_802.3af-PoE-Injector
- Time: Jun 6 2025 at 22:07 PDT
- Tab: **Suggested actions** (1)
- Action 1: **1. Check PoE budget**

Middle Screenshot: "Ethernet uplink speed degrade"

- Alert: **Ethernet uplink speed degrade**
- Details: The data rate from MS120-1/3 is capped at 100 Mbps
- Source: MR36H-Office / 0 · Futureishere · May 28 2025 at 21:5
- Tab: **Suggested actions** (3)
- Action 1: **1. Cable test**
- Action 2: **2. Update link negotiation settings**
- Details: The link negotiation is set to **100 Megabit half duplex (forced)** may solve the problem.
- Warning: A manual override of the link negotiation on the switch on the wired uplink.
- Device Name: MS120-1
- Port: 3
- Capability: 1000 Mbps
- Link Negotiation: 100 Megabit half duplex (forced) → 100 Megabit half duplex (forced)
- Buttons: View port configuration, Confirm changes
- Action 3: **3. Cycle port on switch**

Bottom Screenshot: "Unplanned low power mode"

- Alert: **Unplanned low power mode** (Active)
- Time: Jun 9 2025 at
- Tab: **Suggested actions** (5)
- Text: These steps are prioritized, but can be done in any order.
- Actions:
 1. Cable test
 2. Check that LLDP is running
 3. Cycle port on switch
 4. Check PoE budget
 5. Run LLDP packet capture
- Warning: Certain admin privileges are required to perform this action. Please contact your admin or support team.
- Text: Run a packet capture to collect forensics of LLDP negotiation failures.
- Button: Run packet capture

RCA Framework features

- Automated RCA workflows eliminated unlikely root causes
- Support MS Switches for integrated remediations steps
 - Cable test
 - Switch port config check
 - PoE type check
 - Port cycle
 - LLDP packet capture
- 3rd Party switch LLDP Packet Analysis

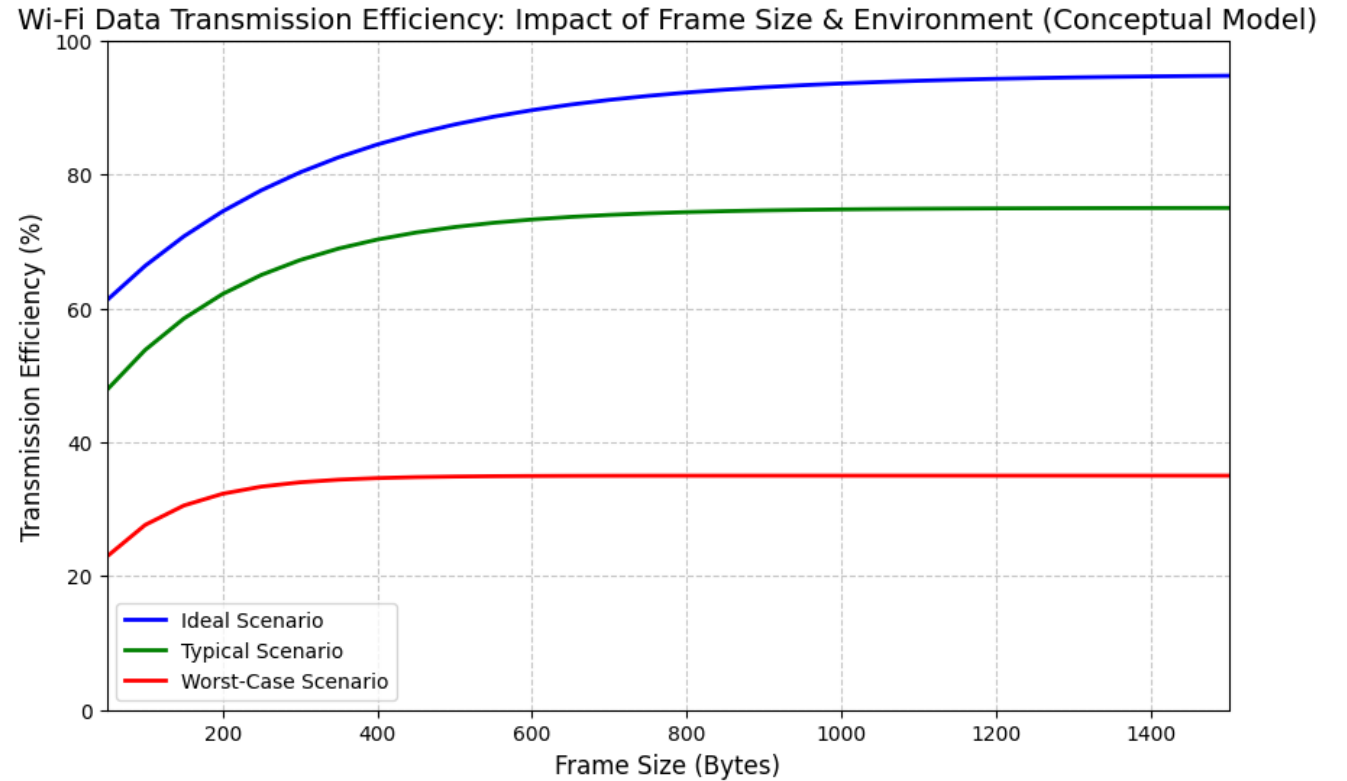
Demo – Device Assurance

RF Assurance

How's my Wi-Fi doing? It depends...

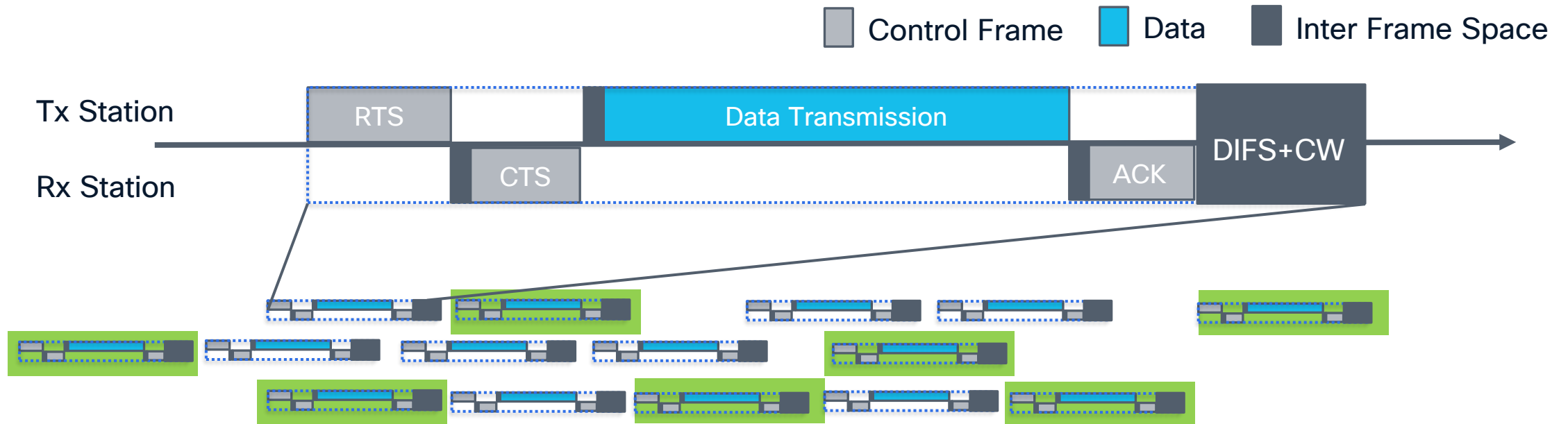
Wireless performance are depending on many factors as Wi-Fi relies on transport conditions and clients that are unique on each type

- Uncertainly of transport quality
- Over the air resource availability
- Varied client capabilities



Wi-Fi Performance is determined many factors and there is no single rule of thumbs

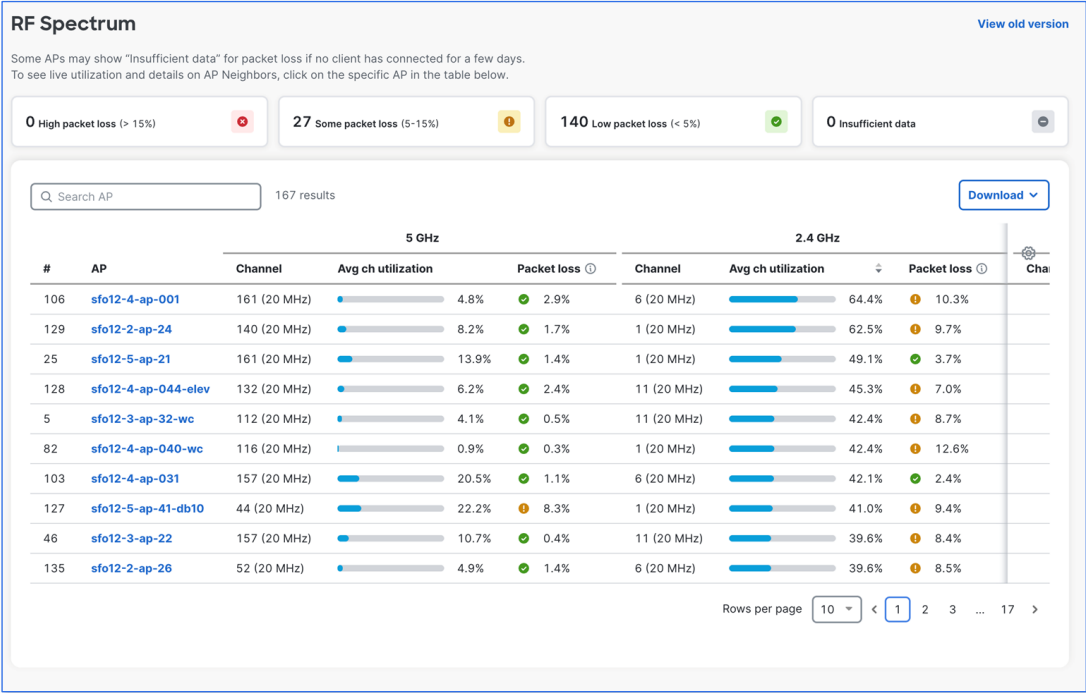
Wi-Fi designed to avoid collision, higher the Channel utilization goes, longer the waiting time has become



- Wi-Fi designed as CSMA/CA system – Carrier Sense Multiple Access / Collision Avoidance
- Half-Duplex system, Tx and Rx can't happen same time
- Overhead can be anywhere between 20% to 80%, average ballpark of 40-50%

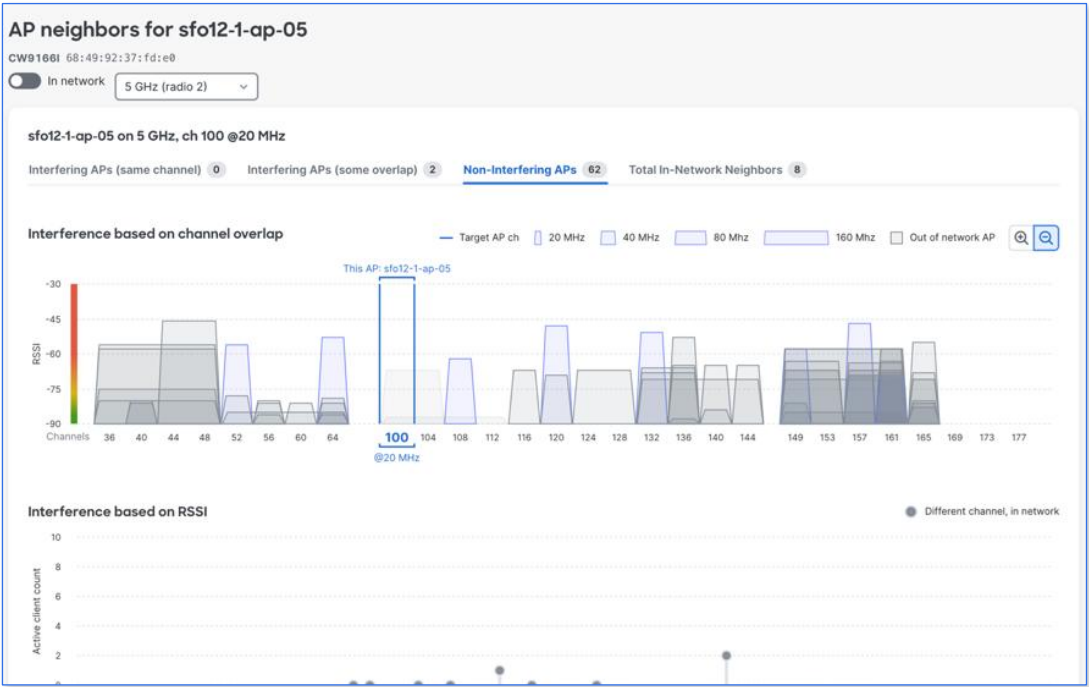
RF Spectrum evolved to provide both top-down discovery as well as bottom-up real-time RF neighbors

Long-term, trend-based Top-N list view



- Monitor RF Utilization and Packet Loss
- Proactive, discovery workflow to detect AP with persistent problem

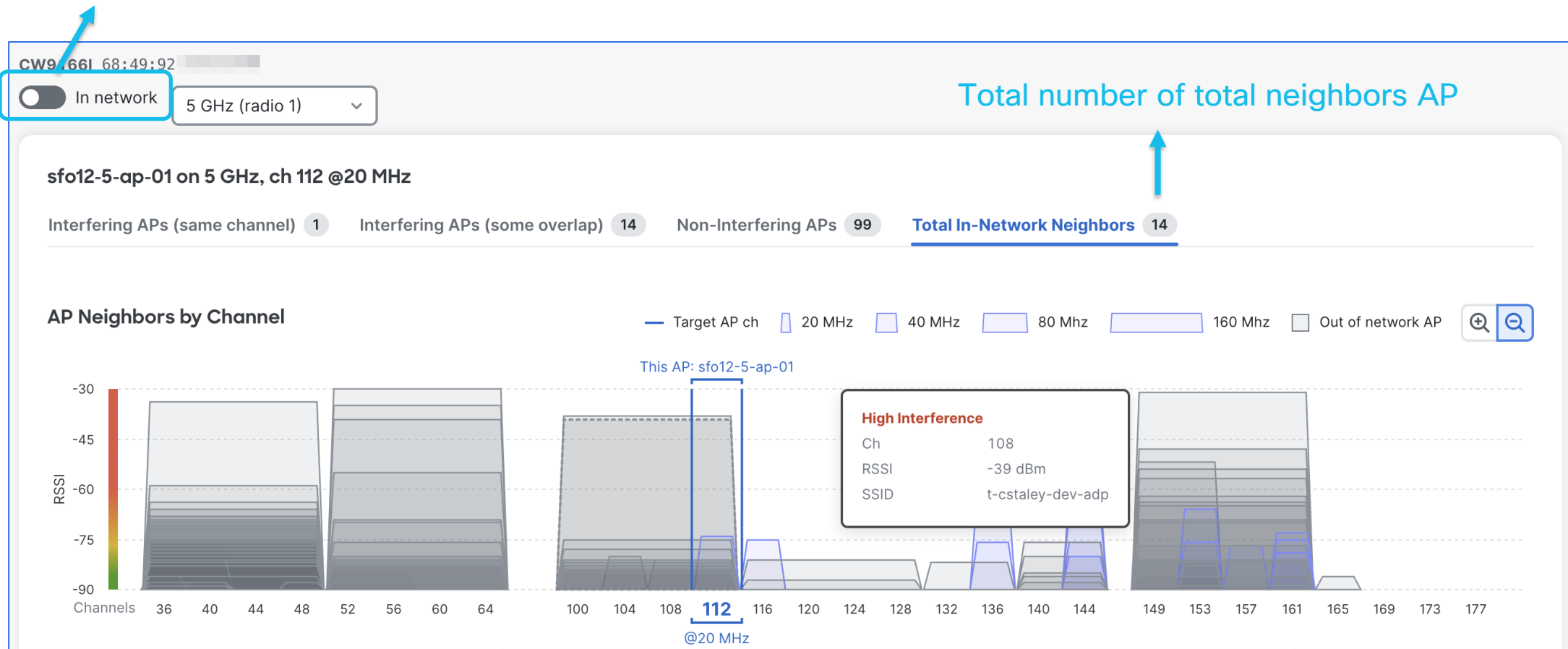
Real-time RF Neighbors



- Full-channels Wi-Fi analyzer while AP is in service using scanning radio
- Offers workflow from RF health and RF overview list

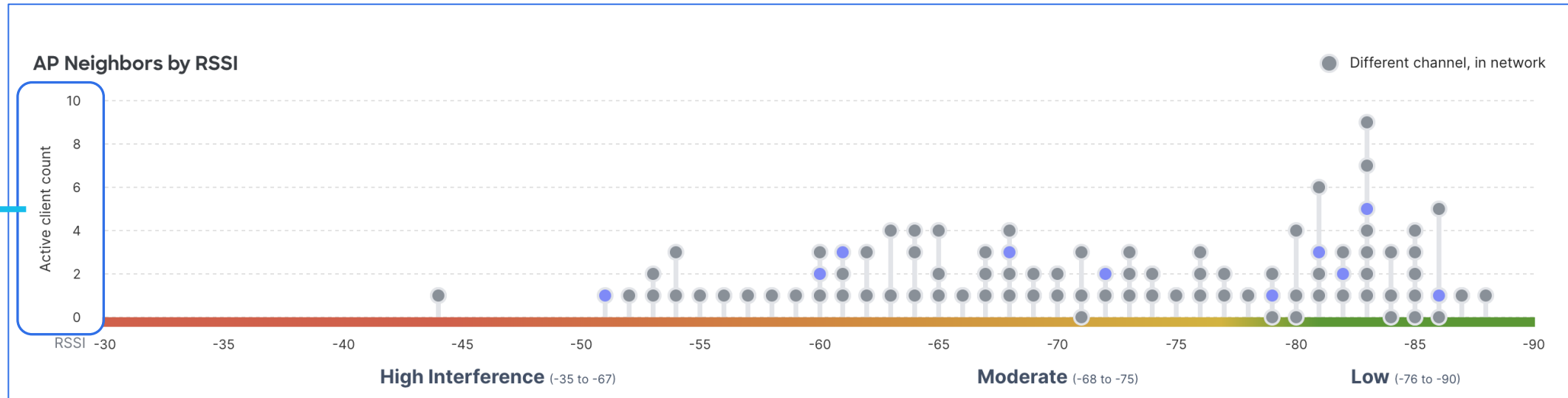
AP neighbor view makes remote troubleshooting easy and powerful – Whole band scanning and real-time updates

In network toggle to enable/disable neighboring, out of network APs/BSSIDs



AP neighbor view makes remote troubleshooting easy and powerful – AP Neighbors by RSSI

Shows neighboring APs with active clients



- Lists all neighboring APs from current radio
- Not a rogue AP view
- Showing all APs across band
- Client counts shows possible channel consumption contributions

- Lists all neighboring APs from current radio
- Not a rogue AP view
- Showing all APs across band

AP neighbor view makes remote troubleshooting easy and powerful – AP Neighbors by RSSI

These three tabs are available from In-Network APs

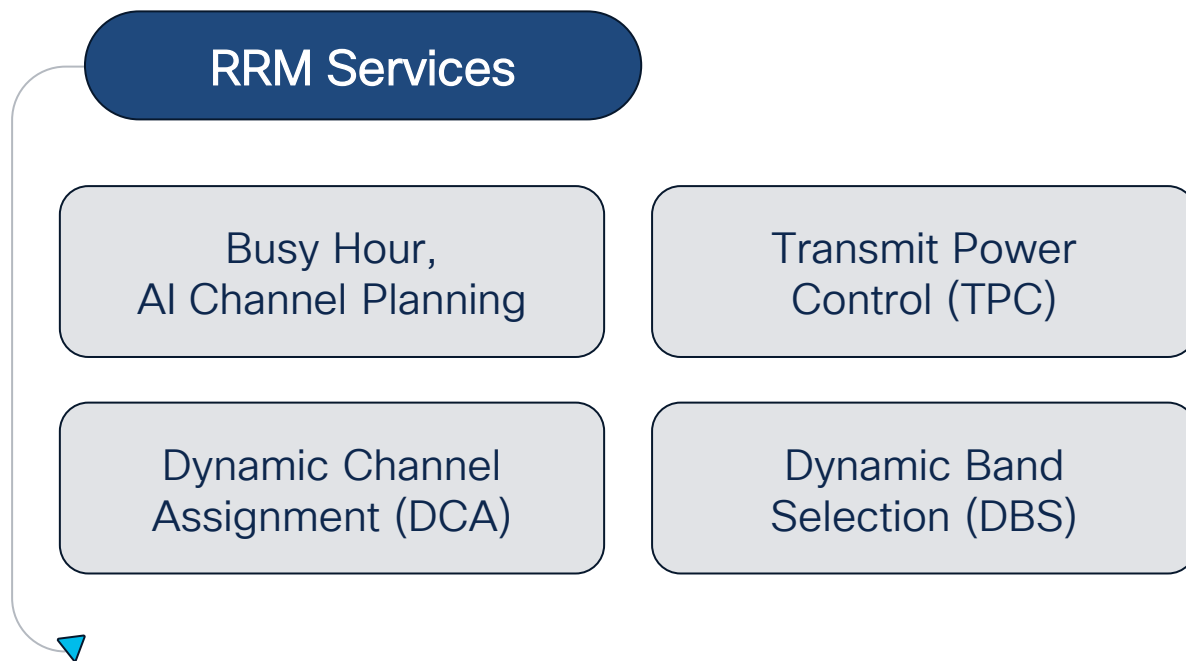
#	Interference	AP neighbor		RSSI (dBm)	Ch	Ch utilization	Active clients	Tx power (dBm)	SSIDs
1	✓ None	32:8d:cb:b3:fa:5c	<div><div></div><div></div></div>	-30	52 (80 MHz)	—%	0		erich_mr
2	✓ None	8e:15:54:ab:ac:5c	<div><div></div><div></div></div>	-31	149 (80 MHz)	—%	0		t-whauser-brid, t-whause
8	✓ None	0e:8d:cb:6d:f2:f2	<div><div></div><div></div></div>	-54	153 (80 MHz)	—%	0		KEITH_SFO12_MG_WORKBENCH WiFi
9	✓ None	b2:88:91:51:47:a0	<div><div></div><div></div></div>	-54	153 (80 MHz)	—%	0		COPY THIS NETWORK - wireless WiF
10	✓ None	a6:18:98:00:fb:2a	<div><div></div><div></div></div>	-59	44 (80 MHz)	—%	0		devel 3 - wireless WiFi
11	✓ None	sfo12-5-ap-02	<div><div></div><div></div></div>	-61	136 (20 MHz)	5.4%	1	5	Meraki-Corp, Meraki-Guest, avalanche_openroaming, blizzard
12	✓ None	sfo12-5-ap-07	<div><div></div><div></div></div>	-62	144 (20 MHz)	9.11%	0	5	Meraki-Corp, Meraki-Guest, avalanche_openroaming, blizzard

Interferences type - ! Overlapping ✖ Same ch ✓ None

Multiple BSSIDs from same AP are combined

What is radio resource management?

RRM is a Radio config optimization features that constantly update wireless's RF configurations to improve wireless performance.

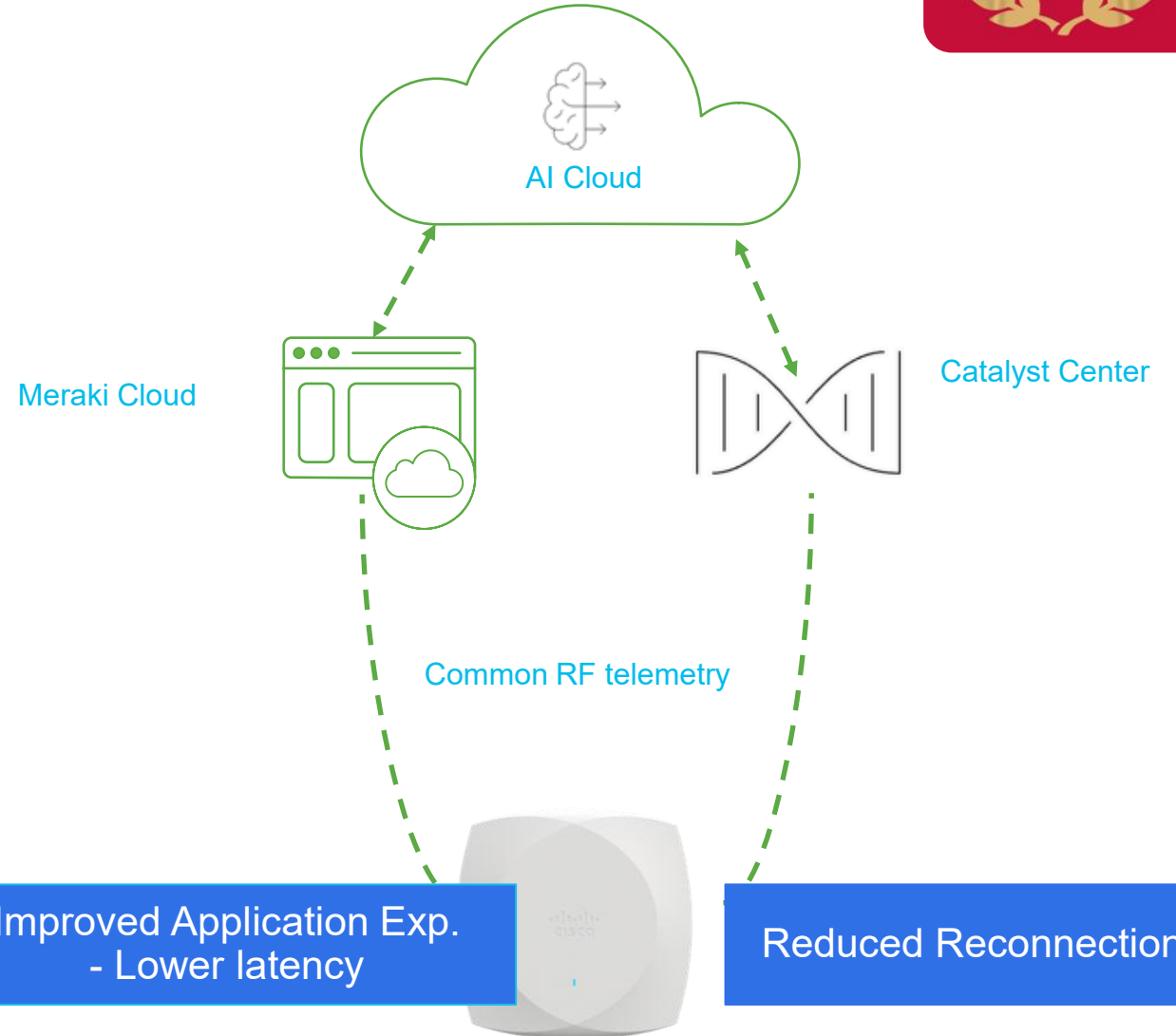


First Unified AI Wireless Service – AI-RRM

Path to autonomous Wi-Fi

RF Intelligence powered by the unified AI cloud

- Interferences reduction
- Reduced Channel Changes
- Client Experience Improvement
- Wi-Fi Performance Improvement



AI-Enhanced RRM key customer benefits

Better RF, better insights, reduced operational costs and time

AI-driven self-optimizing RF

Leverages machine learning to find patterns and optimize your RF before issues happen.



Measured Improvements in RF KPIs!

- CCI Reduction: Up to 40%
- SNR Downlink Gain: Up to 7 dB
- RRM Changes Reduction: Up to 75% at busy hours

Performance visibility

Provides per-building visibility into RF health using Wireless Config Analyzer algorithm.

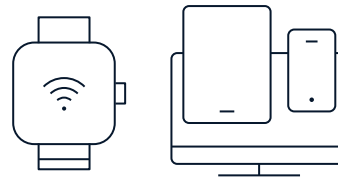


Actionable insights

AI-derived recommendations on RRM setting changes for a more optimal performance.

Complete historical context

Understand exactly what RRM changes occurred at a per-AP level, and how they benefit the network.

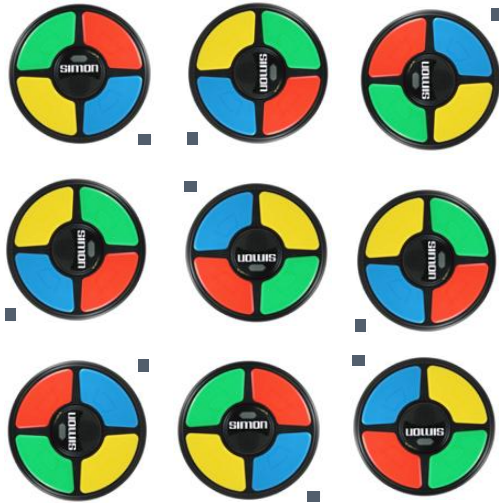


Simplified RRM configuration

Complicated traditional RRM configurations are simplified, with policy toggles and thresholds.

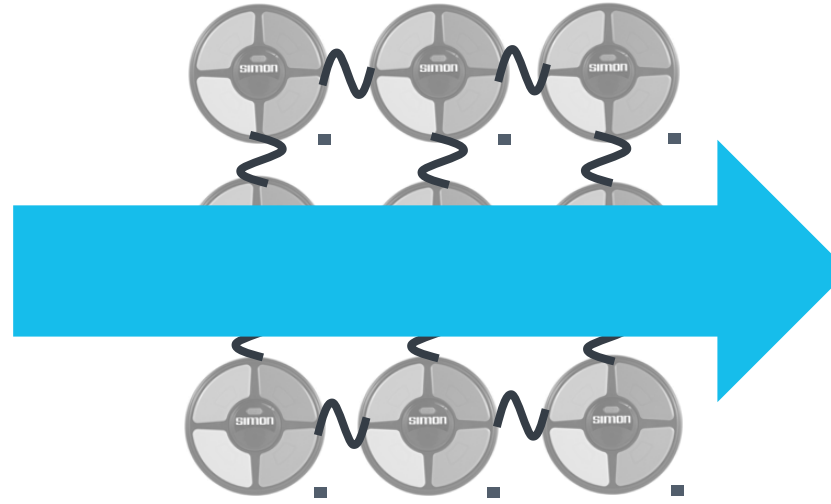
AI-RRM leapfrogs decades of innovations

Gen.1 Per-AP RRM



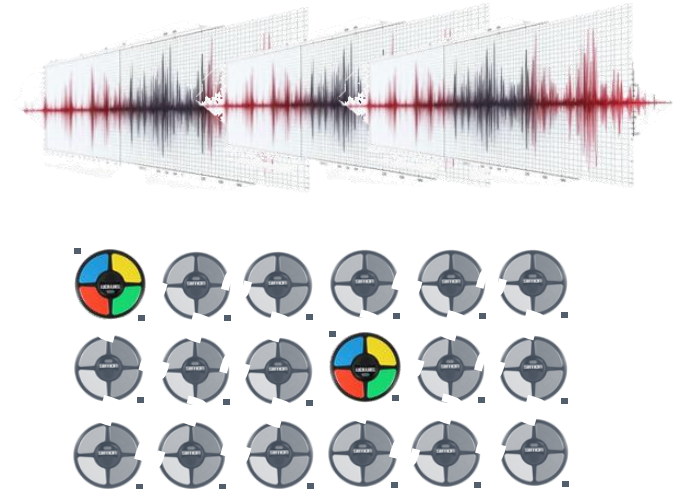
- Each AP makes own RF changes independently, at own timing
- Cascading RF changes could introduce infinite change-loops

Gen.2 Snapshot RRM



- All APs in the same building (RF group) makes RRM decision all at once
- No cascading effect
- 10~15min, short scanning duration for RF change

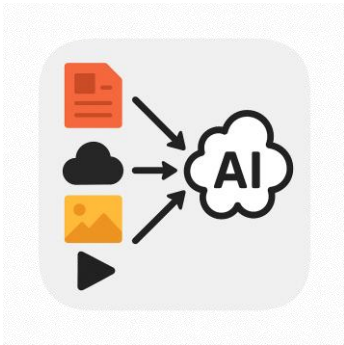
Gen.3 Trend-based, AI-RRM



- Long-term Trend-based RF telemetry pre-processing
- Minimal RF change from AI Busy Hour
- AI-RRM Dashboard

AI-RRM AI process pipelines

Multi-type data Ingestion



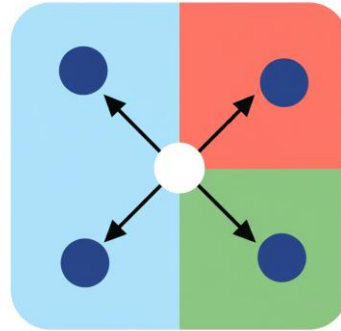
- AP Device Info
- RF Config/Profile
- RF Neighbor info
- Client Telemetry
- RF Events

Normalization



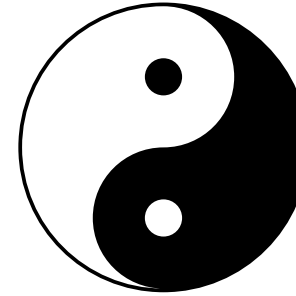
- Baselining
- Remove transient event
- Minimum 2 week of RF telemetry data

Classification



- KNN Classification
- Identify Busy Hour
- Apply different RF optimization weights by busy or non-busy hour
- Per-Network model

Reinforced Learning



- Feedbacks from RF Score
- Updates AI-RRM model using RF evaluations outcome
- Automated & RLHF

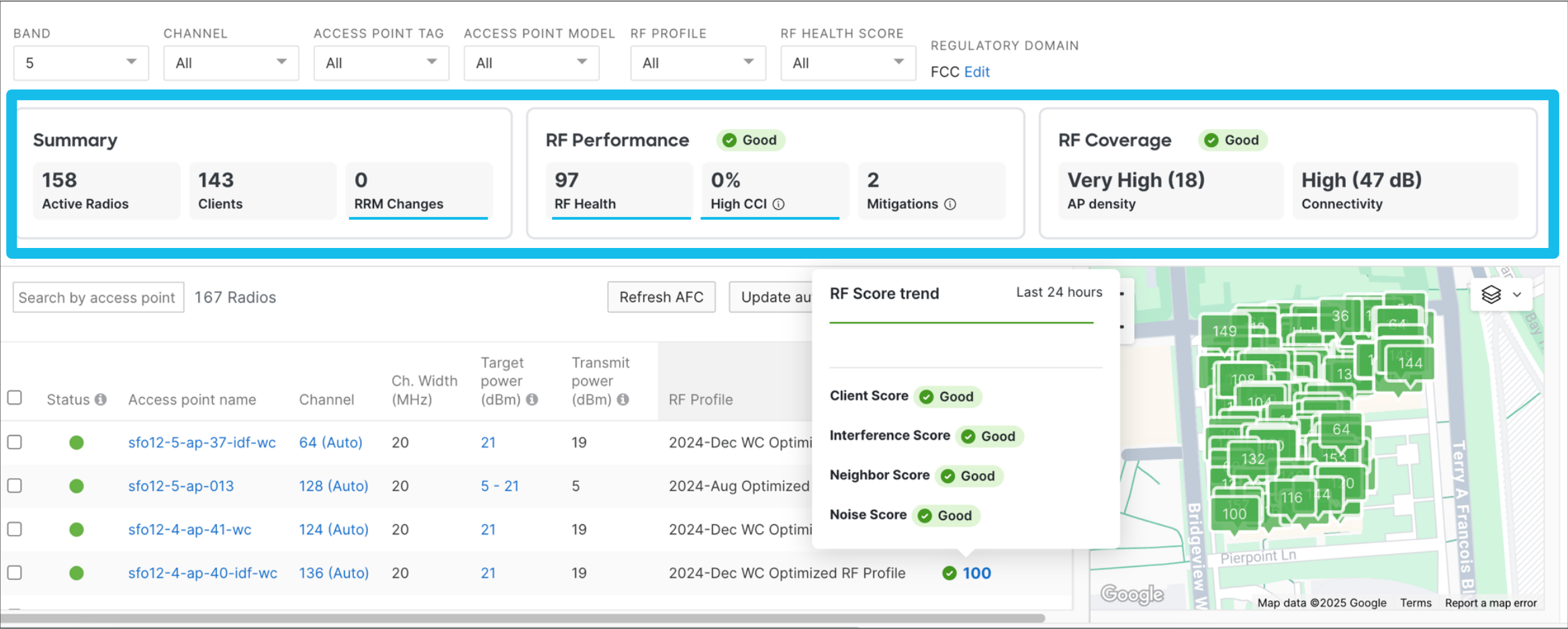
Digital Twins



- RF Simulation using Digital Twin
- “What if” results on updated RF config recommendations

Closed-loop RF configuration and optimization with AI Insight

Connected workflow of radio configure, assess and optimize

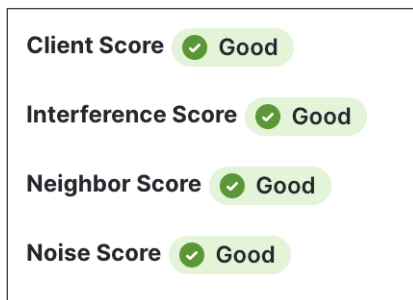


What defines better Wireless Network from the RF Point of view



RF Health

- RF Health algorithm debuted 2018 by Javier Contreras, Principal Engineer from Cisco.
- RF Health calculated from 9 RF metrics, takes worst score from which ever metric – Neighbor, Interference, Noise and Client



Co-Channel Interference

Interference can make your Wi-Fi slow or unreliable. AI-RRM calculated below factors

- Impact Score
- Highest CCI dBm
- Duty Cycle from Interferers

✓ Good

0%
High CCI ⓘ



Channel Changes

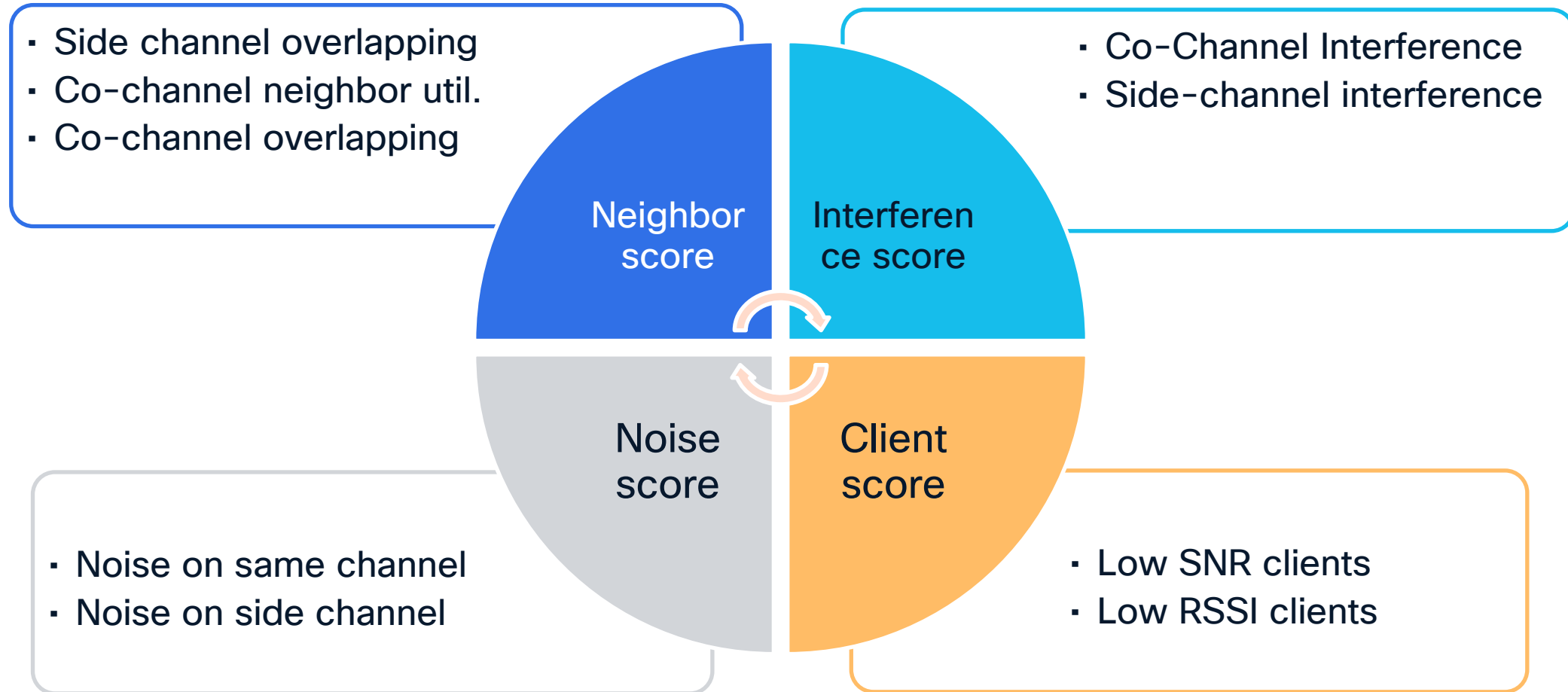
When AP changes channel, client can follow new AP channel if it supports 802.11h (CSA) and on 5GHz SSID.

If client doesn't support 802.11h, client may experience network delay or disruption

Minimize Ch. Change will avoid sudden wireless connection disruption or delay

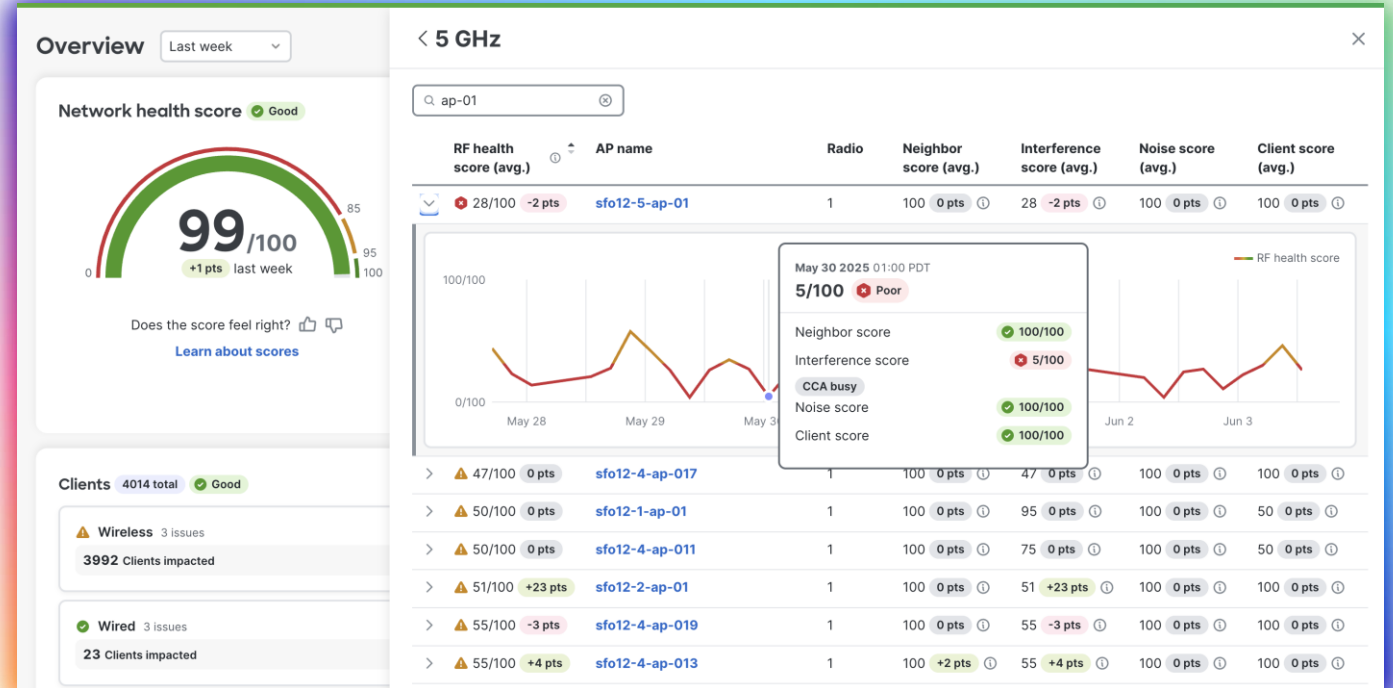
0
RRM Changes

RF Health – Barometers for Over-the-Air RF Spectrum quality assessment tool



RF Health – Always On Wi-Fi Audit

- Highlights problematic band and point in time view, identify what's the persistent or transient issue
- Provide per-radio RF scoring, the same algorithm used for AI-RRM
- Provides further scoring and insights on critical RF categories –neighbors, interference, noise, and client connectivity



Discover source of interferences and quantify the impact

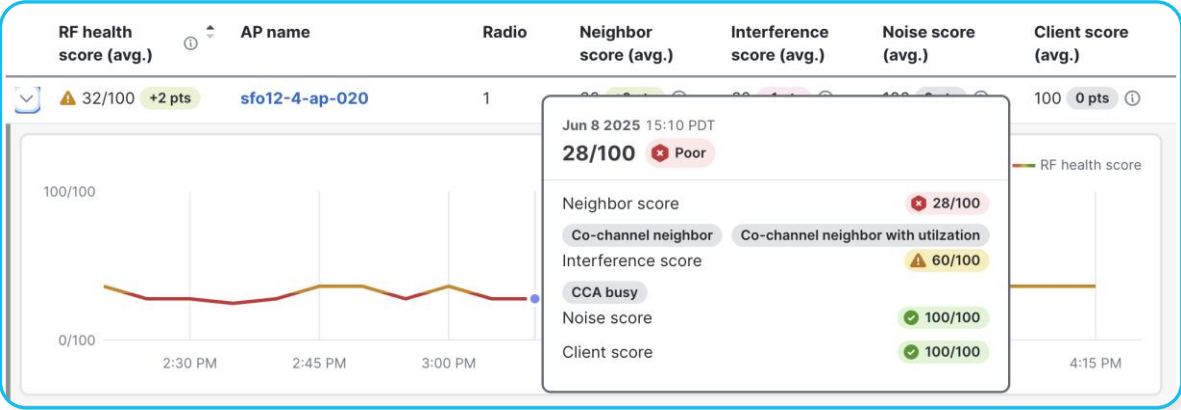
RF Settings/ Overview



Health score tier

- 61– 100 : Good
- 31– 60 : Fair
- 0– 30 : Poor

Assurance Overview / RF Health

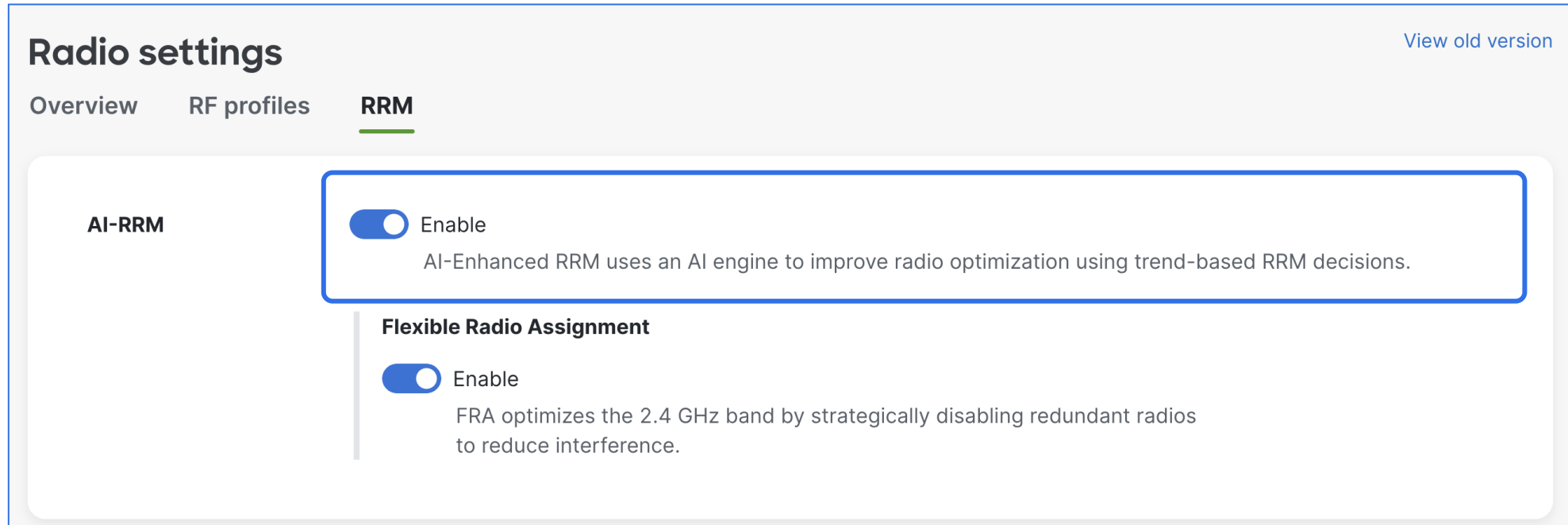


Most common RF score impacting KPI

Reason	Causes
Co-channel neighbors	High channel reuse
Co-channel neighbor with utilization	High ch. reuse with busy neighbor AP
CCA Busy	Too many Rogue APs

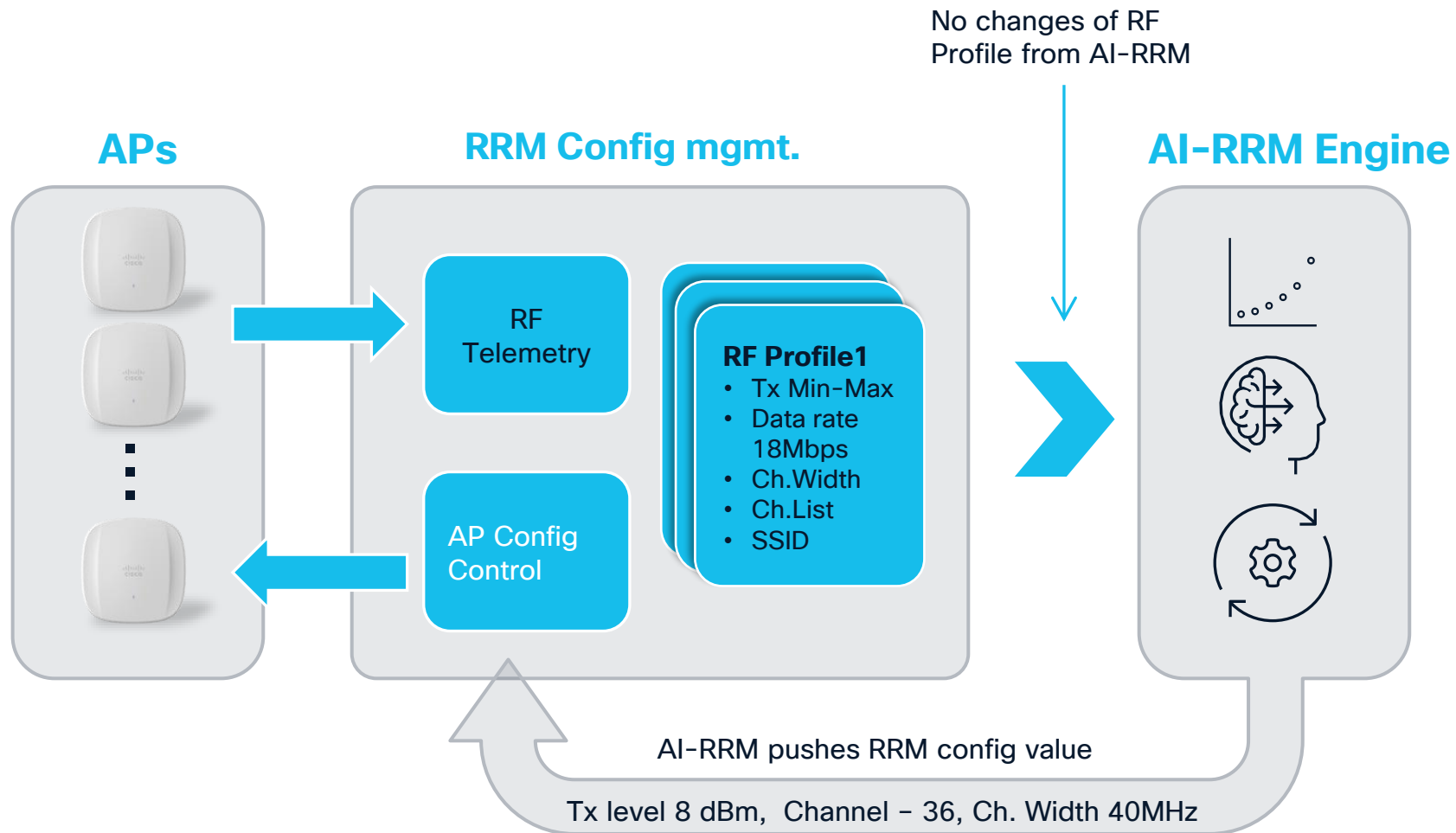
AI-RRM UX/UI Principal

Insanely Simplified, seamless RF Brain transplant



- Just one click to turn on AI-RRM
- Keep Everything else – RF Profiles or any other existing configs “as-is”
- No separate config page or changes required.

AI-RRM provides superior RF outcome



- No Changes in the existing RF Profile
- AI-RRM optimize RF configuration within the RF profile policy
- RF Health and performance evaluation will happen all the time
- Unlikely scenario, AI-RRM service failure, RF optimization will fall back to traditional RRM

AI-RRM vs. RRM networks

AI-RRM uses x1,344 times longer RF statistics to determine next best channel

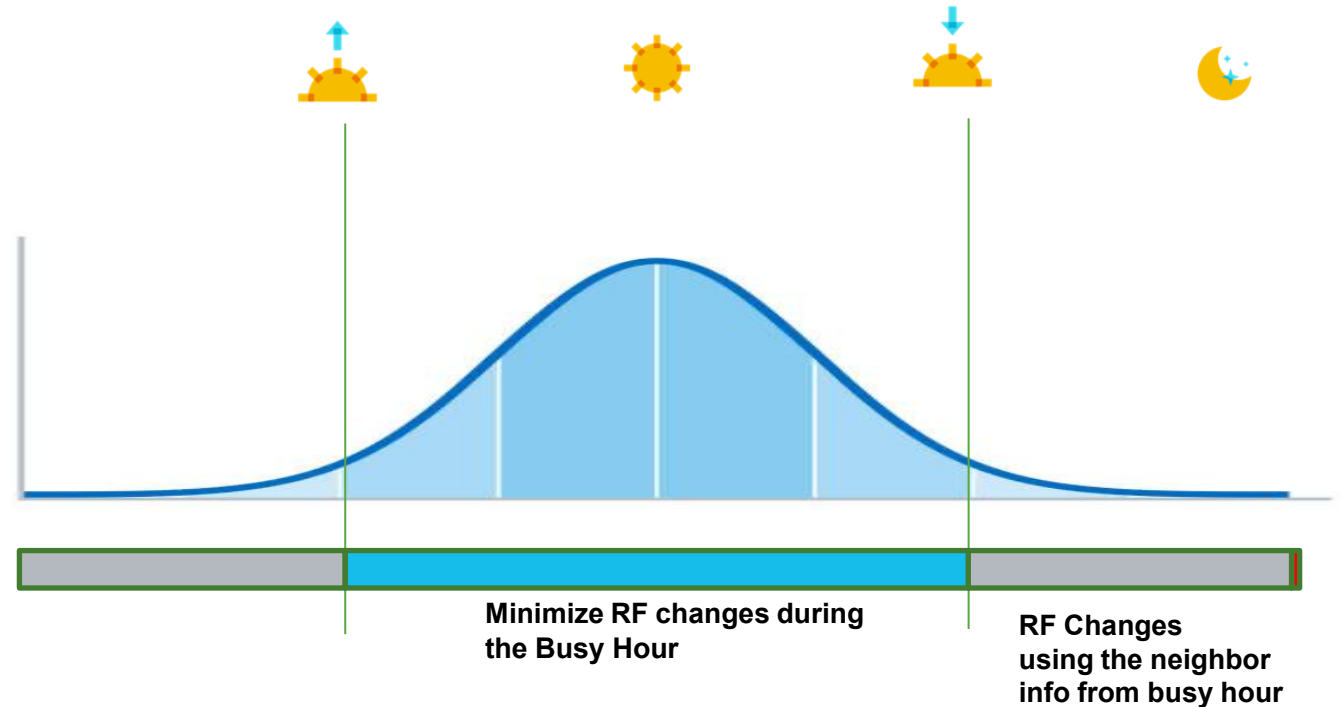
	RF config model	Base RF Optimization	Base RF Optimization duration	Advanced Optimization	Assurance	Architecture	License Tier
AI-RRM	RF Profile	Trend-based	2 Weeks = 20,160 min	<ul style="list-style-type: none">Enhanced Busy HourAI Channel PlanningFlexible Radio Assignment	<ul style="list-style-type: none">RF HealthRF DashboardBefore-After analyticsPeer Comparison	Unified AI-RRM Cloud	<ul style="list-style-type: none">MR-ADVAdvantage Subscription
RRM (autoRF)	RF Profile	Snapshot-based	15 min	<ul style="list-style-type: none">Busy HourAI Channel Planning	<ul style="list-style-type: none">RF Health	Meraki Cloud hosted	<ul style="list-style-type: none">MR-ENTEssential Subscription

- RRM and AI-RRM uses common RF Profile configuration
- Switching between AI-RRM and RRM happens seamlessly
- AI-RRM services is available for MR-ENT customers as a trial services

Minimize Channel-Change in Busy Hour

AI Busy Hour

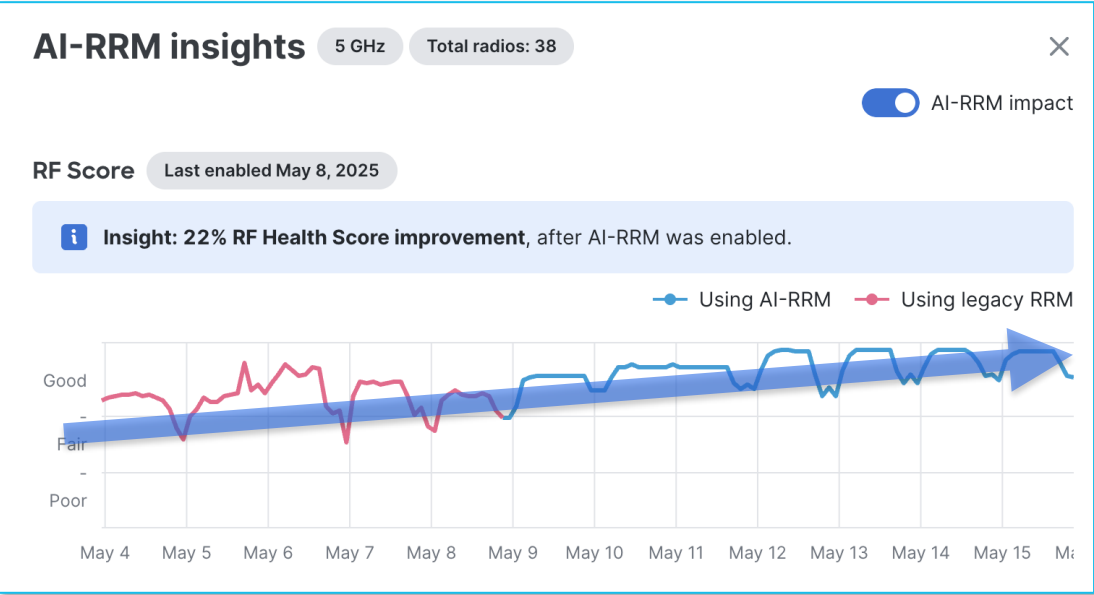
- Busy Hour can be either automatically or manually configured
- Every Changes are done off hour, using busy hour data.
- Avoid client disconnection or roaming due to channel change



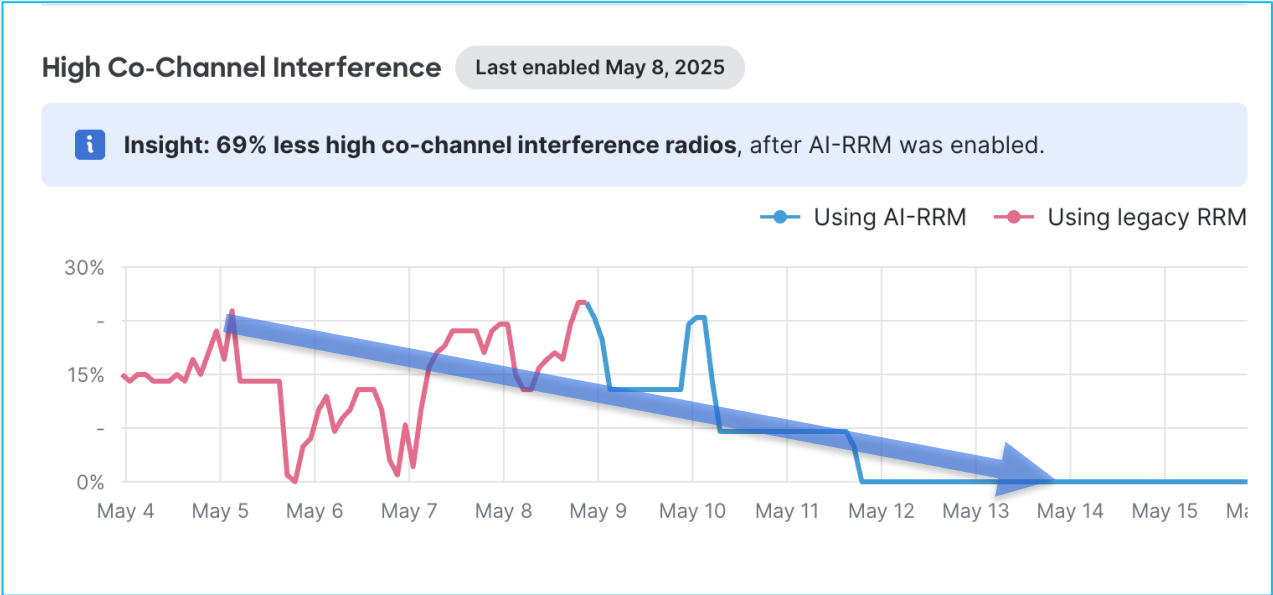
AI-RRM Before & After – Measurable AI Advantage

Typical Network examples with medium network density – (AP Density of 9)

+22% RF health score improvements



-69% less High Co-Channel Interference

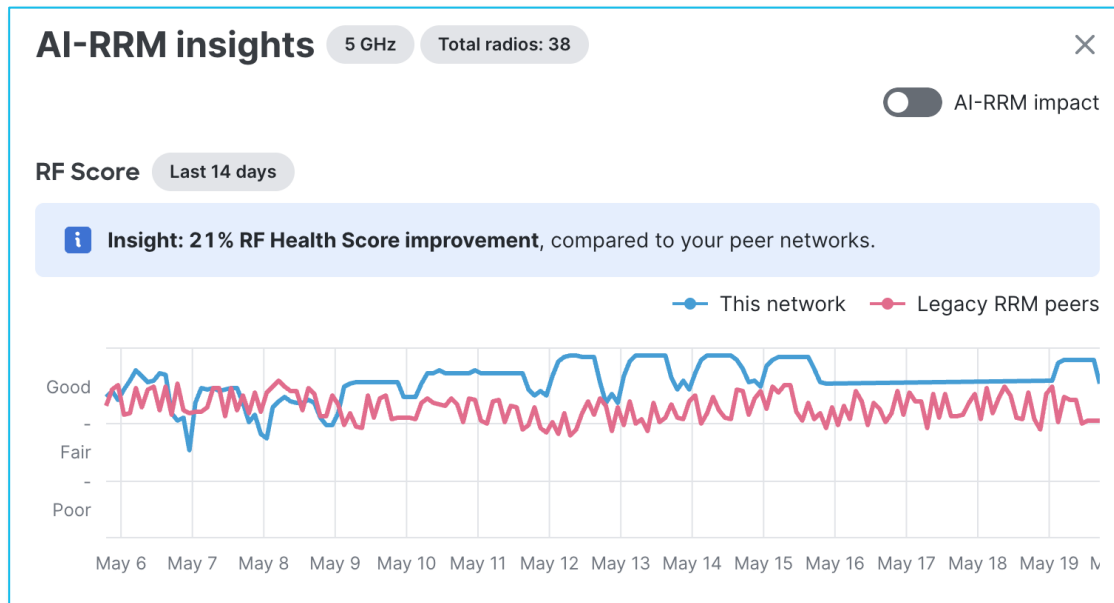


- Red Before AI-RRM gets enabled, using legacy RRM (autoRF)
- Blue After customer enabled AI-RRM

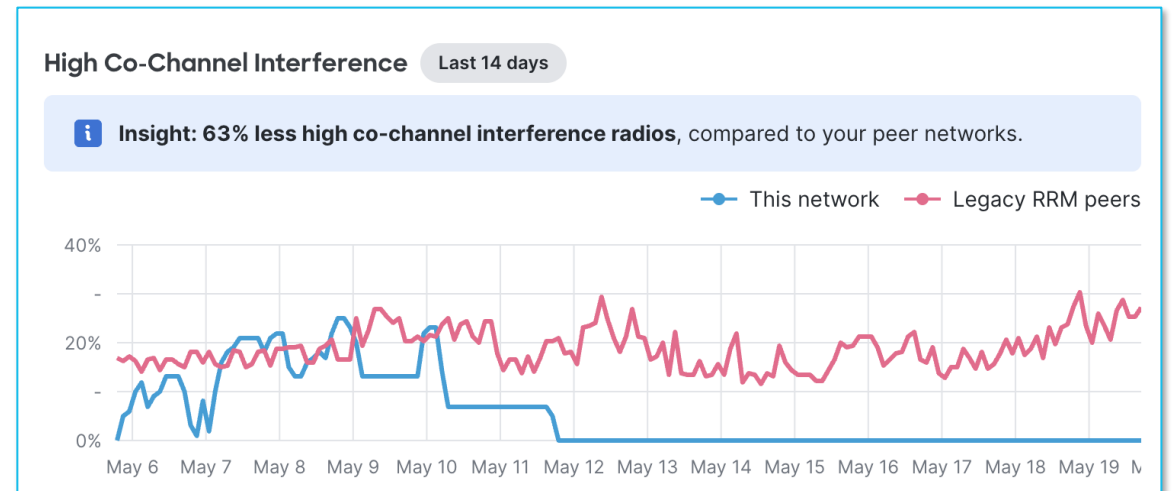
Comparison with peer networks that has same AP density as my network

Typical Network examples with medium network density – (AP Density of 9)

+21% RF health score improvements



-63% less High Co-Channel Interference



Red

Before AI-RRM gets enabled, using legacy RRM (autoRF)

Blue

After customer enabled AI-RRM

Demo – RF Optimization

Hitless FW Upgrade

Intelligent Firmware Rollout

Continuous monitoring to ensure quality for customer deployments



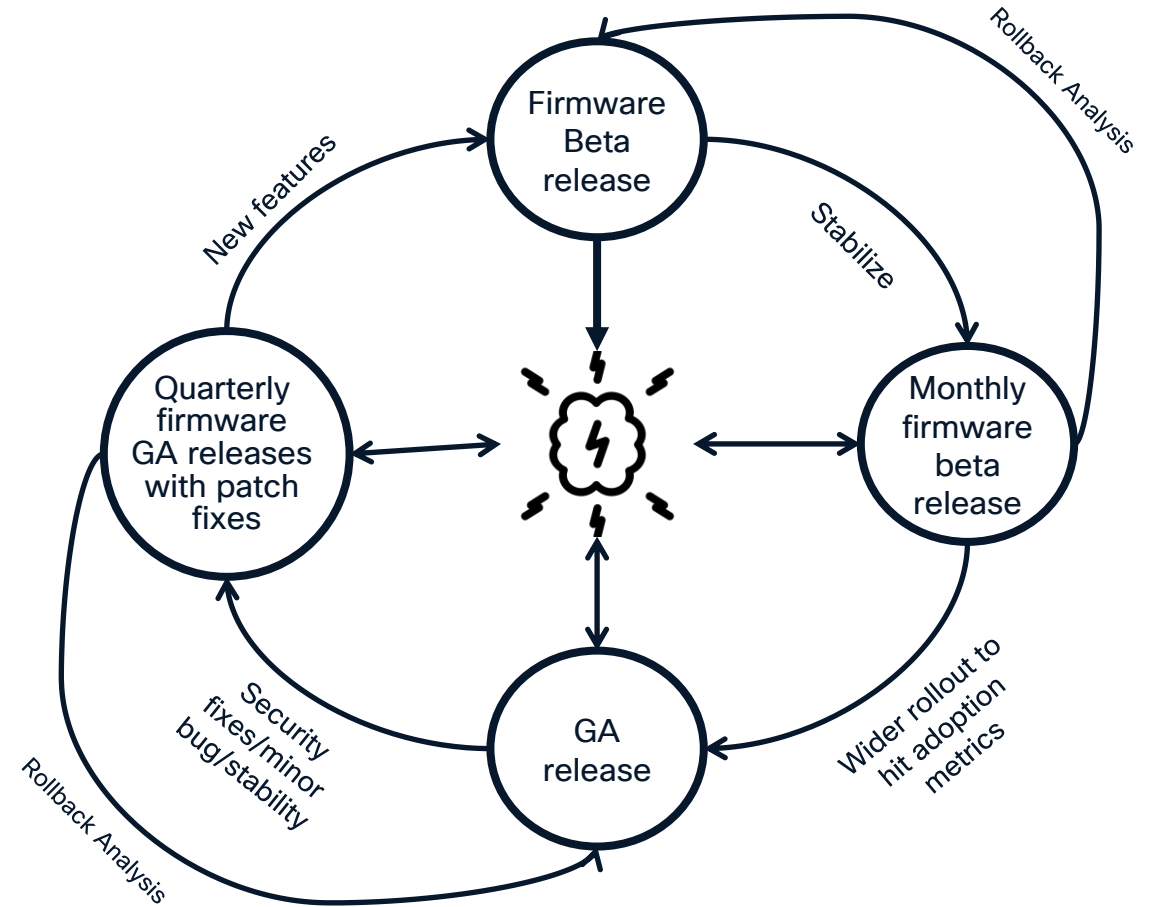
Global monitoring
for all deployed firmware



Proactive monitoring
for product stability



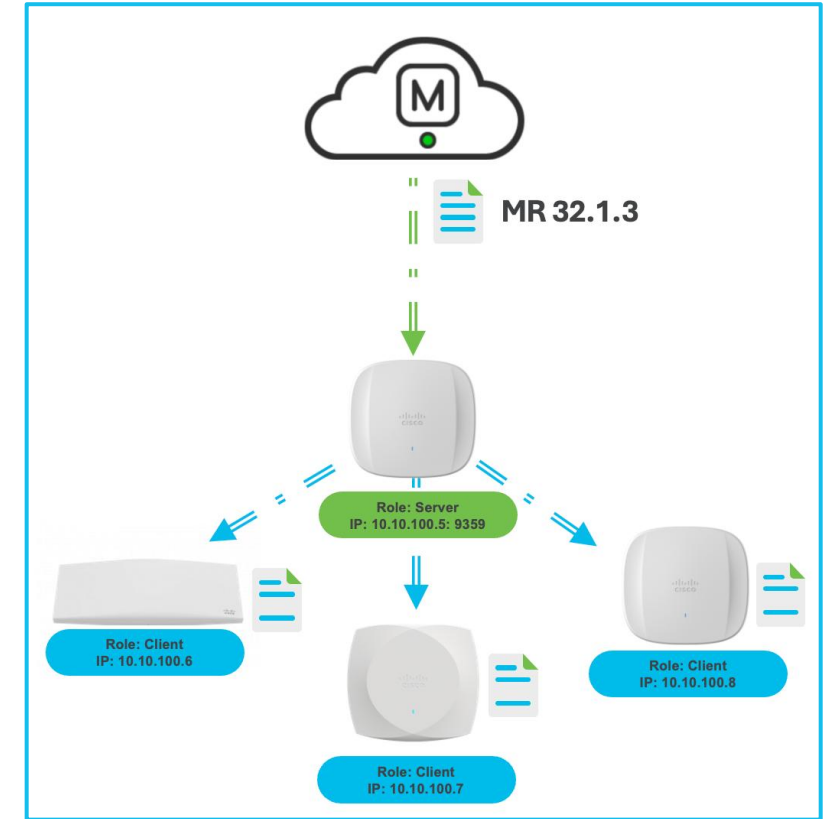
Proactive outreach
to resolve issues



Local Firmware Fetch

Reduce AP Firmware upgrade time by 10x

- Smart Firmware Rollout
- AP Image pre-download
- Automated or Scheduled
- WAN Bandwidth Optimization
- Download AP FW only once per AP, per network
- Avoid downloading same images over the internet dozens to hundreds of time.
- Schedule FW download on non-business hour
- Minimize Maintenance Window
- Reduce the total time to upgrade from few hours to few mins
- Use Smart Firmware Upgrade to automatically cherry pick AP upgrade target



Reduce AP Firmware upgrade time to x10 to x20 times!

Hitless Software Upgrades

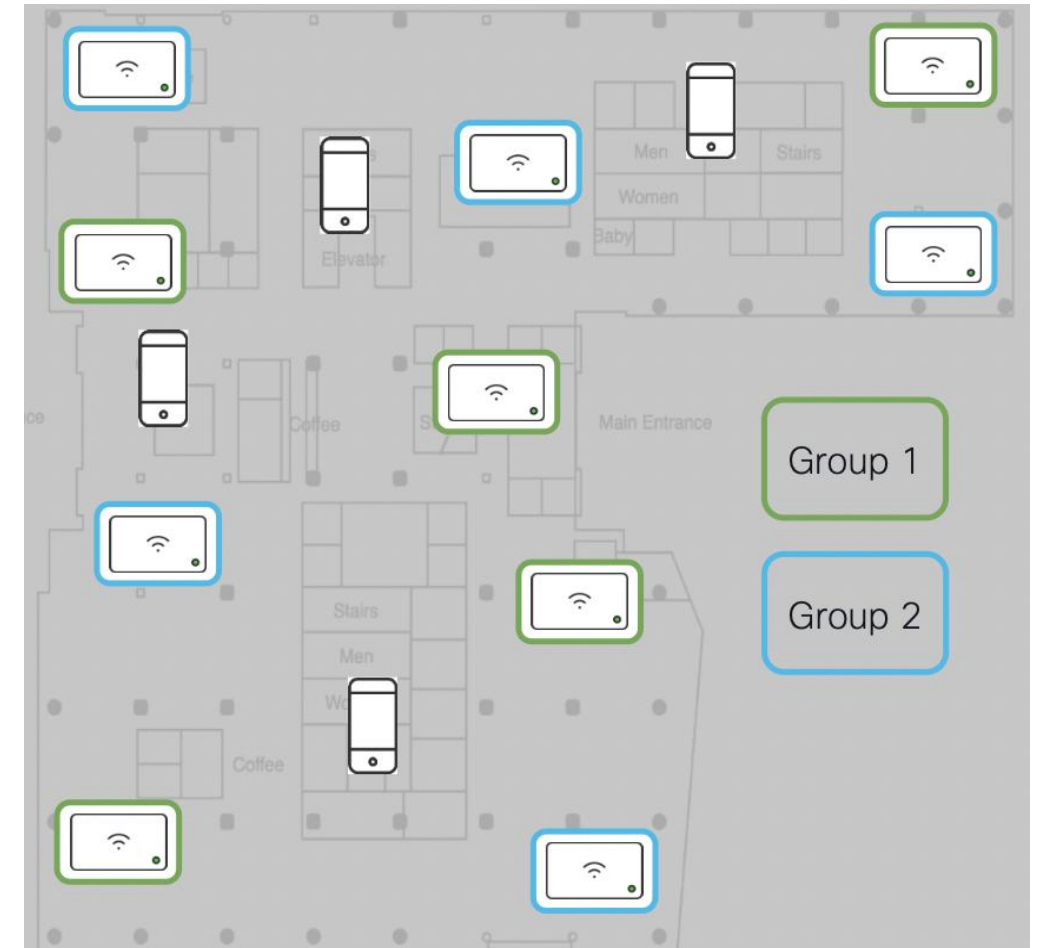
Multi-group Salt-Pepper AP Reload

Any downtime, even if planned, disrupts 24/7 operations and impacts user experience.

- **Upgrade Hold Control**
APs download but pause upgrade until the dashboard triggers the final step, ensuring they remain in service until safe.
- **Overlap Detection**
Groups APs based on overlapping coverage, ensuring at least one AP can always serve clients.
- **Smart Scheduling**
Upgrades APs with the fewest clients first and only when coverage is guaranteed, minimizing forced client roams

Upgrade strategy

- ☐ Minimize total upgrade time
Meraki will minimize the total upgrade time by upgrading as many access points as possible simultaneously. This may result in clients losing connectivity while the upgrade is taking place.
- ☒ Minimize client downtime
Meraki will try to ensure that most of the wireless clients stay connected during the upgrade by avoiding upgrading adjacent access points simultaneously. [Read more](#)



AP Refresh/Deployment

AP provisioning steps for replace/upgrade case

Existing AP Refresh workflow



1. Claim new AP
2. Search claimed AP's installed network
3. Manually assign AP to right network
4. Go to old AP detail page, rename previous AP to old_AP Name
5. Search newly added AP, go to new AP detail page, change default AP to planned AP name
6. Add Tags to AP to assign SSID
7. Go to Configure>RF setting, Assign RF profile to newly added AP
8. Remove old AP from the network
9. Unclaim old AP from inventory to not waste cloud license
10. Connect AP to the network, wait for AP to come up online (DHCP, Cloud connectivity, FW updates)
11. Place AP to the floor using AP auto locate and/or third-party tool (e.g. Ekahau, Hamina)

Repeat all steps for each new AP installation - 100s to 1000s times per network

New - AP Zero-Touch Refresh

Green Field

- Bulk AP provisioning workflow
- Bulk provision via CSV & API
- Complete pre-provision prior to physical installation

Brown Field

- Auto network assignment
- Migrates AP configs to new hardware

The screenshot displays the Meraki dashboard's 'Inventory' section, specifically the 'AP Auto Deployment' workflow. A notification at the top states: 'There are 20 APs ready for network assignment. There are 10 new APs awaiting deployment and there are 10 existing APs requiring refresh.' Below this, the 'AP Auto Deployment' section is active, showing 'Deploy New APs: 10' and 'Replace Existing APs: 10'. A table lists 10 items, all of which are 'Existing APs' (CW9166) and are selected. The 'Existing AP action' column shows 'New AP' for each item. The 'Status' column shows 'Existing AP action'. The 'Date added' column is empty. A 'Provision selected APs' button is visible. Below the table, the 'Provision New APs' section is shown, with a 'Configure APs' table. This table has columns for 'MAC address', 'Serial number', 'Network', 'AP name', and 'Tags'. The 'MAC address' column contains the value '3C:6F:ED:04:C0:5E' for all rows. The 'Serial number' column contains the value '9XJ2-KL8M-3TQY' for all rows. The 'Network' column has a dropdown menu with 'LAX' selected. The 'AP name' column has a dropdown menu with 'LAX-AP-01' selected. The 'Tags' column has a dropdown menu with '2 Tags' selected. An 'Apply to all' button is visible at the bottom right of the table. A tooltip on the right side of the table states: 'Clicking "Apply to all" will copy the data in the first row to other subsequent rows, including modifying the AP name with a number appended.'

Reduces upgrade time and costs with workflow

Simplified AP Provisioning process

New! AP Refresh workflow



1.Claim new AP

Just confirm the AP config migration with a single click

10.Connect AP to the network, wait for AP to come up online (DHCP, Cloud connectivity, FW updates)

11.Place AP to the floor using AP auto locate and/or third-party tool (e.g. Ekahau, Hamina)

Bulk AP provisioning, 1000s of AP configurations in just single click action.

Demo – AP Zerotouch Refresh

Cisco AI Assistant

- Wireless use-case

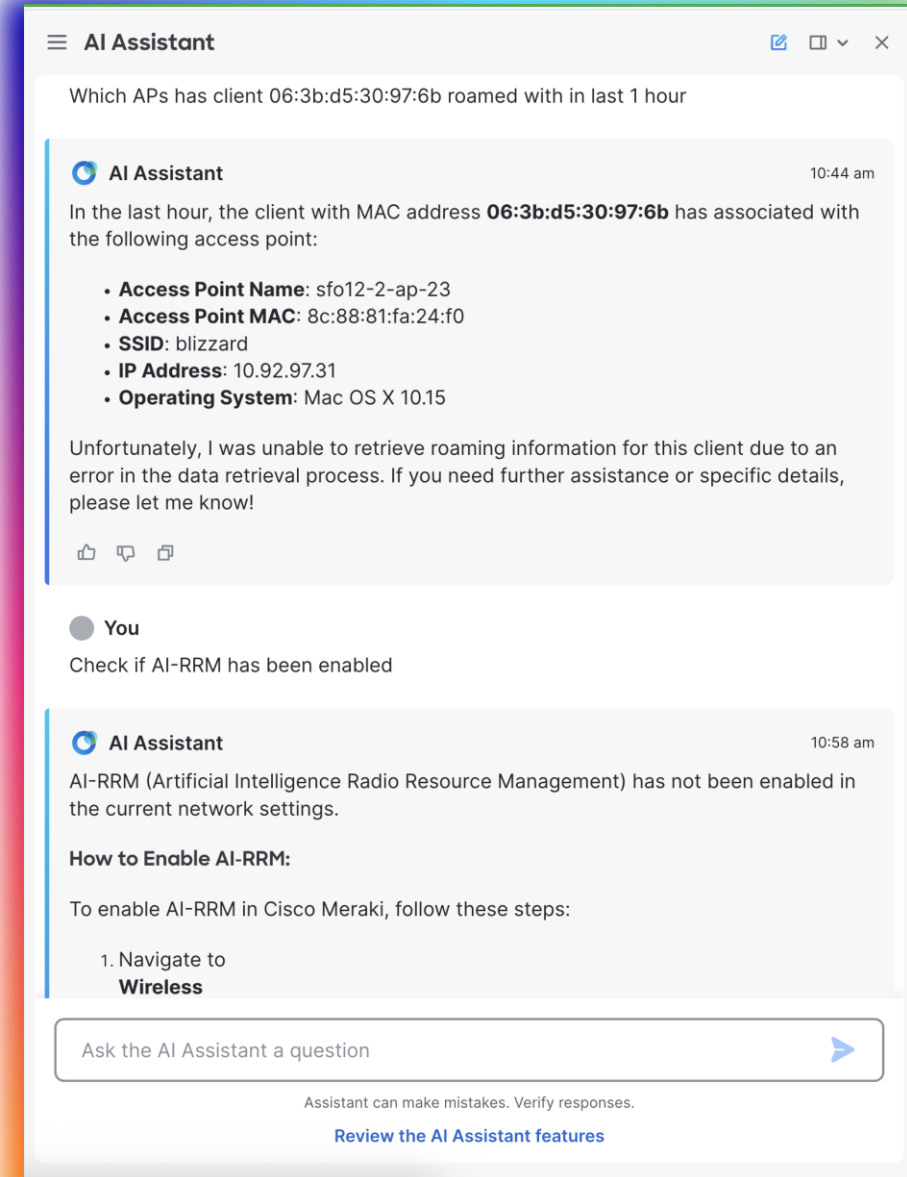
Cisco AI Assistant

Native, GenAI-based Agentic Network Interface

- Understand Wireless, Wired, WAN and Internet networking experience
- Understand unique network contexts such as Network Telemetry, Configuration, Firmware
- Answers dynamic network inquiries and answers
- Dynamic query parameter derivations and composite

Documentation and Best Practice Recommendations

- Acknowledge existing network configuration and provide the best practice network configuration



Cisco AI Assistant Use-cases

Top-down discovery

- Uncertainly to certain
- Proactive Discovery
- Org-wide or Network-wide inquiries and reply

Monitoring

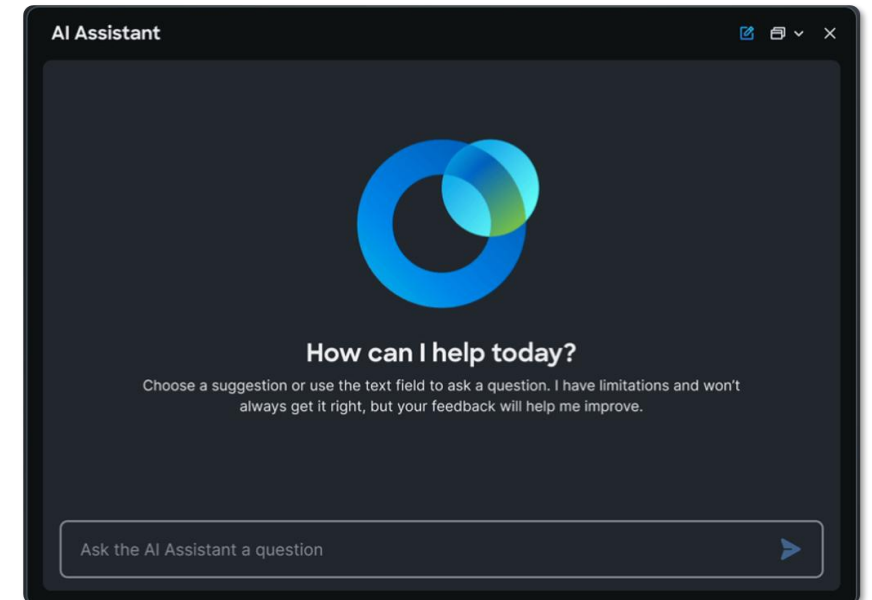
- Various quires and ad-hoc questions around all things such as inventory, device & Network configuration check, Firmware, device and client log, events, statistics and many more!

Bottom-up troubleshooting

- Notification Driven
- Client Troubleshooting
- Drill-Down deep into the RCA

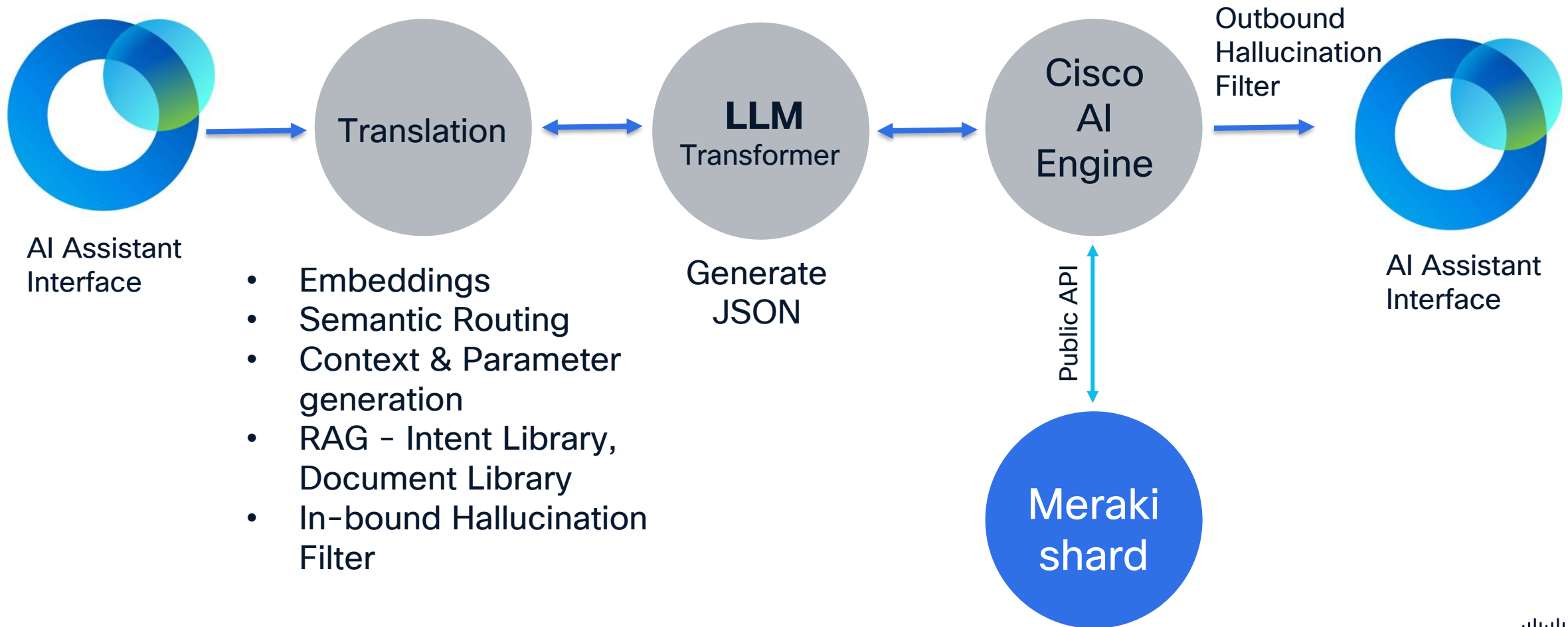
Configuration

- Guided workflows by Agentic Intelligence.
- Enable AI-driven multi-step and multi-system Workflows
- All based on Cisco's validated designs.
- Create a WLAN Network to RADIUS configurations



AI Assistant for Networking Architecture

In a nutshell

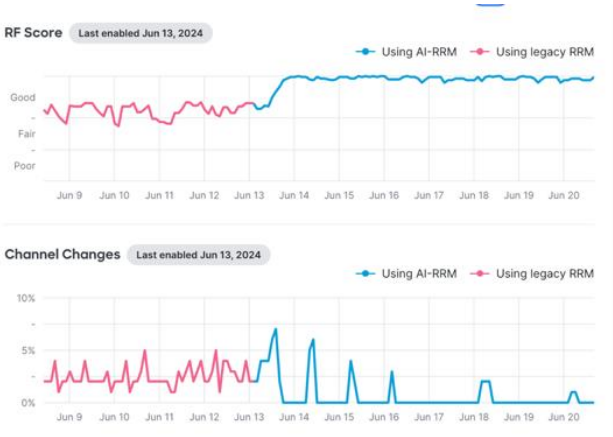


Demo – Cisco AI Assistant

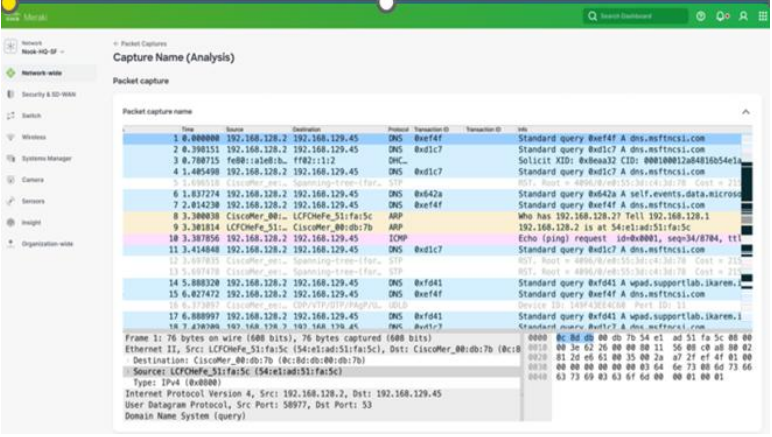
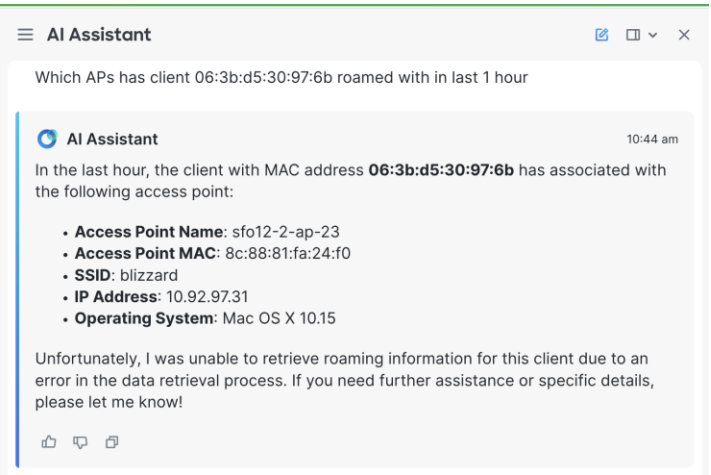
Wireless use-case

Conclusion

Conclusion: AI Wireless designed to offer productivity operation efficiency



Visible impact of Before & After AI-RRM



AI-RRM

- Using AI to tune and select channels best suited for your network
- Learning your network usage patterns to auto determine busy hours
- Optimizing to enhance client experience

Intelligent Captures

- Complex troubleshooting made simple
- Save expensive issue recreation cycles

AI Assistant

- Conversational Interface.
- Multi-domain Cisco AI Assistant

Complete your session evaluations



Complete a minimum of 4 session surveys and the Overall Event Survey to claim a Cisco Live T-Shirt.



Earn up to 800 points by completing all surveys and climb the Cisco Live Challenge leaderboard.



Level up and earn exclusive prizes!



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Contact me at: minse@cisco.com

Thank you

CISCO Live !

