



AI-Powered Wifi7 for Optimized Network Operations

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Agenda

- Introduction
- Wireless Assurance Update
- RF Optimization
- Client Assurance
- Wireless Infrastructure RCA with AI
- AI Assistant for Wireless
- Conclusion

Wi-Fi 7 Update

Intelligent, secure, and assured wireless for the future-proof workplace



Cisco Wi-Fi 7

Next-Level Unified Hardware



Resilient Wireless
for digital transformation



Spaces - the operating system
for smart spaces. Delivering
outcomes out of the box



Global Use AP for efficient,
smart operations: No more
regulatory domains!



Unified Licensing and
Support



Location services with
UWB, GNSS/GPS



Sustainable
product experience

The Wi-Fi 7 portfolio



CleanAir®
Pro

CW9176i

12 Spatial Streams
4x4: 4 MU-MIMO
across 3 radios, 3 bands
(2.4/5GHz (XOR), 5 GHz, 6GHz)

BLE/IoT and dedicated scan radio

Single 10Gbps multigigabit

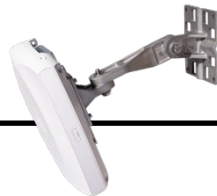
Ultra Wide Band (UWB)

USB 2.0 – 9W

Accelerometer

Built-in GPS/GNSS, w/ support for
ext. antenna

Integrated Omnidirectional Antenna



CleanAir®
Pro

CW9176D1

12 Spatial Streams
4x4: 4 MU-MIMO
across 3 radios, 3 bands
(2.4/5GHz (XOR), 5 GHz, 6GHz)

BLE/IoT and dedicated scan radio

Single 10Gbps multigigabit

Ultra Wide Band (UWB)

USB 2.0 – 9W

Accelerometer

Built-in GPS/GNSS, w/ support for
ext. antenna

Integrated Directional Antenna
(70x70)



CleanAir®
Pro

CW9178i

16 Spatial Streams
4x4: 4 MU-MIMO
across 4 radios, 3 bands
(2.4 GHz, dual 5GHz, 6GHz)

BLE/IoT and dedicated scan radio

Dual 10Gbps multigigabit

Ultra Wide Band (UWB)

USB 2.0 – 9W




Accelerometer

Built-in GPS/GNSS, w/ support for
ext. antenna

Integrated Omnidirectional Antenna

Same brackets as always

The Latest Wi-Fi 7 portfolio

  
CleanAir® Pro

CW9172I

6 Spatial Streams
2x2:2 across 3 radios, 3 bands
(2.4GHz, 5GHz, 6GHz)
-or-
2x2:2 on 2.4GHz and 4x4:4 on 5GHz




BLE/IoT and dedicated scan radio

Single 2.5Gbps multigigabit uplink

USB 2.0 – 4.5W

DC Power Jack

Integrated Omnidirectional Antenna

  
CleanAir® Pro

CW9172H

6 Spatial Streams
2x2:2 across 3 radios, 3 bands
(2.4GHz, 5GHz, 6GHz)

BLE/IoT and dedicated scan radio

Single 2.5Gbps multigigabit uplink

3x 1Gbps LAN port with 1x POE out

1x Passthrough port

Integrated Omnidirectional Antenna

Same brackets as always. 9172H compatible with Meraki or Catalyst brackets

Wireless Assurance Update

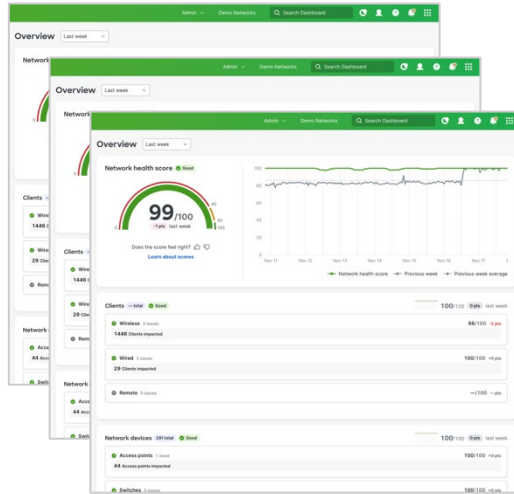
Assurance focus areas and vision



AI/ops & Assurance enables great user experiences.

Expanded Org-level assurance view

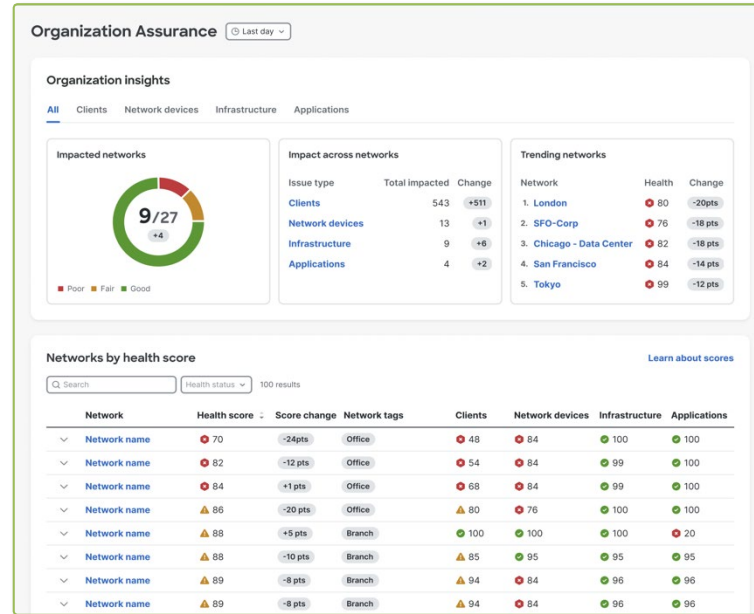
Network-wide Assurance



Network to -> Client or Device-level drill down

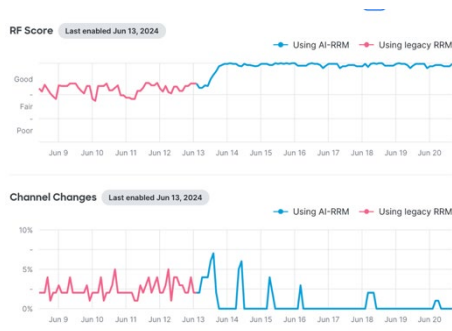
Org-wide Assurance

In-Beta



Org-level discovery workflow

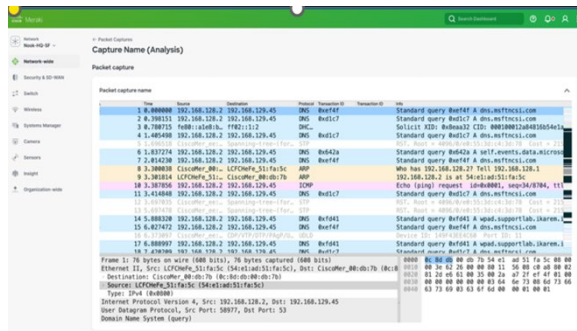
Improving operation efficiency...



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

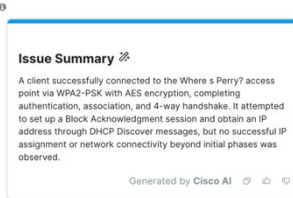
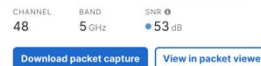


Intelligent Packet Captures

- Complex troubleshooting made simple
- Save expensive issue recreation cycles

Feb 9
23:32:40

Failed connection to SSID **alice_sim_network** on access point **c4:d6:66:62:9b:d0** during DHCP.



AI Packet Analyzer

- AI based RCA derived from packet captures
- Simple to consume based on evidence

RF Optimization

What is radio resource management?

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

Some examples

Busy Hour,
AI Channel Planning

Transmit Power
Control (TPC)

Dynamic Channel
Assignment (DCA)

Dynamic Band
Selection (DBS)



Why AI-RRM

Better Connection

Improved SNR using
AI-based TPC/DCA

Improved Application

Avoided Interferences

Wire-like

Reduce Ch. Changes
to 1/100

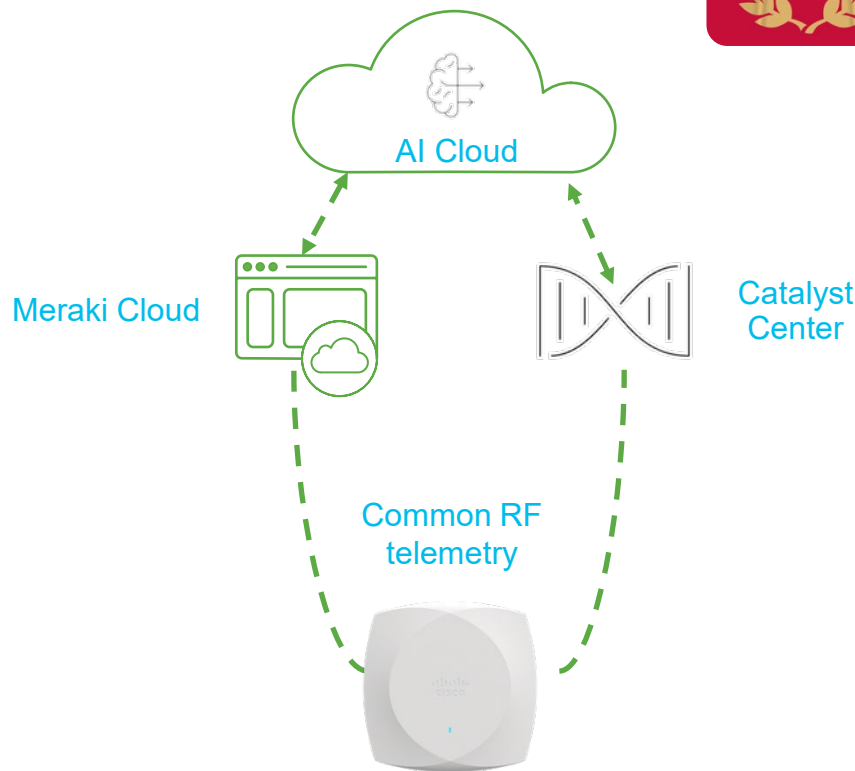
AI RF Optimization works at every steps of Wi-Fi experience

AI-RRM with Cisco Wireless

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



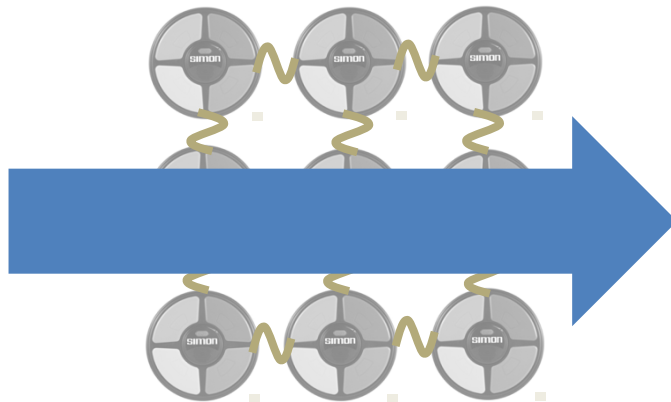
AI-RRM leapfrogs decades of innovations

Gen.1 Per-AP RRM



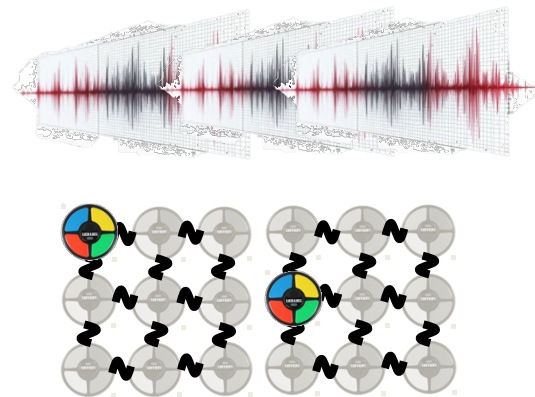
- Each AP makes own RF changes independently, at own timing
- Cascading RF changes could introduce infinite change-loops

Gen.2 Snapshot RRM



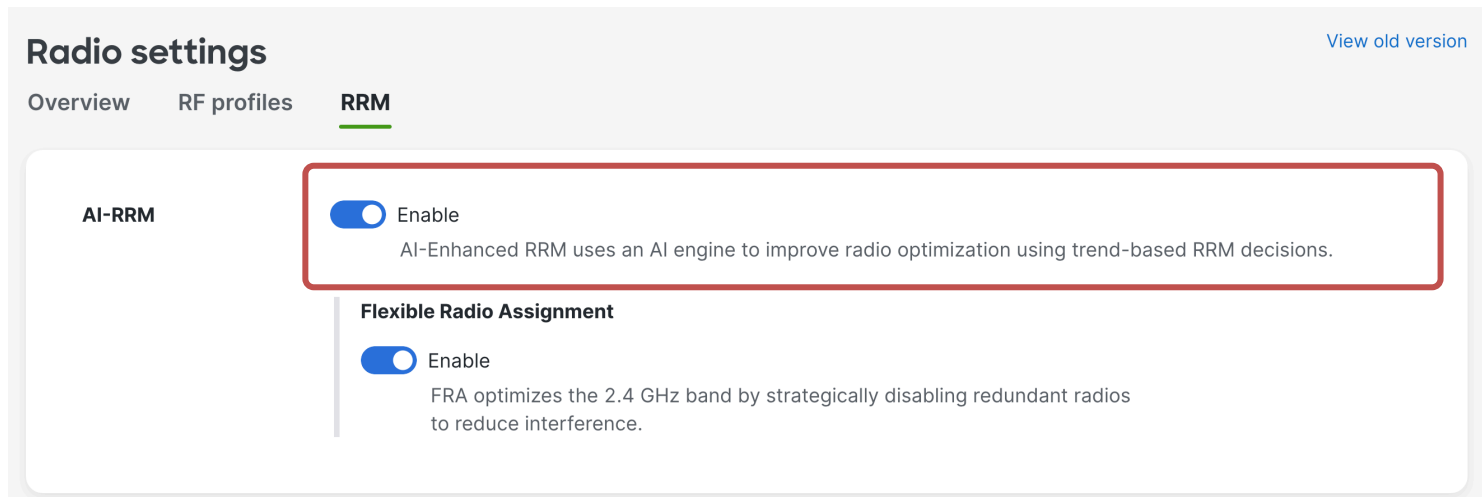
- All APs in the same building (RF group) makes RRM decision all at once
- No cascading effect
- 10~15min, short scanning duration for RF change

Gen.3 Trend-based, AI-RRM



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

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 page or learning curve

AI-RRM Insights

Before & After View

High Co-Channel Interference Last enabled Apr 10, 2025

Insight: 69% less high co-channel interference radios, after AI-RRM was enabled.



RF Score Last enabled Apr 10, 2025

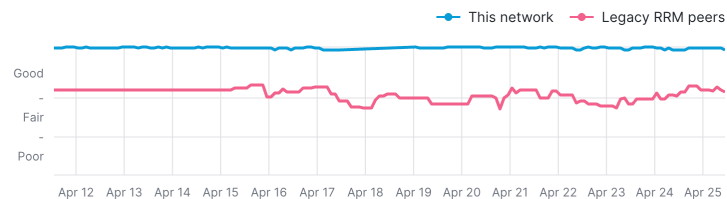
Insight: over 100% RF Health Score improvement, after AI-RRM was enabled.



Peer Comparisons

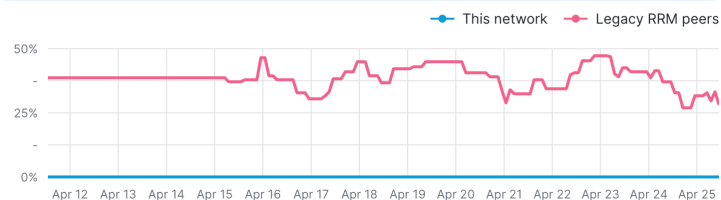
RF Score Last 14 days

Insight: 58% RF Health Score improvement, compared to your peer networks.



High Co-Channel Interference Last 14 days

Insight: 100% less high co-channel interference radios, compared to your peer networks.



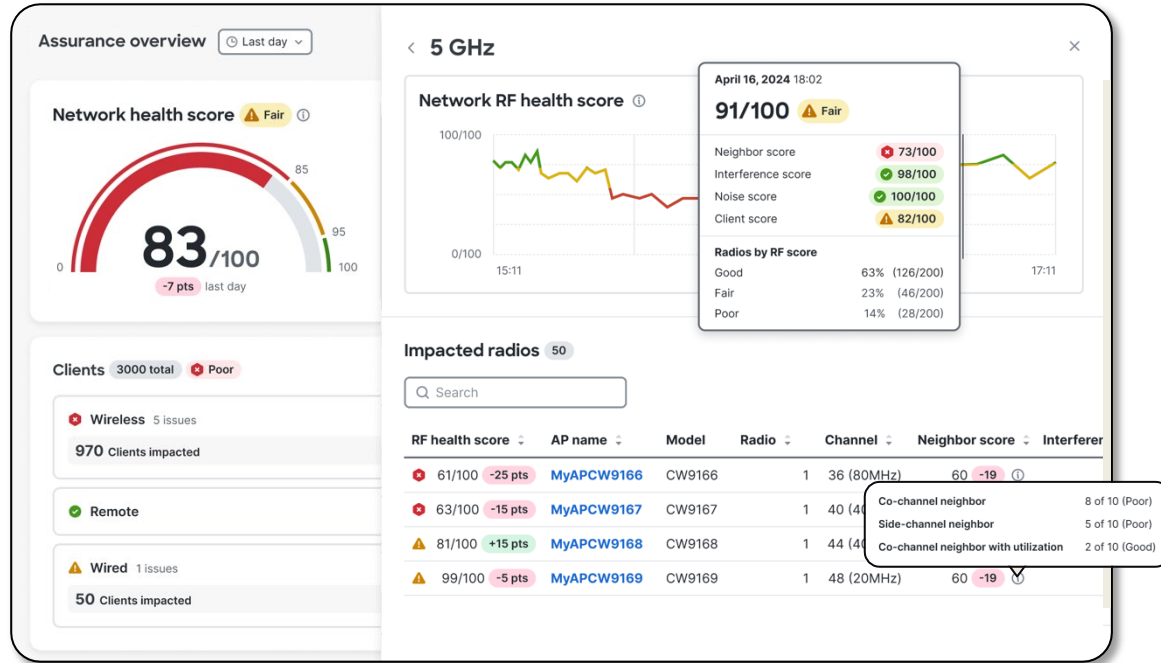
Real-Time Wi-Fi Analyzer at your hand from anywhere, anytime

- Detect and Visualize Root cause of interferers
- Concurrent Operation – running full Wi-Fi analyzer while AP is in service
- Concurrent Inline Packet Capture for further forensic

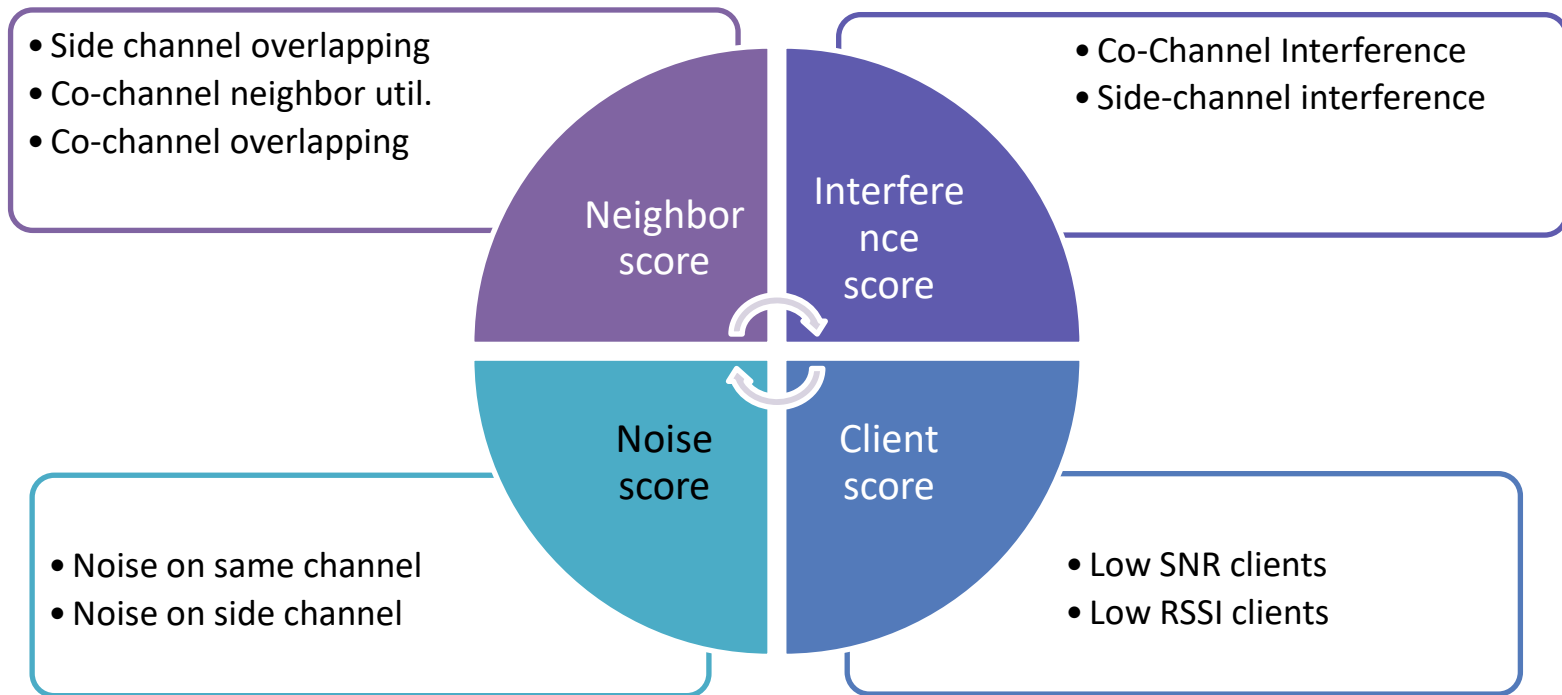


RF Health

- Highlights problematic frequency bands – 2.4, 5, 6 GHz
- 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



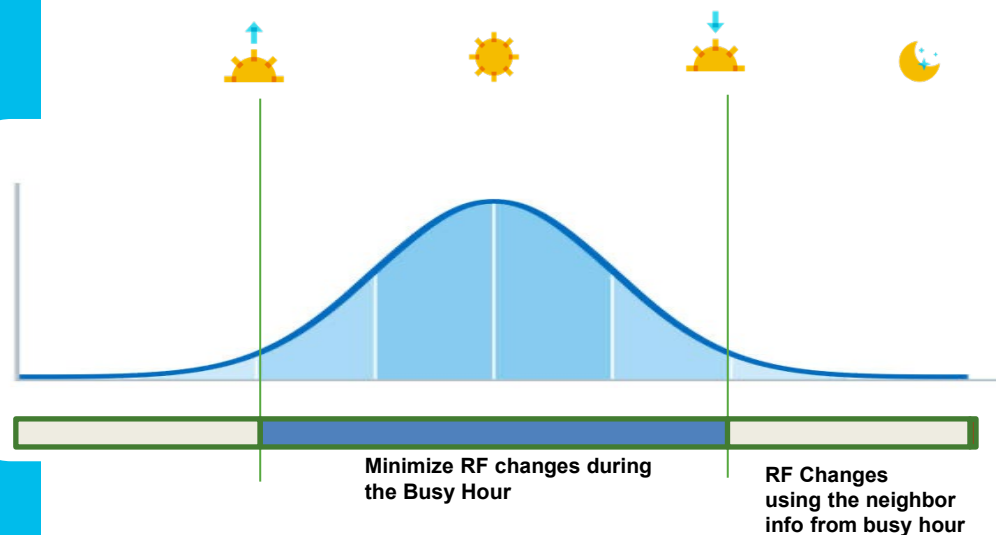
RF Health – Barometers for Over-the-Air RF Spectrum quality assessment tool



Minimize Channel-Change in 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 Busy Hour



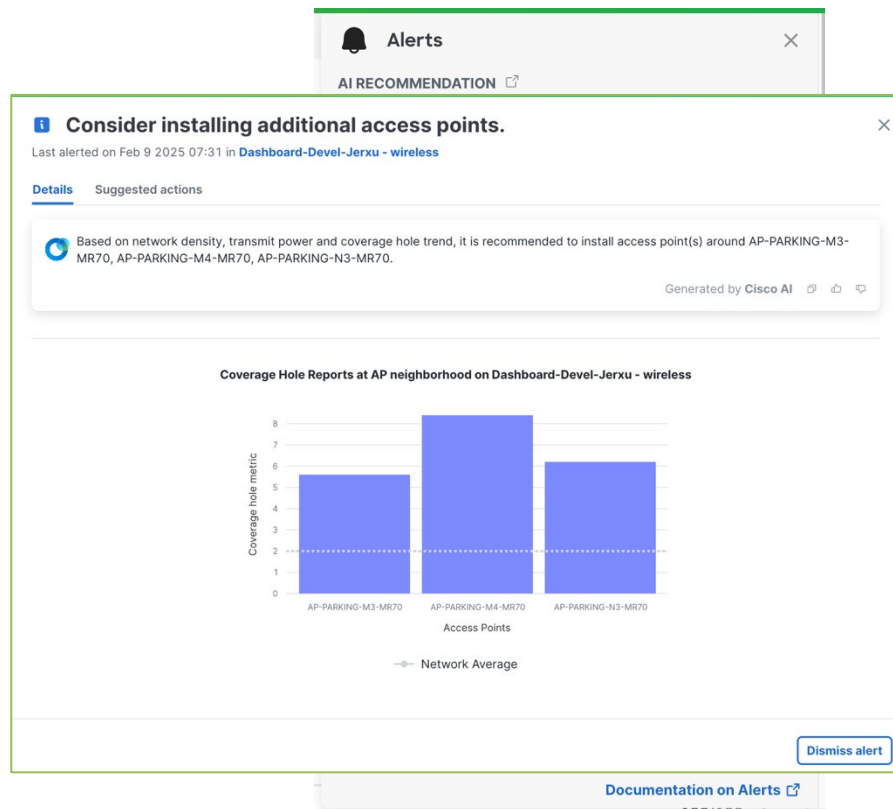
What's next – Wireless Insight and Recommendation

H2CY25

Network AI Agent continually assess network operation holistically and suggest the best possible remediation

Recommendation Types

- Config Insight
- Firmware Insight
- Coverage Insight (non-config)
- Per Client telemetry



Demo

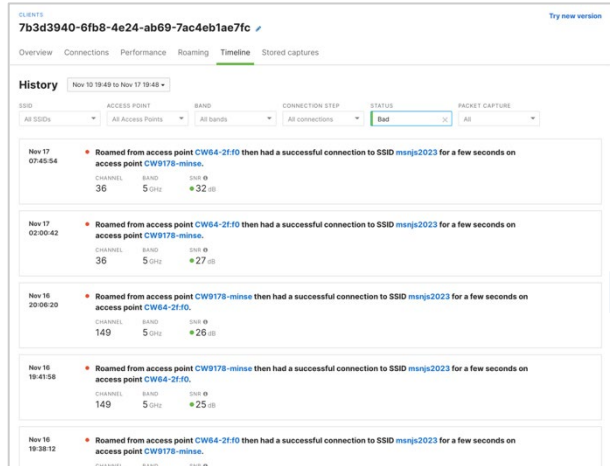
- RF Optimization



Wireless client troubleshooting

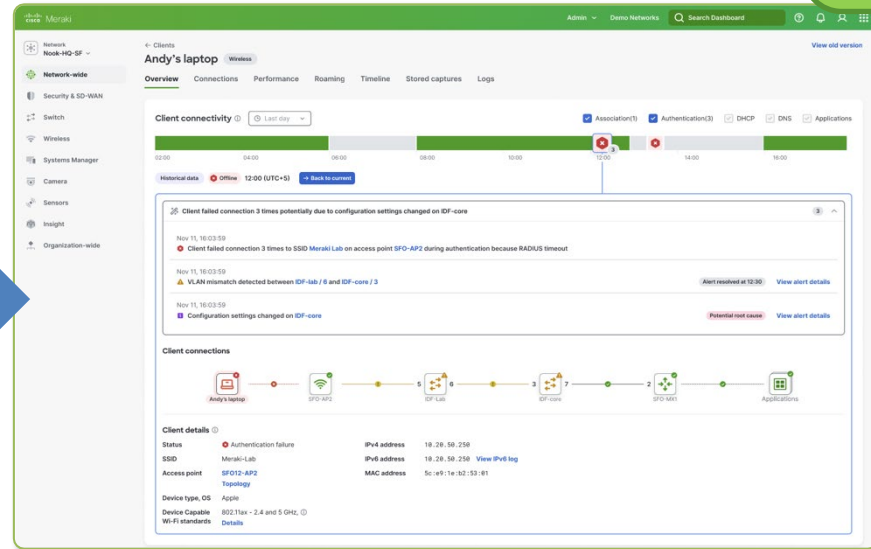
Brings all the internetworking level timeline view to the forefront of the client page

Wireless-only Timeline



Client Network Timeline

InProgress



Network-wide client experience with timeline
E2E network correlation and Topology

Intelligent capture

Next Generation Packet Capture Solution for Wired and Wireless

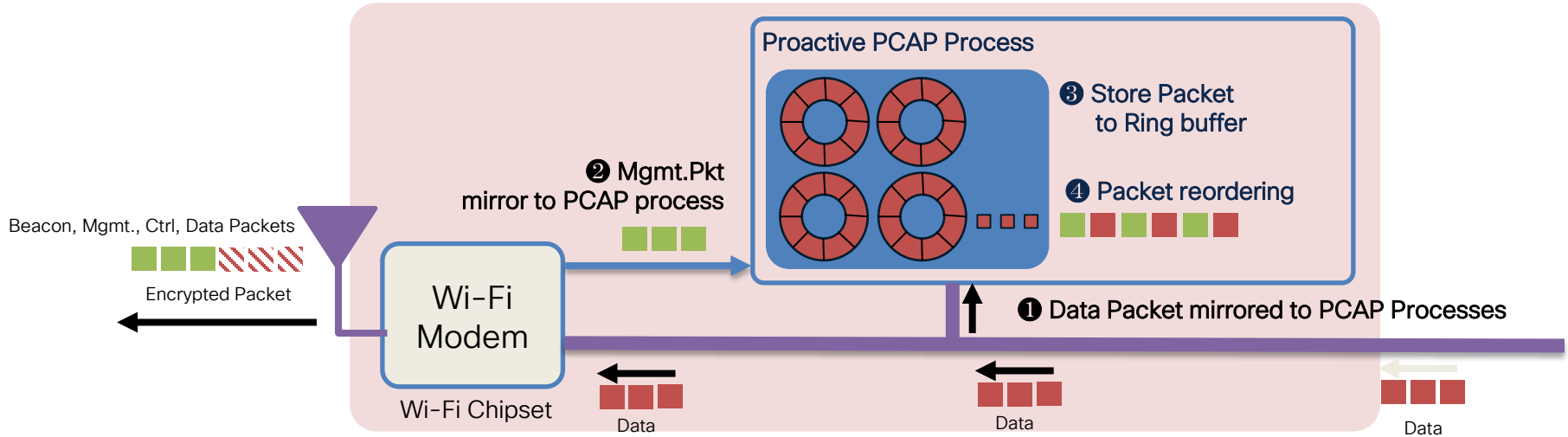
The screenshot displays the Meraki dashboard's 'Packet Captures' section. The top part shows a list of packet captures with columns for Time, Source, Destination, Protocol, Transaction ID, and Info. A detailed view of a selected packet (Frame 1) is shown below, including Ethernet II, Internet Protocol Version 4, and User Datagram Protocol details. The bottom section, 'Packet Capture Analysis', provides a summary of tests performed across various protocols (DNS, DHCP, ARP, ICMP, ARP, MAC address, and Device). The summary indicates that most tests passed, with some failures noted for DNS, DHCP, and ARP.

Packet Capture Analysis Summary:

- DNS:** 3/3 tests failed. Tests include: Standard query 0xef4f A dns.msftncsl.com, Standard query 0xd1c7 A dns.msftncsl.com, Solicit ID: 0x00000000 ID: 00000000, Standard query 0xd1c7 A dns.msftncsl.com, RST, Root = 4896/0/e0:55:3d:c4:3d:78 Cost = 210, Standard query 0x642a A self.events.data.microsoft.com, Standard query 0xef4f A dns.msftncsl.com, Who has 192.168.128.2? Tell 192.168.128.1, 192.168.128.2 is at 54:el:ad:51:fa:5c, Echo (ping) request id=0x0001, seq=34/6704, ttl=64, Standard query 0xd1c7 A dns.msftncsl.com, RST, Root = 4896/0/e0:55:3d:c4:3d:78 Cost = 210, RST, Root = 4896/0/e0:55:3d:c4:3d:78 Cost = 210, Standard query 0xf641 A wpad.supportlab.ikaren.com, Standard query 0xef4f A dns.msftncsl.com, Device ID: 149F43EE4C68 Port ID: 11, Standard query 0xf641 A wpad.supportlab.ikaren.com, Standard query 0xf641 A dns.msftncsl.com.
- DHCP:** 3/5 tests failed. Tests include: DHCP offers from multiple DHCP servers (Failed), DHCP Transactions Completed (Failed).
- ARP:** 3/5 tests failed. Tests include: Multiple clients failing to resolve the same IP address (Failed), One client repeatedly failing to resolve the same IP address (Failed), One ARP request and multiple ARP responses (Failed).
- ICMP:** All tests passed. Tests include: Multiple clients failing to ping the same IP address (Passed), One client repeatedly failing to ping the same IP (Passed), Intermittent responses for a client pinging an IP address (Passed).
- MAC address summary:** These MAC addresses appeared in at least one of the failed tests. (List of MAC addresses).
- Device summary:** These devices appeared in at least one of the failed tests. (List of device IDs).

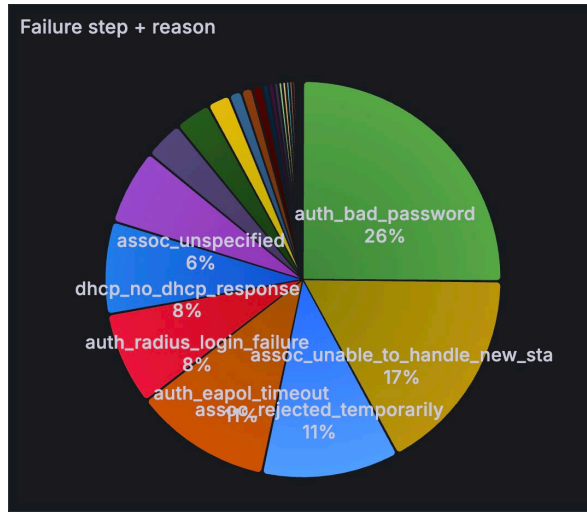
Proactive Automated Integrated

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 capture conditions

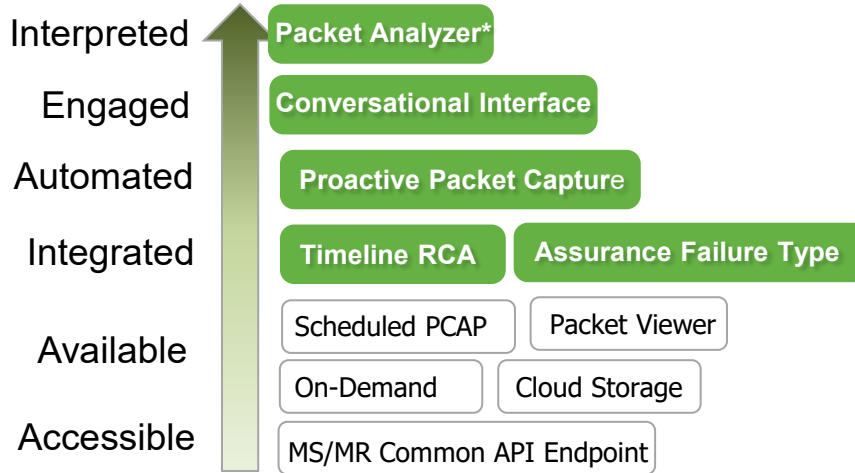


auth_bad_password	2206828
assoc_unable_to_handle_new_sta	1485015
assoc_rejected_temporarily	982336
auth_eapol_timeout	979787
auth_radius_login_failure	664526
dhcp_no_dhcp_response	659806
assoc_unspecified	538172
ip_timeout	271664
dns_no_dns_response	251430
assoc_invalid_pmkid	156542
auth_radius_timeout	84535
deauth_unspecified	73841
dhcp_no_dhcp_ack	67767
assoc_reserved	36707
assoc_na	32037
auth_conn_refused	25953
null_null	20904
dhcp_dhcp_nack	20368
disassoc_invalid_auth	16555
assoc_invalid_mdie	14811
assoc_akmp_invalid	12227
deauth_invalid_auth	9079
assoc_status_invalid_IE	6529
assoc_robust_mgmt_frame_policy_violation	6058
auth_unspecified	6039

Proactive PCAP
automatically
collect Wireless PCAP
All the time at every
conditions,

including “unknown
failure” cases

Intelligent Capture - MR



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

The screenshot displays the Packet Analyzer interface. The main window shows a packet capture for the address 22:1f:fb:e7:7a:d5_P7tyXW_auth_eapol_timeout. A table lists the captured packets:

	Length	Info
R/DSSSI	74	Deauthentication, SN=12, FN=0, F...
R/DSSSI	207	Probe Request, SN=3066, FN=0, F...
R/DSSSI	207	Probe Request, SN=3067, FN=0, F...
R/DSSSI	397	Probe Response, SN=2582, FN=0, F...
R/DSSSI	397	Probe Response, SN=2582, FN=0, F...
R/DSSSI	397	Probe Response, SN=2582, FN=0, F...
R/DSSSI	397	Probe Response, SN=2582, FN=0, F...

Below the table, details for Frame 29 are shown:

```
> Frame 29: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on 0
> Radiotap Header v0, Length 48
> 802.11 radio information
> IEEE 802.11 Deauthentication, Flags: .....
> IEEE 802.11 Wireless Management
  > Fixed parameters (2 bytes)
    Reason code: 4-way handshake timeout (0x000f)
```

A modal window titled "Four-way handshake timeout" is open, showing 1 total issue. The details for Frame No. 29 state: "Four-way handshake is started but did not complete. In addition, AP deauthenticated the client with reason code 15 (four-way handshake timeout)."

Demo

– Client Troubleshooting



Device Assurance

AP Device Health

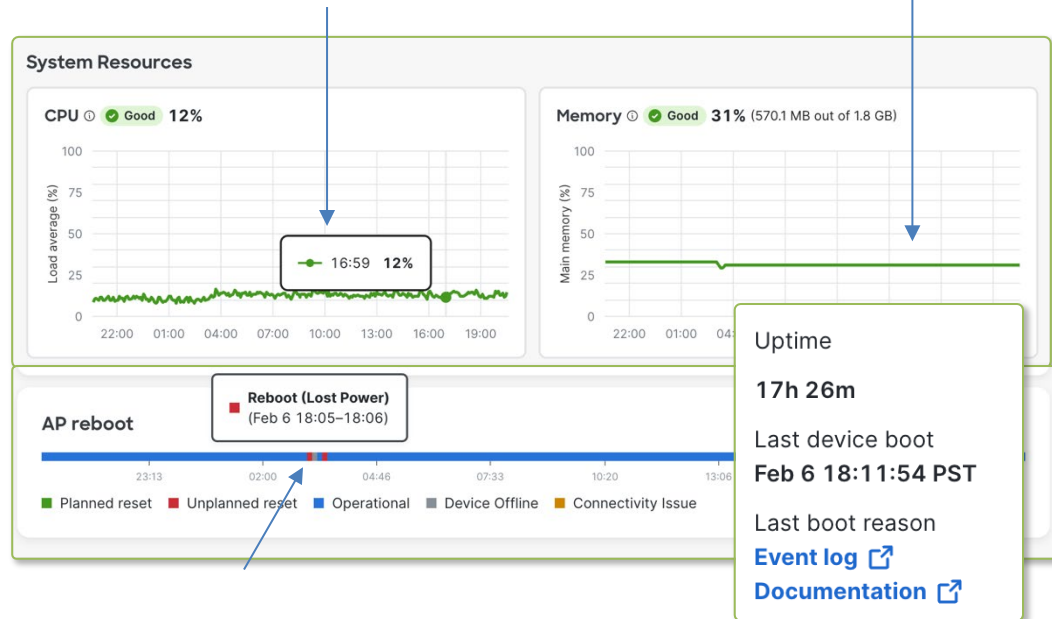
Don't forget the basic

Any CPU Spikes may lead to AP reboot?

Validate there is No Memory Leak

- PoE / Power monitoring
- Build your Own Dashboard, Org-Wide API Ready!

</organizations/{organizationId}/wireless/devices/system/cpu/load/history>



AP Alert Root Cause Analysis

The screenshot shows the Cisco Connect dashboard with a green header bar containing 'Admin', 'Demo Networks', and a search bar. A notification banner at the top reads 'Access point has an ethernet negotiation failure' with a 'Resolved' status. Below this, an alert titled 'Access point became repeater' is displayed, indicating that 'SFO12-4-AP30' has switched to repeater mode. The alert includes a 'Suggested actions' tab with one action: '1. Resolve misconfigured VLAN', which is marked as 'Completed' and includes a green checkmark indicating success. Below the action, a table provides configuration details for two access points.

Access point	SFO12-4-AP30 (gateway)	SFO12-4-AP31 (gateway)
IPv4 address(es)	192.125.25.22	192.125.25.1
IPv6 address(es)	1050:0:0:0:5:600:300c:32aa	1050:0:0:0:5:600:300c:326b
Connected switch	Switchname1 / 5	Switchname2 / 7
Type	Trunk	Trunk
Allowed VLAN	1220-1230, 1260	1220-1230, 1260
Native VLAN	1200	1200

- 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

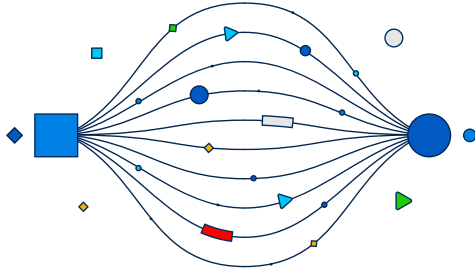
Demo

– Infrastructure Assurance



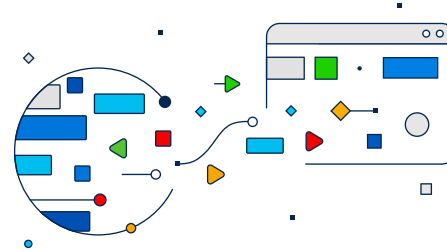
AI Assistant for Networking

AI Assistant Use-case



Intent processing

- Operate as a Network Engineer
- Answering machine for any NetOps inquiry
- Problem Discovery



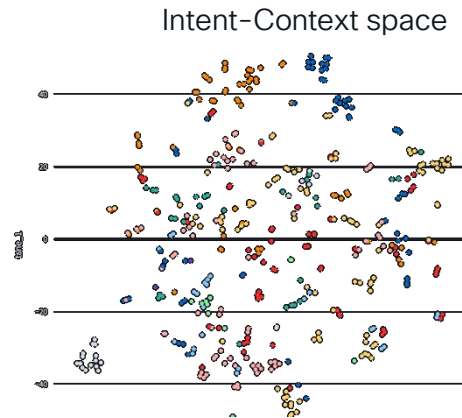
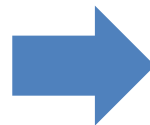
Document Summary

- Create summarization of public document
- Best Practice summarization
- Provide additional references on the inquiry

What's the "Intent"



Context :
*List the wireless
client with the
most failures*



Step1.
End-user ask a question
through the Chat Interface

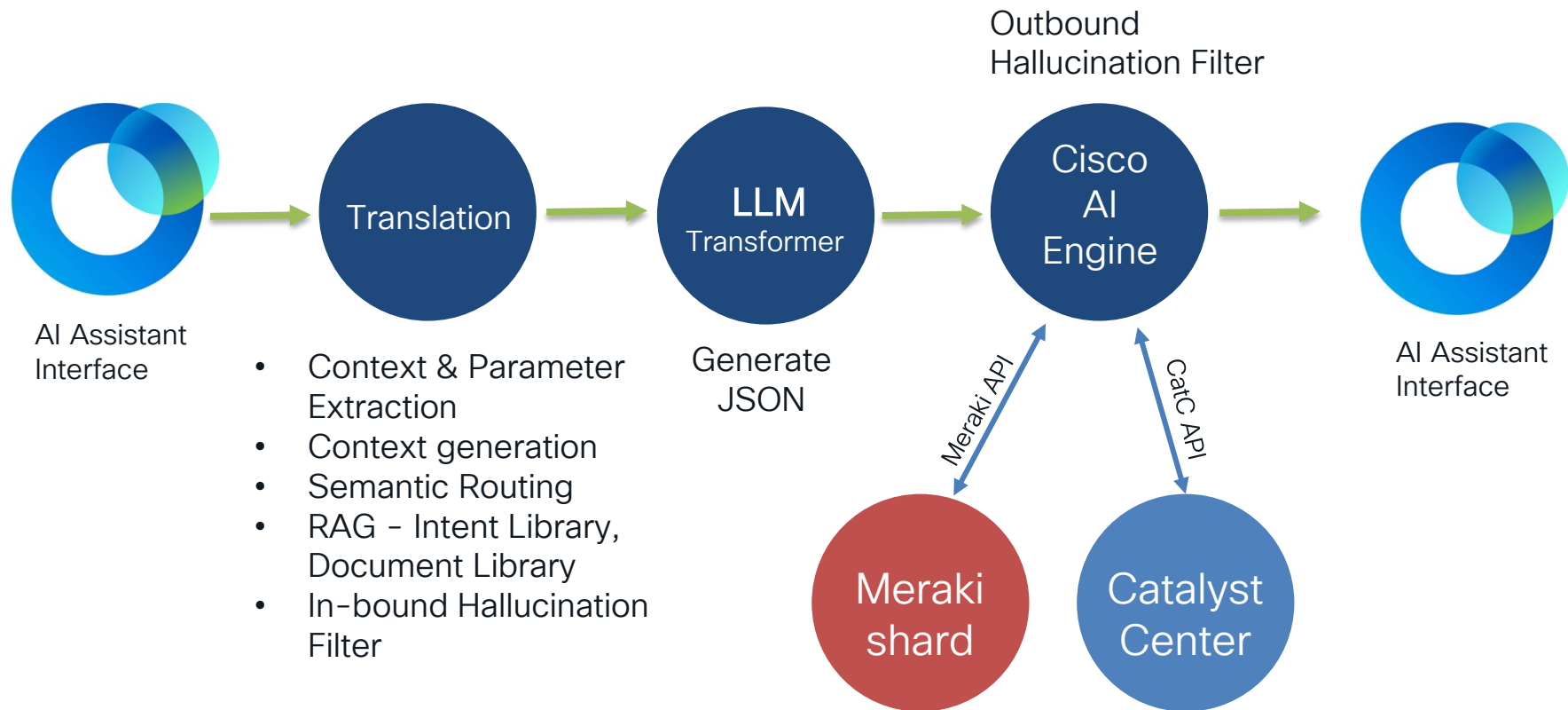
Step2.
AI Assistant translate user
question into Context. Context
often includes parameters and
query conditions

Step3.
User Context compared and
matched up to the nearest intent
from intent-context space

"intent" refers to the purpose or goal behind a user's input, which the assistant interprets to provide an appropriate response or action.

AI Assistant for Networking Architecture

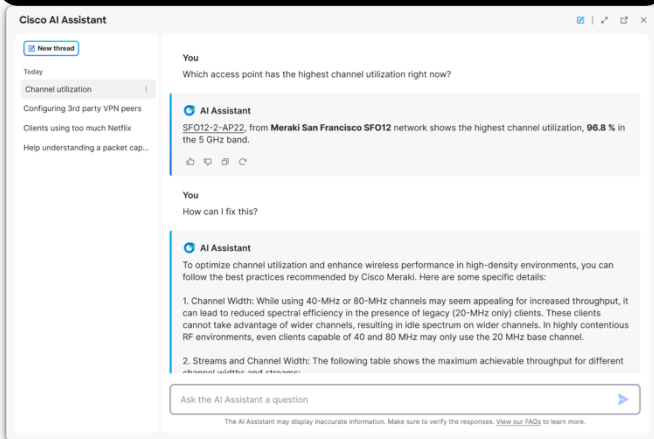
In a nutshell



AI Assistant for Cisco Networking

Customer Beta

GenAI-based, Conversational Interface



Client
Troubleshooting



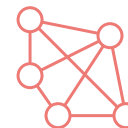
Client Troubleshooting using
unique partnership with **Apple**,
Intel, **Samsung**

Infrastructure
Troubleshooting



AI-Driven RCA, End-to-End Network
Correlation orchestrated **through**
conversational interface

Network
Automation



Conduct Network Change
Management **by conversation**

Documentation,
Best Practice, Tips



AI Generated, Summarization of
Cisco Document Libraries and
CX Best Practices

Demo

- AI Assistant



Conclusion

- Cisco Wireless AIOps committed to offer scalable, resilient wireless network
- Wireless AIOps automate Packet Capture process and its analysis as the seamless, connected experience.
- Cisco AI-RRM proves its outcome and advantage through open, measurable, success metric.
- Cisco AI Assistant for Networking will offer secure, privacy first operation



Thank you