

# Modernizing Infrastructure

Modernizing Wireless – Rethinking Connectivity with AI and Location Services

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# What Does Modernization Look Like?

”AI”

# World Class Data Lake Since 2012

A Globally Deployed Cloud in >190 Countries



4.7 Million

Active Customer Networks

15 Million

Cisco Meraki Devices Online

639 Million

Daily End User Devices Connected

>5

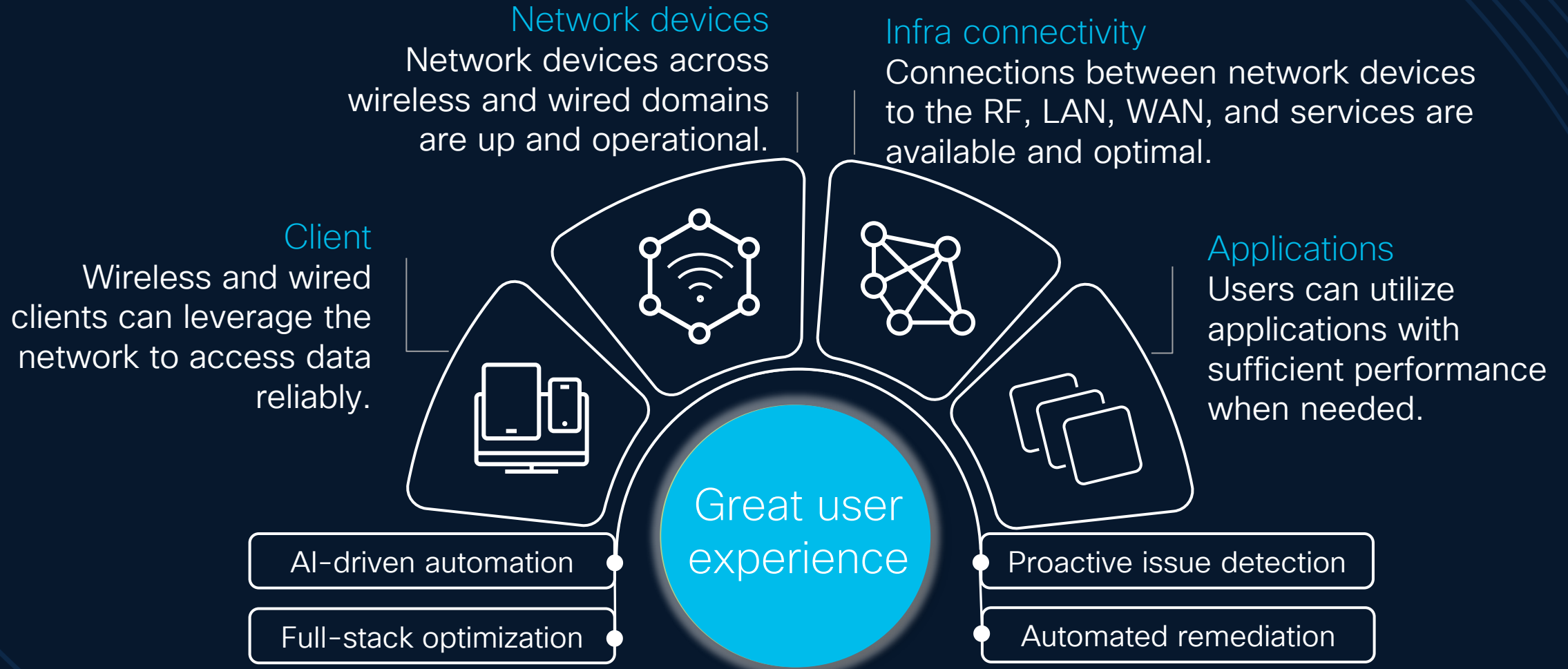
Customers with >100K devices.

One customer deployed 285K Access Points





# Assurance Focus Areas and Vision



*AIOps & Assurance enables great user experiences.*

# Cisco's (epic) Wi-Fi 7 Launch...

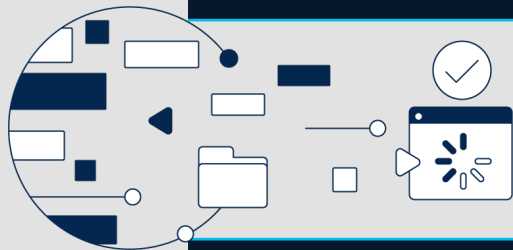


## Cisco Wireless Wi-Fi 7 Access Points

We're stepping into the Wi-Fi 7 era with a full solution to help customers build a truly AI-ready Enterprise

## Cisco Spaces

Going beyond basic wireless, reimagining the way users interact with physical environments, helping customers unlock new growth



## Cisco Unified Experience for Wireless

Simplifying how customers do business with Cisco and scale operations with unified licenses, hardware, and support

# Cisco Wi-Fi 7: A Step Beyond Unified Hardware!

One product for efficient, smart, sustainable operations.



## Global Use AP

No more regulatory domains!

## Spaces

The OS for smart spaces: outcomes delivered out of the box.

## Sustainable

No plastic bags. Bracket opt-out option. Ten Pack!

## Intelligent Mode

Automatic cloud or on-prem deployment.

# Cisco Wi-Fi 7

Next Level Unified Hardware for the AI Enterprise



Resilient Wireless for digital transformation



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



UWB and Wi-Fi 7, with GNSS/GPS built in



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



Sustainable product experience

CW9178I

Quad radio, 4x4 (16ss); 2.4, 5, 5, 6 GHz

CW9176I & CW9176D1

Tri-radio, 4x4 (12ss); 2.4/5, 5, 5/6 GHz

*Single Global PID*



# Unified Access Points



## CW9176I & CW9176D1

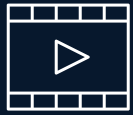
- Tri-radio (12ss); 2.4/5, 5, 6 GHz
- UWB
- Built-in GNSS
- Single 10 Gbps port



## CW9178I

- Quad radio, 4x4, 16ss (2.4, 5, 5,6)
- UWB
- Built-in GNSS
- Dual 10 Gbps ports for redundancy

# Wi-Fi 7 Use Cases



4k/8k video  
Streaming



Multi-user  
AR/VR/XR



Emergency  
preparedness  
communication  
services



IOT &  
Location  
Services



Employee  
Experience



Immersive  
gaming &  
entertainment



Automotive



Immersive  
learning

# What Is Wi-Fi 7? (And A Bit of 802.11be)\_



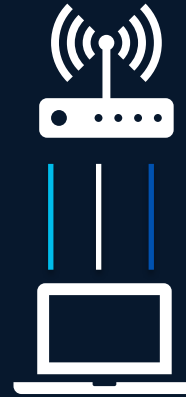
320 MHz in 6 GHz



4K QAM



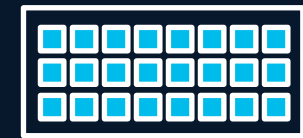
Multi-RU



MLO



Enhanced Security



Compressed Block Ack  
(512 MPDUs)



Preamble puncturing

Mandatory in 6. Optional in 5  
Min ch. width of 80



Triggered UL Access Optimization



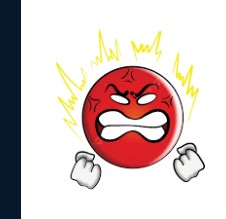
EPCS

# Wi-Fi 7 and 4K QAM

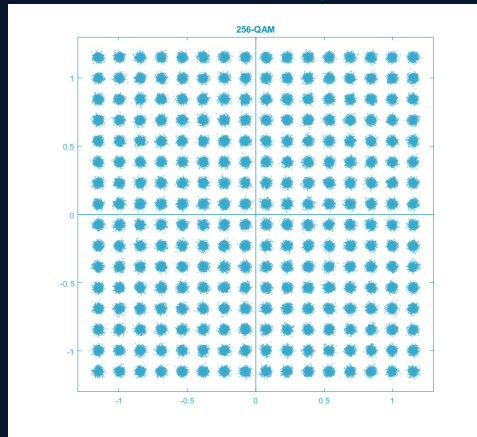
QAM – Quadrature Amplitude Modulation

Data Rate (Modulation Density) or (How many bits per Radio Symbol)

Need very high SNR for 4K QAM

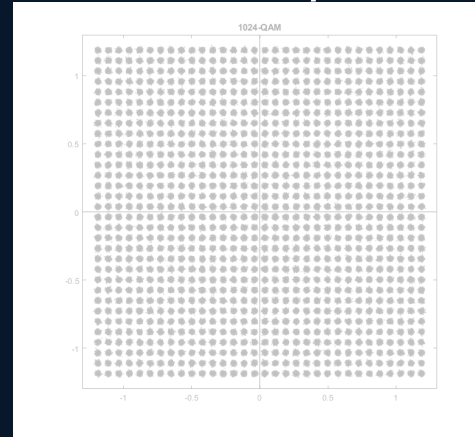


Wi-Fi 5



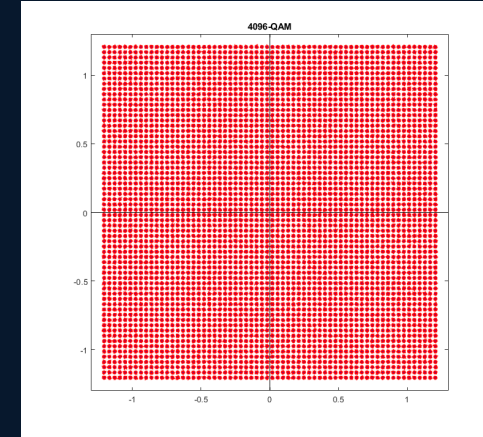
256 QAM

Wi-Fi 6/6E



1024 QAM

Wi-Fi 7



4096 QAM

20% increase in data rates when compared to Wi-Fi 6



# Wi-Fi 7 and Multi-Link Operations (MLO)

*MLD: Multi Link Device*



Method	Benefit
Aggregation	Throughput
Steering	Lower Latency
Redundancy	Reliability

# Wi-Fi 7 Preamble Puncturing

Without Preamble Puncturing:



With Preamble Puncturing:

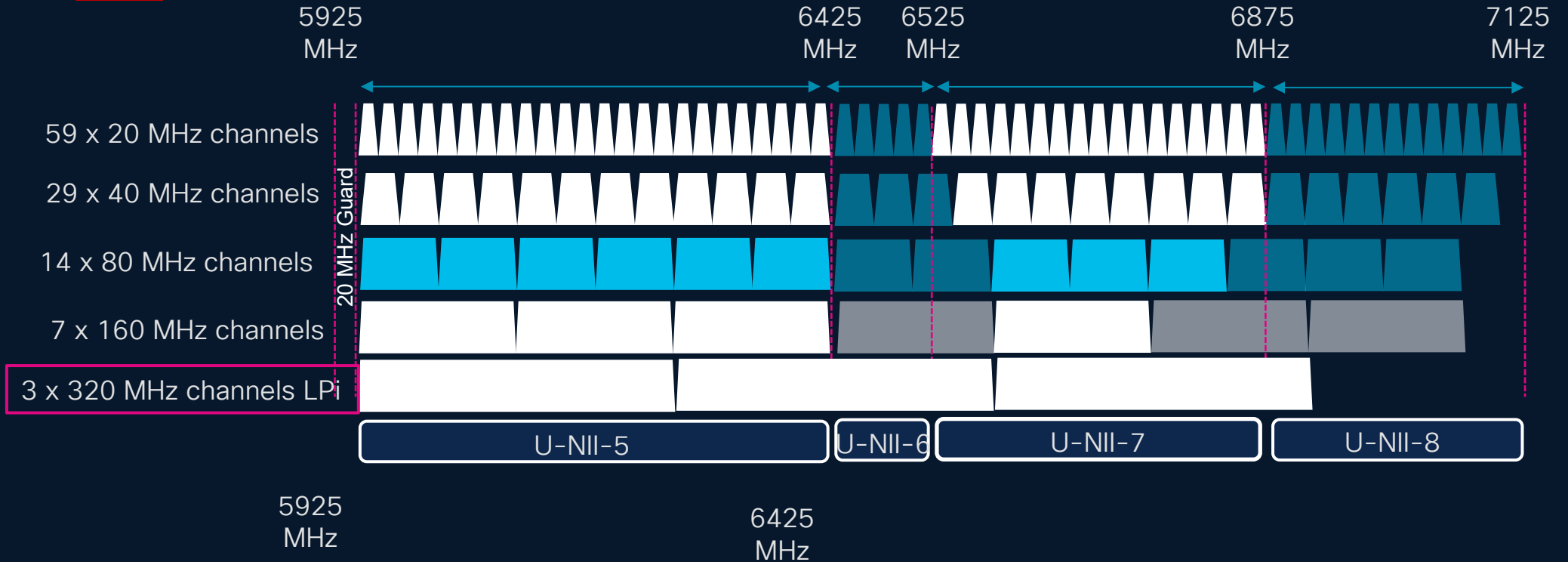


Puncturing allowed for  
80 MHz channel width or wider

Chanel Width	Allowed Puncturing
80 MHz	20 MHz
160 MHz	20 or 40 MHz
320 MHz	40 or 80 MHz (or) 40 + 80 MHz

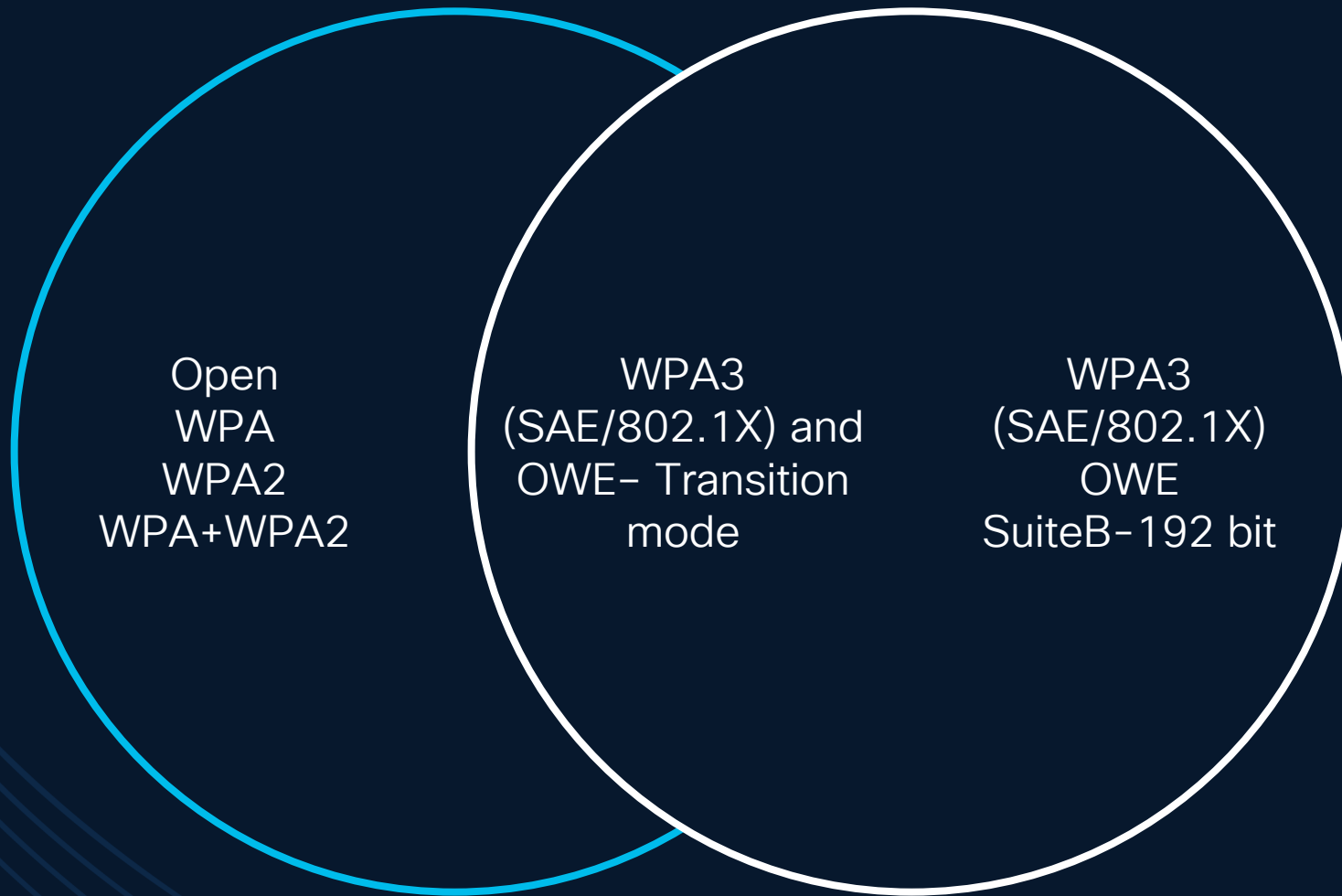
# Wi-Fi 7 and 320 MHz Channel Width

6GHz Spectrum in US and Canada: 1200 MHz



Note: 3x320 MHz channels LPI  
1x320 MHz channels SP - (US)  
2x320 MHz channels SP - (Canada)

# Wi-Fi 7 Mandates Better Security



- Enforcement options
  - AP Level (On-Prem)
  - Config Level (Cloud)
- Current implementation

# Assurance Is Wi-Fi 7 Ready

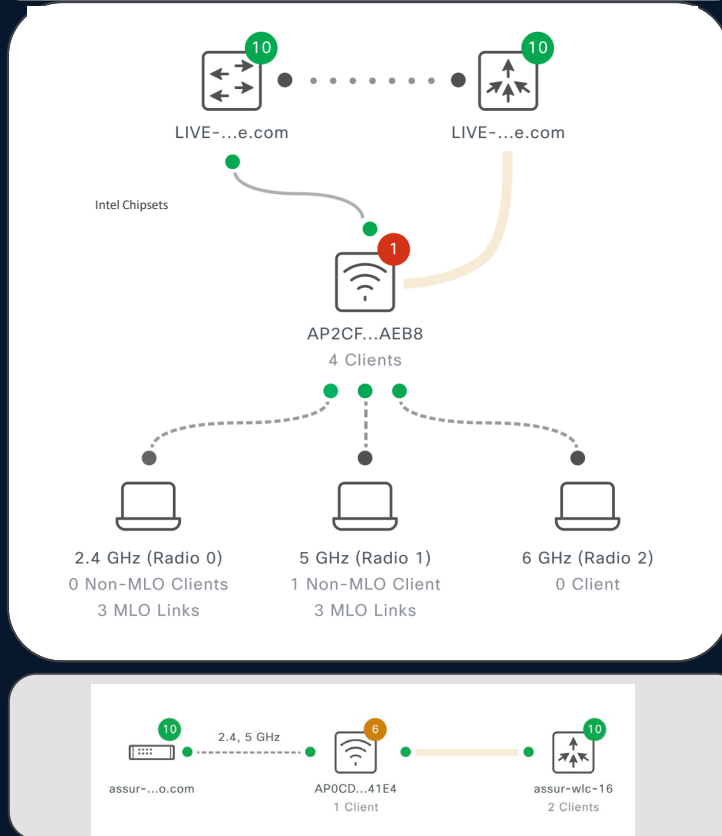
MLO, Puncturing, and Protocol Capability Supported Across Catalyst Center

Available in v2.3.7.9

## MLO & Puncturing Incorporated Across Clients and AP Pages



## MLO Connections Visualized with New Topology View



## MLO Clients Triaging Enabled with Multi-Band PCAP

**Client Packet Capture Configuration:**

- Running OTA Sniffer
- Select OTA Sniffer: **Multi-Radio Select for OTA Sniffer**
- Defaults set to channels and channel widths client **wireless-MBP** is currently connected to.
- AP 1: Assurance\_9130\_3
- Radio: R0 (Band: 2.4 GHz, Clients connected: 0, Channel: 1, Channel Width: 20 MHz)
- Radio: R1 (Band: 5 GHz, Clients connected: 2, Channel: 149, Channel Width: 40 MHz)
- Radio: R2 (Band: 6 GHz, Clients connected: 4, Channel: 175, Channel Width: 160 MHz)

**Automatic Multi-Band Capture:**

Full PCAP capture all packets sent to and from the AP. Data packets are decrypted and payload can be read. If a MLO capable client is connected to more than one band, packets will be captured on each link and sent as a single PCAP file.

# Modernized Operations



# Global Use Access Point

## Simplified Ordering

- Same SKU no matter how or where the AP is deployed
- No more Regulatory Domains
- Same Lead Time

## Simplified Deployment

- Planning and install teams plug in the AP.
- Meraki Dashboard or WLC is auto detected.
- Dashboard can be used as PnP tool by partners(!).

## Simplified Lifecycle

- Customers can freely move APs between WLC and Meraki mode.
- One Inventory(!)
- Simplified RMA and factory resets.

# Global Use Access Points in a Nutshell

## Global Use APs Simplify the Cisco Wireless AP Portfolio

### Decouple From...

#### Geography

The Access Point PID/SKU is decoupled from which geography (regulatory domain) they can be used in.

No more -B, -E, -ROW etc for Wi-Fi 7 APs

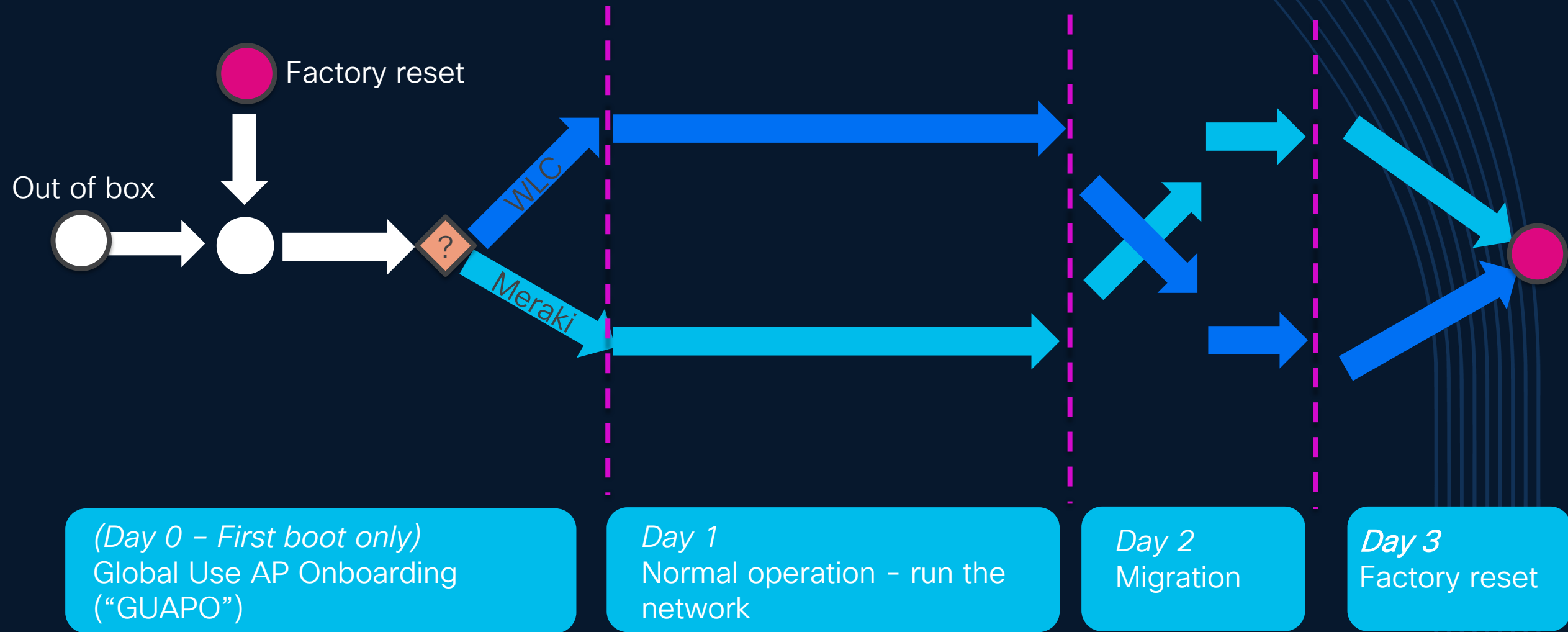
#### Boot Mode

The Access Point can automatically connect to the Cisco Meraki Dashboard or a 9800 series WLC out of the box.

The AP does this automatically via DHCP, ping, etc. on first boot.



# Map of a Global Use AP Journey



# How an AP on a WLC Determines a “Country Code”

Country Code determination is only done once – unless the admin triggers a country reset. APs will not auto-change country codes, but network admins can change them.

## GNSS / GPS

APs with integrated radios

## From Migration

APs migrated from the Dashboard to a WLC will retain the country code.

## Proximity

Learn from nearby APs (using RF) on same WLC

## Manually

Download a Regulatory Activation File (RAF) from Dashboard that can be installed on WLC

# Day 1 – In Cisco Meraki Dashboard

**Wireless**

**Organization**

**Adaptive Policy**

**Find in Menu**

fe80::bedb:9ff:fed1:ccb6

DNS  
2620:119:53::53  
2620:119:35::35

SERIAL NUMBER  
WNT28110102 (Catalyst)  
Q5BB-EP36-N96B (Meraki)

TAGS

NOTES

FIRMWARE  
Up to date  
Current version: Firmware version locked,  
please contact support  
[Open source licenses](#)

CONFIG  
Up to date

POWER  
14.97 W  
(running in low power mode) ⓘ  
PoE 802.3at

REGULATORY INFO  
Enforced Country: US

2.4 GHz

Category	Usage (%)
1	50
2	35

6 GHz

Category	Usage (%)
1	10
5	5

**Live mesh neig**  
This access po

**Historical**

No wireless data in the s  
per

# Country Code Visibility in WLC

Global Use APs will join WLC irrespective of country code.

For AP to be operational the WLC country code must match the list of countries

Monitoring > Wireless > AP Statistics

General | Join Statistics | AFC Statistics

Total APs : 3

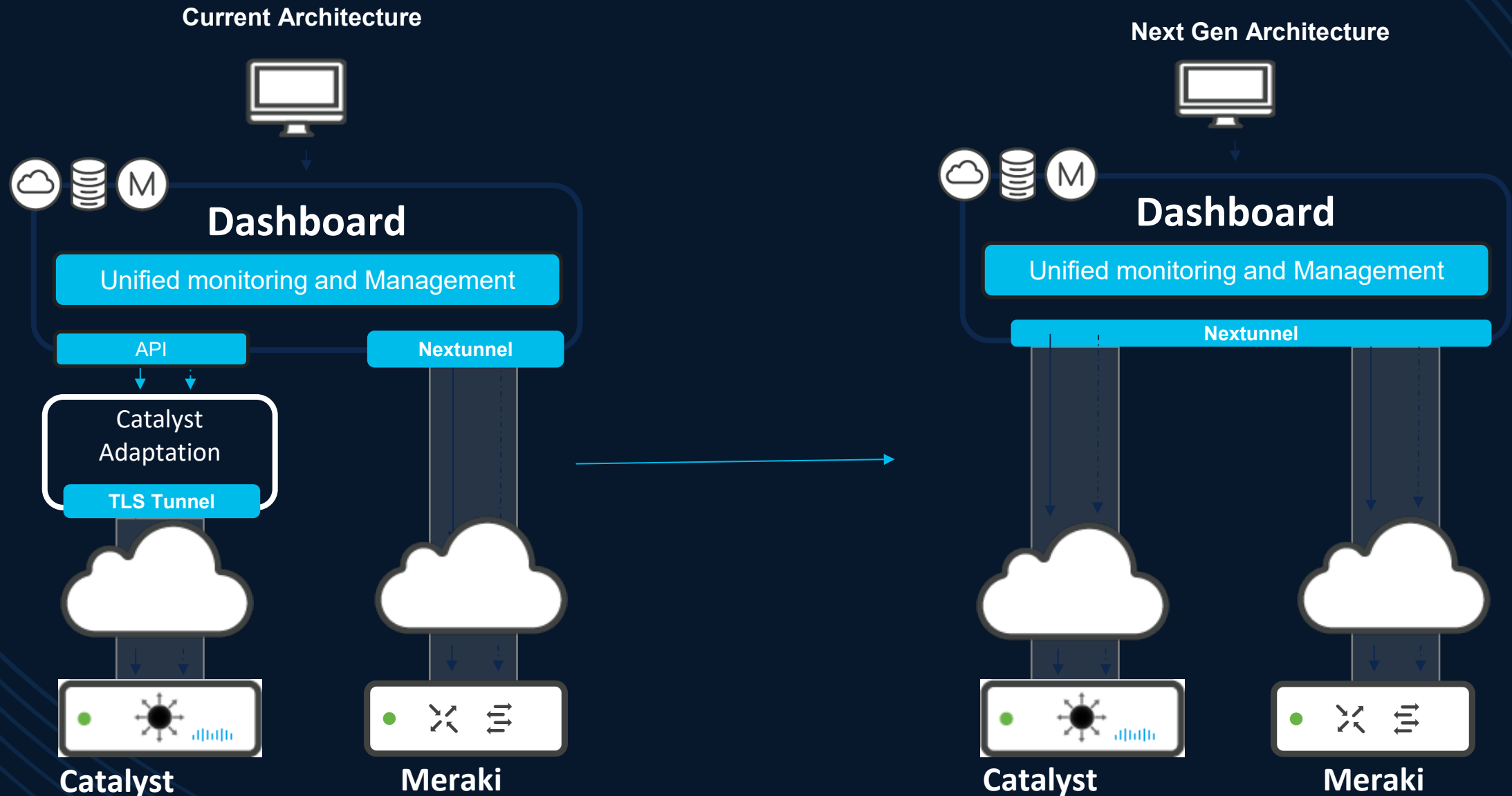
Misconfigured APs: Tag : 0 | Country Code : 0 | LSC Fallback : 0

Multiple APs can be configured at once from [Bulk AP Provisioning](#) feature

AP Name	AP Model	Admin Status	Up Time	IP Address	Ethernet MAC	Operation Status	Configuration Status	Country	Regulatory Domain	AP Profile
Kangaroo	CW9178I	✓	22 days 15 hrs 59 mins 22 secs	172.21.144.240	c414.a26f.b400	Registered	Healthy	US	-B	default-ap-prof
9163E-O1	CW9163E-B	✓	38 days 2 hrs 1 mins 39 secs	172.16.1.163	6849.92ff.9810	Registered	Healthy	US	-B	default-ap-prof
APC414.A2D2.A240	CW9176I	✓	0 days 0 hrs 6 mins 9 secs	172.17.30.17	c414.a2d2.a240	Registered	Healthy	US	-B	default-ap-prof

1 - 3 of 3 items

# Native Catalyst Onboarding through the Cisco Meraki Dashboard



# Introducing “Cloud ID”

Starting with Wi-Fi 7, the “Meraki Serial Number” has been renamed to the “Cloud ID.” There is no functional change to how it is used.

This is reflected on AP label, packaging, QR code, etc.



# Migration For Wi-Fi 7 APs (Only)

## Access Points Last day

+ Add access point

Overview **List** Health Map Connection log Timeline

**i** Recommendations from Network Like Yours **reduce latency by up to 40%** [Run diagnostics](#)

0 Offline 0 Alerting 4 Online 0 Repeaters

Filters 5 results Download

1 Item selected [Select all 5 items](#) Cancel Tag Move Remove Migrate to WLC

<input type="checkbox"/>	Status	Name	MAC address	Connectivity (UTC-7)	Model	Local IP	Firmware version	Serial	
<input checked="" type="checkbox"/>	✓	<b>VT-demo-unit</b>	c4:14:a2:d2:a2:40	<div style="width: 100%;"><div style="width: 100%;"></div></div>	CW9176I	172.17.1.172	Firmware version locked, please contact support	Q5BE	
<input type="checkbox"/>	✓	<b>Aardvark</b>	c4:14:a2:d2:7f:80	<div style="width: 100%;"><div style="width: 100%;"></div></div>	MR57	172.21.144.229	MR 31.1.4	Q5BE	
<input type="checkbox"/>	⊖	<b>Lemur</b>	c4:14:a2:d2:b0:f0	<div style="width: 100%;"><div style="width: 0%;"></div></div>	MR57	172.17.1.32	MR 31.1.4	Q5BE	
<input type="checkbox"/>	✓	<b>Impala</b>	c4:14:a2:d2:b1:90	<div style="width: 100%;"><div style="width: 100%;"></div></div>	MR57	172.21.144.239	MR 31.1.4	Q5BE	
<input type="checkbox"/>	✓	<b>Fox</b>	68:49:92:ff:a7:e0	<div style="width: 100%;"><div style="width: 100%;"></div></div>	MR56	172.21.144.232	MR 31.1.4	Q5BC	

# Migration For Wi-Fi 7 APs (Only)

New in Dashboard: Building Better Alerting Experiences: An Overview of Enhanced Alert Features. [Read more.](#)

## Access Points

Last day

+ Add access point

Overview **List** Health Map Connection log Timeline

Recommendations from Network Like Yours **reduce latency by up to 40%** [Run diagnostics](#)

0 Offline

0 Repeaters

Download

Move Remove Migrate to WLC

### Migrate 1 access point to WLC Management Mode?

Device Name	Model	MAC	CloudID
VT-demo-unit	CW9176I	c4:14:a2:d2:a2:40	Q5BB-EP36-N96B

Cancel Migrate

### Migrate to WLC

Migrating a device will send it a signal to reboot in the WLC Management Mode. After it receives the signal and reboots, it will no longer be connected to Meraki Dashboard.

Cancel Migrate 1 access point

	Device Name	Model	MAC	Health	CloudID	IP	Status	Serial n
<input checked="" type="checkbox"/>	VT-demo-unit	CW9176I	c4:14:a2:d2:a2:40		CW9176I	172.17.30.17	Firmware version locked, please contact support	Q5BB-EP36-N96B
<input type="checkbox"/>	Aardvark		c4:14:a2:d2:7f:80		MR57	172.21.144.229	MR 31.1.4	Q5BB-EP36-N96B
<input type="checkbox"/>	Lemur		c4:14:a2:d2:b0:f0		MR57	172.17.1.32	MR 31.1.4	Q5BB-EP36-N96B
<input type="checkbox"/>	Impala		c4:14:a2:d2:b1:90		MR57	172.21.144.239	MR 31.1.4	Q5BB-EP36-N96B
<input type="checkbox"/>	Fox		68:49:92:ff:a7:e0		MR56	172.21.144.232	MR 31.1.4	Q5BC-EP36-N96B



# Migration For Wi-Fi 7 APs (Only)

New in Dashboard: Building Better Alerting Experiences: An Overview of Enhanced Alert Features. [Read more.](#)

## Access Points

Last day + Add access point

Overview **List** Health Map Connection log Timeline

0 Offline

0 Repeaters

Migrate 1 access point to WLC Management Mode?

✔ Migration successfully initiated

Download

Device Name	Model	MAC	CloudID	Cisco serial number
VT-demo-unit	CW9176I	c4:14:a2:d2:a2:40	Q5BB-EP36-N96B	WNT28110102

Close

1 Item

Move Remove Migrate to WLC

Serial n	Serial n
locked, please contact support	Q5BB-E
	Q5BB-F
	Q5BB-M
	Q5BC-I

<input type="checkbox"/>	✔	Aardvark	c4:14:a2:d2:7f:80	<div style="width: 100%;"></div>	MR57	172.21.144.229	MR 31.1.4	Q5BB-F
<input type="checkbox"/>	⊖	Lemur	c4:14:a2:d2:b0:f0	<div style="width: 0%;"></div>	MR57	172.17.1.32	MR 31.1.4	Q5BB-F
<input type="checkbox"/>	✔	Impala	c4:14:a2:d2:b1:90	<div style="width: 100%;"></div>	MR57	172.21.144.239	MR 31.1.4	Q5BB-M
<input type="checkbox"/>	✔	Fox	68:49:92:ff:a7:e0	<div style="width: 100%;"></div>	MR56	172.21.144.232	MR 31.1.4	Q5BC-I

# Unified Licensing

## One Hardware

Consistent SKU.

Choose Deployment Mode.

## One License

Single Cisco License per device  
that enables all management  
modes.

Common Licensing tiers  
(Essentials and Advantage) for  
both cloud and on-prem.

## One Support

Consistent and Reliable product  
support included in the Cisco  
Networking Subscription for  
hardware and software.

RMA Upgrade options for  
hardware.

# Wireless Controllers and Meraki Campus Gateway

# Cisco 9800 Wireless Infrastructure

Up to 100 APs



Embedded wireless controller (EWC)- Wi-Fi 6 only  
100 APs, 2000 clients

Embedded Wireless (Switch, SDA-only)  
200 APs



Up to 250 APs

C9800-L  
250 APs, 5000 clients,



Up to 1000 APs



C9800-40  
2000 APs, 32,000 clients

Up to 3000 APs



CW9800M  
3000 APs, 32,000 clients

New

Up to 6000 APs

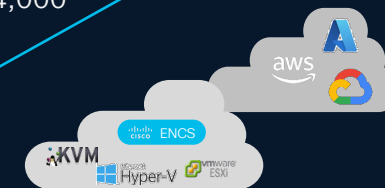
1RU



CW9800H1 / CW9800H2  
6000 APs, 64,000 clients,

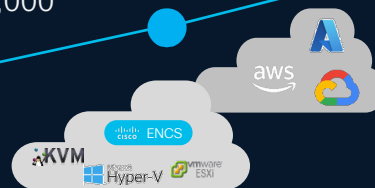
New

C9800-80  
6000 APs, 64,000 clients



C9800-CL  
1K, 3K, or 6K APs  
10K, 32K or 64K clients

C9800-CL  
1000 APs, 10,000 Clients



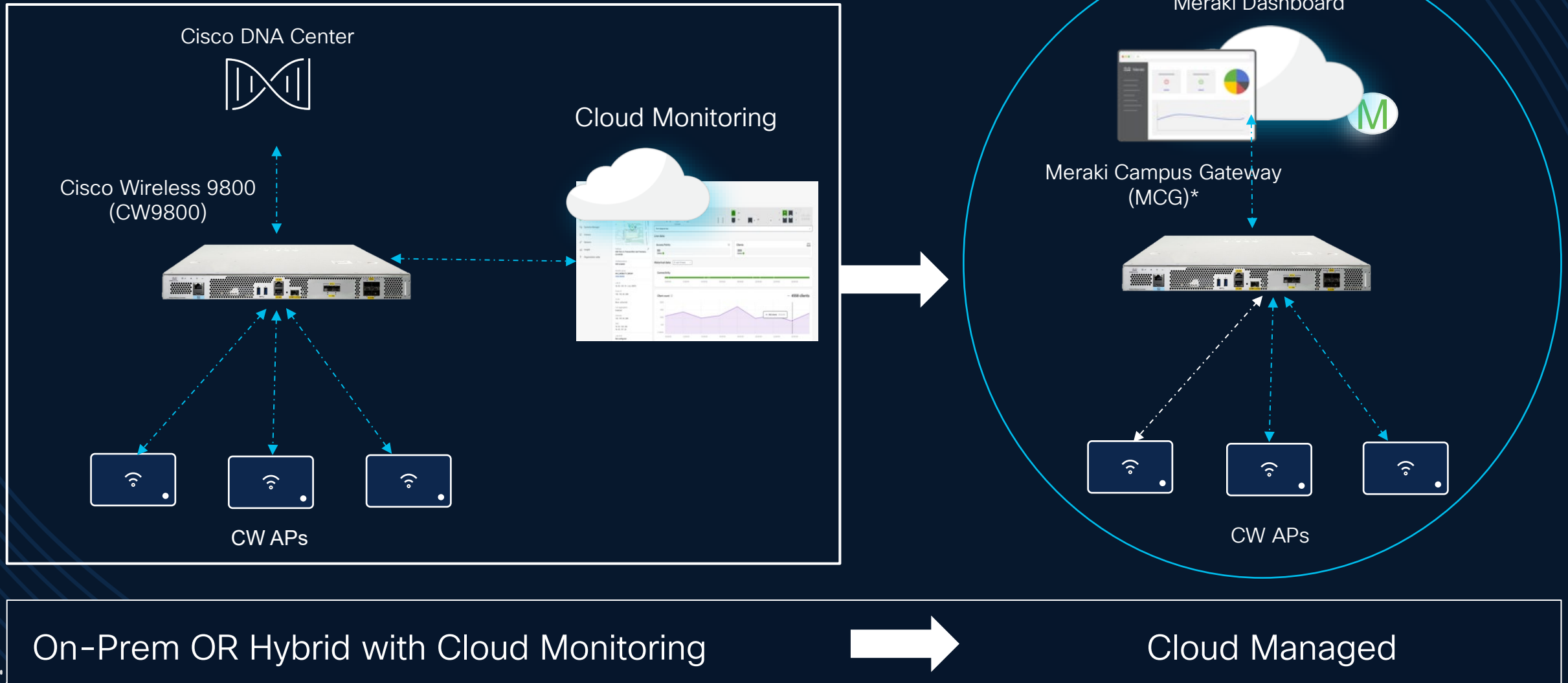
Distributed branch and small campus

Medium campus

Large campus

# Investment Protection

Start With On-Prem/Hybrid Today -> To Full Cloud Management with MCG



# Demo – Cloud Connected Controller

# Cisco PoE Innovations & Wi-Fi 7

UPoE

# More POWER!

Modern Cisco Access Points are supporting more hardware features than ever before.

## Radio Features

- Hexa-Radio Architecture with concurrent Quad-radio and 16SS
- Dual 5 GHz Radio
- Dedicated AI/ML-Driven Scanning Radio for Off-Channel Scanning
- USB 2.0 with 9W
- Dual 10 Gig Ethernet Port (PoE & Link Redundancy)
- Max Wi-Fi Clients: 1600 per AP (400 per radio)
- Antenna Gain: 2.4 GHz: 4dBi, 5 GHz: 5 dBi, 6GHz: 6dBi
- Max Tx Power: 2.4 GHz: 23 dBm, 5 GHz: 23 dBm, 6GHz: 23 dBm (FCC)



# 30W is Not Enough



# Power Considerations



802.3bt != More than 30W (!)



## Key Definitions

UPoE: Cisco speak for > 30W

802.3at: Maximum of 30W

802.3bt: Can do 30W and >30W

# AP Power Sustainability

Save Power, Reallocate Power, and Visibility Into Savings

## AP Power Save Mode

### Lower AP Power Usage

- Create a calendar profile for off-peak hours.
- Create a power profile to lower the power consumption budget during off-peak hours
- Power Profile: Shut AP Radios or lower spatial stream, lower port speed, disable USB Port.
- IOS-XE 17.8

## AP Power Distribution

### Control Over How Power is Used

- Reallocate extra AP Power to different radios while operating on PoE+ (30W)
- Customization of your PoE power budget.
- Example: Disable 2.4GHz and use extra power for 6GHz radio.
- IOS-XE 17.10

## AP Power Savings Insight

### Power, Money, and Emissions Savings in Cisco DNA Center

- Cisco DNA Center PoE Dashboard integration.
- Power Savings, Money Savings, Emissions Reductions
- Visibility into trends and insights
- Both site level and AP level view

# AP Power Save Mode

Total Potential Power Savings = 20%

- Goal is to **reduce power consumption** for APs during certain period of operations.
- **Power Saving Mode**: APs can switch to a lower power mode when no clients are associated
- Power saving mode is implemented via **Power Profiles** and **Calendar Profiles**.

# New Features in Cisco Wireless



# R31 Firmware Release Overview

Big Picture Feature Categories Are:

## Connectivity Enhancements

- AI-RRM on MR for AI Wireless Optimization
- Local Auth Enhancements
- 6GHz Support for additional countries who have approved 6GHz

## Specialty Functionality

- AP Autolocation aka “AnyLocate”
- MR as IoT Gateway for Assa Abloy door locks

## Security Enhancements

- WPA3 Enhancements (transition mode)
- RADSec API Enhancements
- Air Marshal Rogue Detection Enhancements
- HTTPS support for Local Status Page

# New MR Device Health Tab

## New Top-Down Assurance Overview to Single Device Troubleshooting Workflow

The screenshot displays the Cisco MR Device Health Tab for device AP35. The interface is organized into several sections:

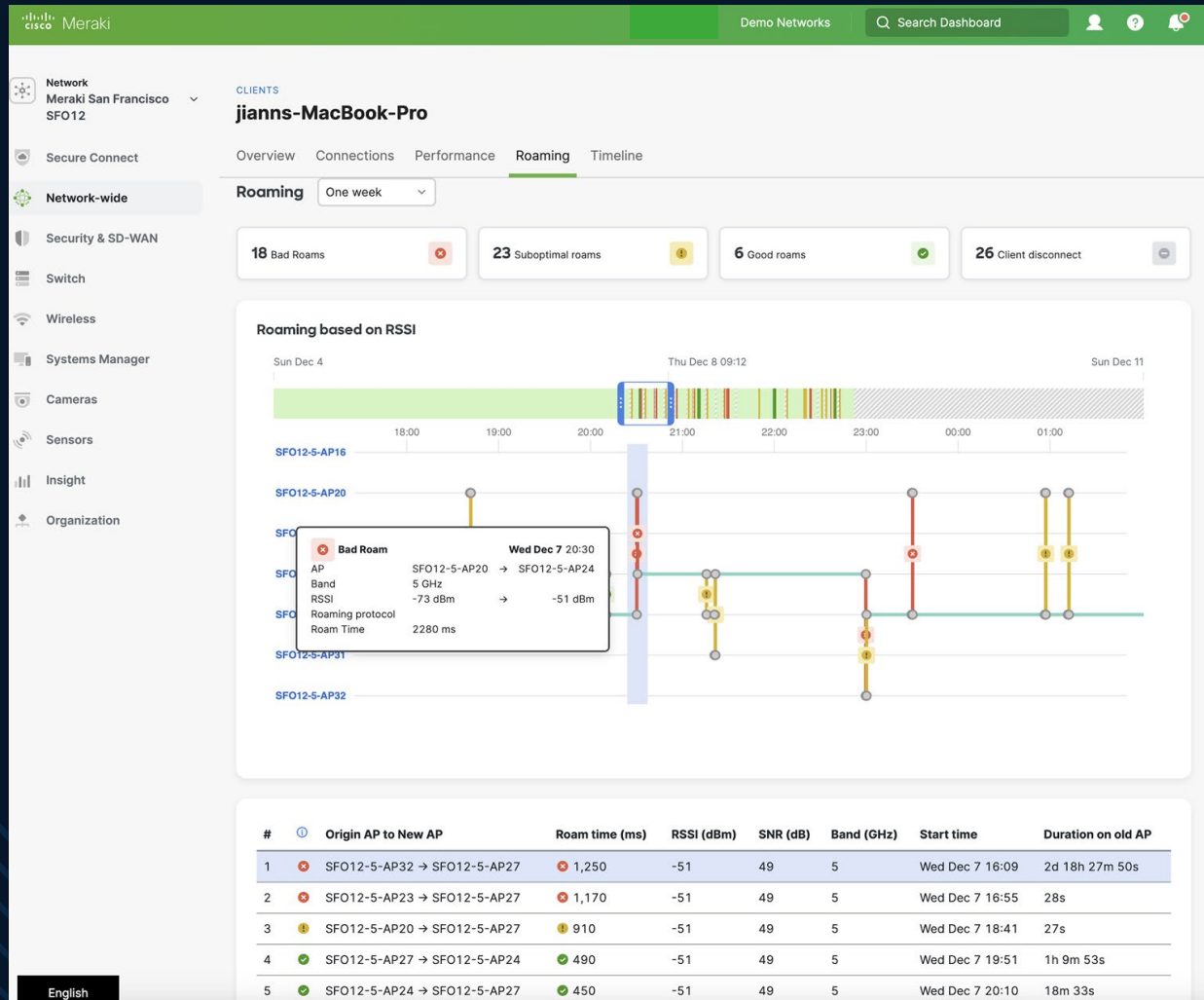
- Header:** Shows the device name "AP35" with an "Online" status and a "View old version" link.
- Navigation:** A menu bar includes "Summary", "Ports", "Health" (selected), "Event log", "Timeline", "Location", "Connections", "Performance", "Tools", and "LAN".
- System resources:**
  - CPU:** Status is "Poor". Metrics include 60 FPS Broadcast frame count (up 12% last day), 20 FPS Multicast frame count (up 12% last day), and 95% Utilization.
  - Memory:** Status is "Fair". Shows 30.6 MB out of 34 MB used, with a 90% utilization bar and a line graph showing usage over the last day.
- System status:**
  - Power mode:** Status is "Fair". A timeline shows power mode changes from 18:00 to 16:00, with categories for Planned low power, Unplanned low power, and Full power.
  - Power mode distribution last 24 hrs:** A donut chart shows 12% Unplanned, 43% Planned low power, and 60% Full power.
  - Unplanned reasons table:**

Unplanned reasons	Count
PoE negotiation failure	12
Limited PoE budget from Switch	6
Unknown Reason	5
PoE Injector Issue	3
AC Adapter Failure	1
<b>Total</b>	<b>28</b>
  - Disabled features table:**

Disabled features	Time
2.4 GHz radio	Today 3:13 pm
Scanning radio	Today 3:13 pm
Spatial stream	Today 3:13 pm
10 Gbps Ethernet	Today 3:13 pm
USB	Today 3:13 pm
BLE/IoT	Today 3:13 pm
- Configuration and Details (Left Sidebar):**
  - Address:** 500 Terry A. Francois Blvd, San Francisco, CA 94158
  - Device uptime:** 12d 2h 8m
  - Last device boot:** Jan 2 2024 11:02:01 (UTC-8)
  - Configuration:** Up to date (last fetched 10 minutes ago)
  - Firmware:** MR 30.4 (Update available, Upgrade complete)
  - SSIDs:** Corp-Guest (broadcasting), Corp-Guest V6, Corp 1234, Corp-Guest2.4, Corp-Engineering-SSO, blizzard, Corp-Guest-TA, Camera-Auth
  - Radio settings:** 2.4 GHz: 11 (20 MHz; 13 dBm), 5 GHz: 157 (40 MHz; 23 dBm), 6 GHz: —
  - LAN IPv4:** 192.195.83.200 (via DHCP)
  - Public IP:** 192.195.83.200



# Roaming Analytics



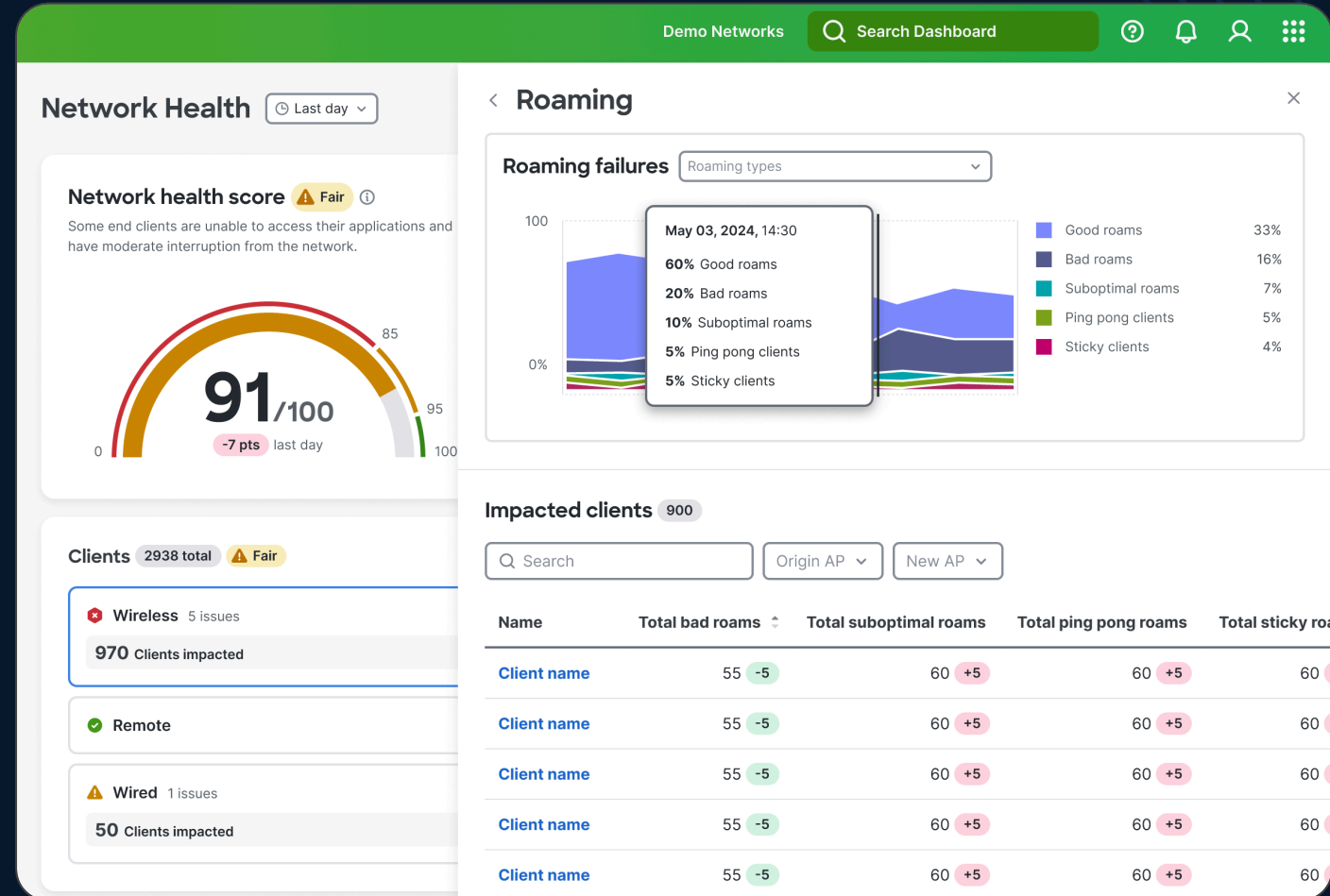
- Tiering of Roaming Events – Bad, Suboptimal, Good Roaming
- Contextual Roaming Events – Ping-Pong Client, Sticky Clients
- Historical Timeline up to a month
- Visualize Session Time and Roaming Experiences
- R29.x firmware requirements



# Roaming Health

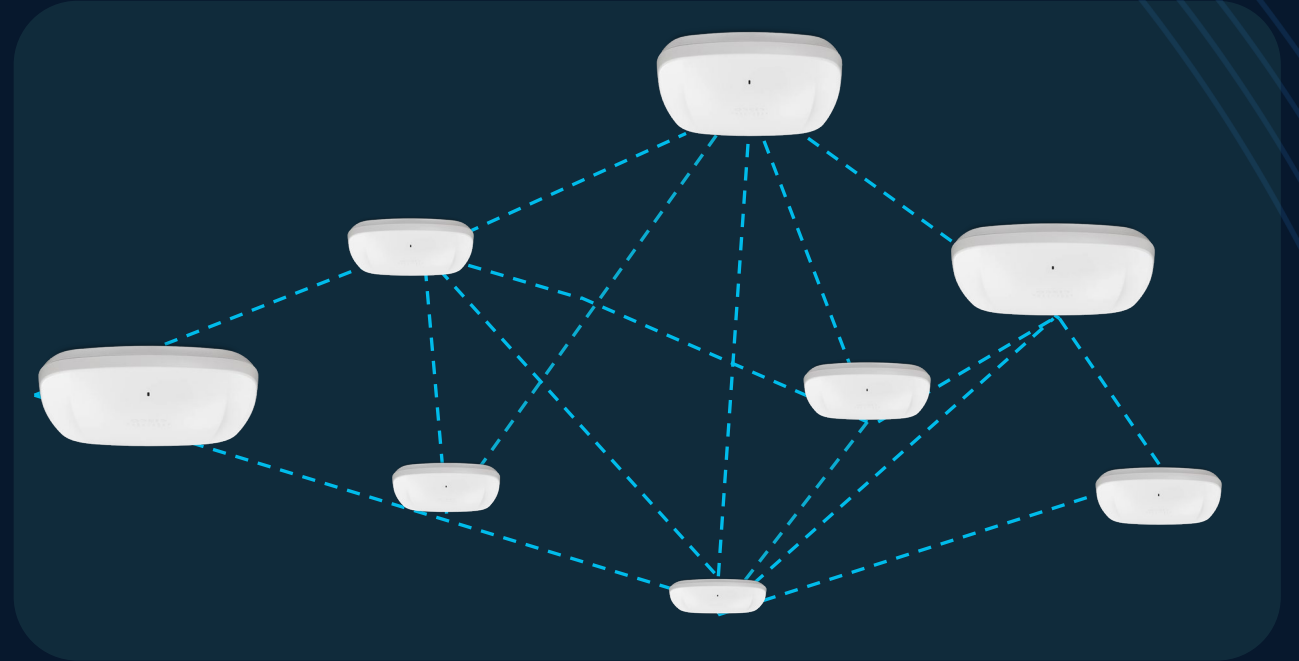
## On Assurance Overview

- Network-level view of all roaming event types
- Filter clients by name & physical APs clients are roaming between
- Brings users to the Roaming Analytics dashboard filtered at the same time



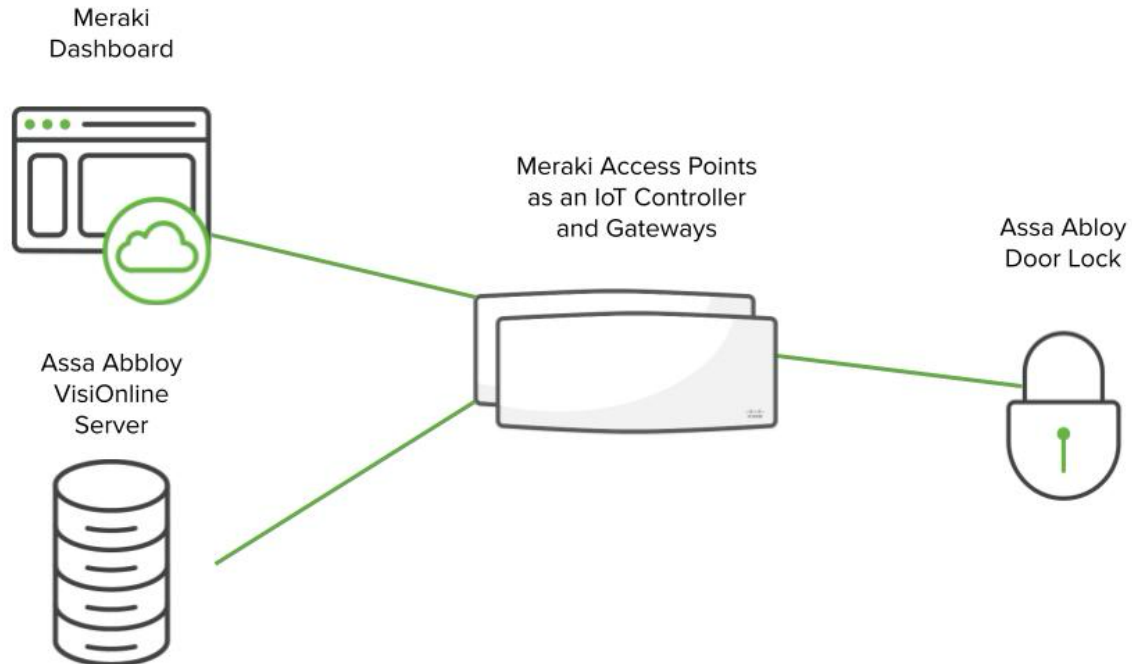
# AP Auto-Locate

- Use Fine Time Measurement and GPS to locate APs in a network and map them on a floor plan automatically.
- Improve client device location accuracy and reduce troubleshooting effort caused by incorrect AP placement.
- Reduce customer deployment time/complexity/cost.
- Hardware: MR78, MR36H, MR36, MR46, MR56, MR57, CW9162, CW9164, CW9166



# Assa Abloy Door Lock Integration

R31 – Private Beta



- Eliminates the need for a separate overlay network or extra hardware to connect with Assa Abloy door locks.
- The AP IoT radio functions as a Zigbee Gateway for door locks to connect back to a Visionline server.
- Dashboard provides visibility and insight into configured MR gateways and statuses of connected Assa Abloy door locks.

# Actions To Help Resolve Issues Quickly With Guidance and Validation



Simple: Easy to find and act upon



Trust: Evidence and suggestions for guidance



Validation: Instantly confirm if fixes are working

The screenshot displays the Cisco Meraki dashboard interface. At the top, there is a search bar and navigation links for 'Unsigned licenses', 'Announcements', and 'Help'. A yellow banner at the top right contains a critical security update for the MS390, advising users to upgrade to MS 14.32 firmware and reboot devices. Below this, the 'Health' section provides a summary of network components: 'UPLINK(S) 1/1 healthy', 'MX 1/1 healthy', and 'SWITCHES 3/5 healthy'. The 'Clients' section shows a line graph of network usage over the last 24 hours, with a total of 117.1 MB (46 MB down, 71.1 MB up). A table below the graph lists 4 client devices with columns for Status, Description, Last seen, Usage, Device type, OS, and IPv4 address.

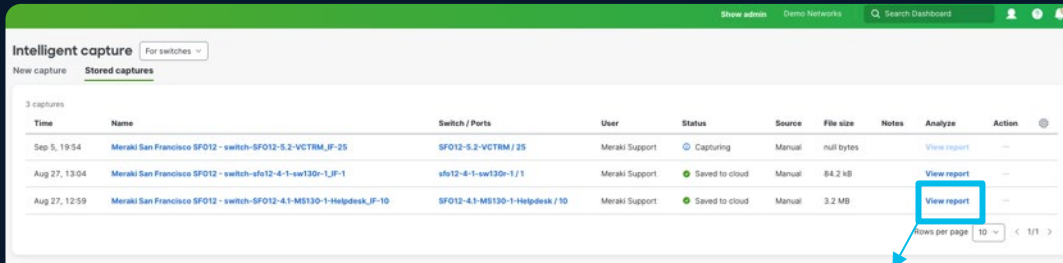
Status	Description	Last seen	Usage	Device type, OS	IPv4 address
<input type="checkbox"/>	[Redacted]	Feb 16 09:32	232 KB	Other	192.168.129.1
<input type="checkbox"/>	98:18:88:00:5b:81	Feb 16 09:14	113 KB	Other	192.168.128.155
<input type="checkbox"/>	[Redacted]	Feb 16 09:27	108 KB	Other	192.168.128.77
<input type="checkbox"/>	98:18:88:01:46:81	Feb 16 09:24	93 KB	Other	192.168.128.147

# Intelligent Capture

## Maximize Operational Efficiency

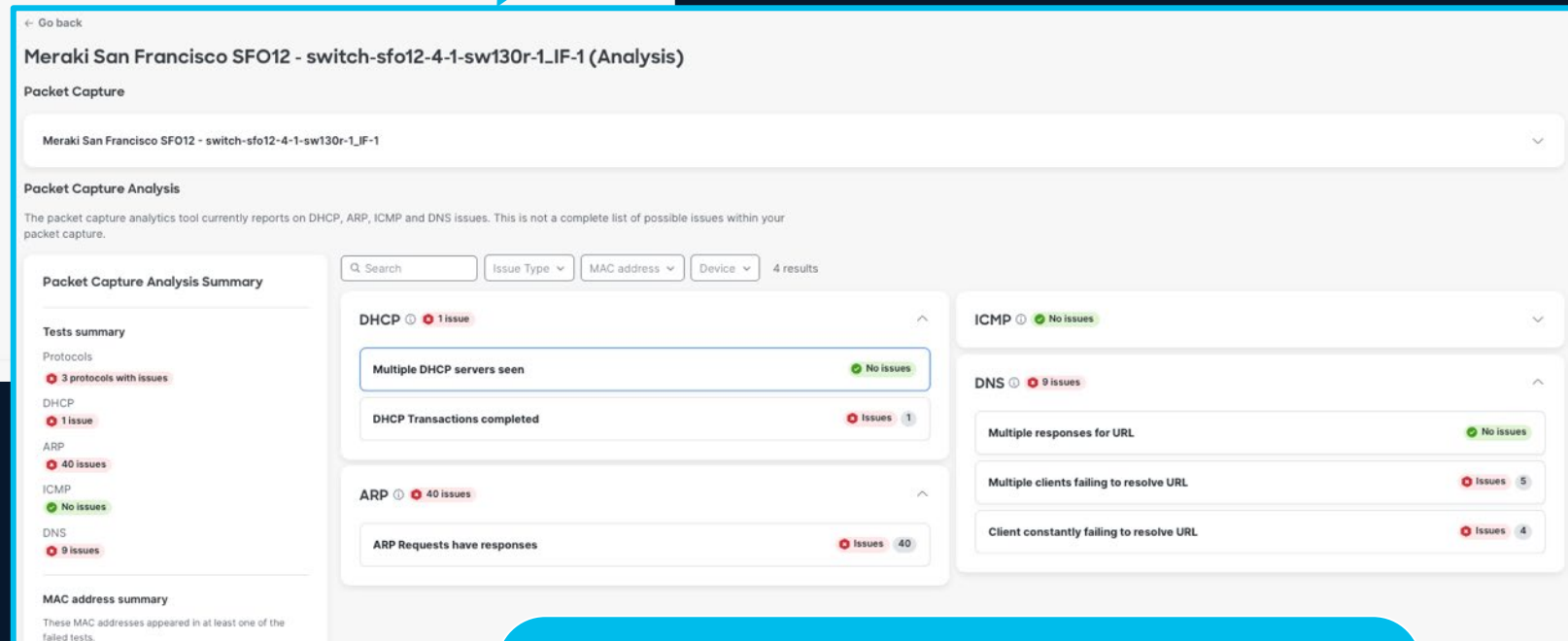
- View, store, or download securely in one central platform

Streamline troubleshooting workflow with a built-in packet analysis tool



The screenshot shows the 'Intelligent capture' dashboard with a table of stored captures. A blue box highlights the 'View report' link for the capture dated Aug 27, 12:59.

Time	Name	Switch / Ports	User	Status	Source	File size	Notes	Analyze	Action
Sep 5, 19:54	Meraki San Francisco SFO12 - switch-SFO12-5-2-VCTRM_IF-25	SFO12-5-2-VCTRM / 25	Meraki Support	Capturing	Manual	null bytes		<a href="#">View report</a>	
Aug 27, 13:04	Meraki San Francisco SFO12 - switch-sfo12-4-1-sw130r-1_IF-1	sfo12-4-1-sw130r-1 / 1	Meraki Support	Saved to cloud	Manual	84.2 kB		<a href="#">View report</a>	
Aug 27, 12:59	Meraki San Francisco SFO12 - switch-SFO12-4-1-M5130-1-Helpdesk_IF-10	SFO12-4-1-M5130-1-Helpdesk / 10	Meraki Support	Saved to cloud	Manual	3.2 MB		<a href="#">View report</a>	



The screenshot shows the analysis page for a packet capture. It includes a 'Packet Capture Analysis Summary' section with a 'Tests summary' and a 'MAC address summary'. The 'Tests summary' shows results for DHCP, ARP, ICMP, and DNS. The 'MAC address summary' shows MAC addresses that appeared in at least one of the failed tests.

### Meraki San Francisco SFO12 - switch-sfo12-4-1-sw130r-1\_IF-1 (Analysis)

Packet Capture

Meraki San Francisco SFO12 - switch-sfo12-4-1-sw130r-1\_IF-1

Packet Capture Analysis

The packet capture analytics tool currently reports on DHCP, ARP, ICMP and DNS issues. This is not a complete list of possible issues within your packet capture.

Packet Capture Analysis Summary

Search [ ] Issue Type [ ] MAC address [ ] Device [ ] 4 results

Tests summary

Protocols

- 3 protocols with issues
- DHCP: 1 issue
- ARP: 40 issues
- ICMP: No issues
- DNS: 9 issues

MAC address summary

These MAC addresses appeared in at least one of the failed tests.

DHCP 1 issue

- Multiple DHCP servers seen (No issues)
- DHCP Transactions completed (Issues: 1)

ARP 40 issues

- ARP Requests have responses (Issues: 40)

ICMP No issues

DNS 9 issues

- Multiple responses for URL (No issues)
- Multiple clients failing to resolve URL (Issues: 5)
- Client constantly failing to resolve URL (Issues: 4)

View built-in packet analysis report

# Packet Capture Analysis - Beta

Quick and simple identification of issues at a packet level



- Quickly analysis common issues such as DHCP, ARP, ICMP
- Uploaded, scheduled, or proactive captures
- Review findings and evidence

**Packet Capture Analysis Summary**

**Tests summary**

Protocols

- 3/3 protocols failed

DHCP

- 1/2 tests failed

ARP

- 1/1 tests failed

ICMP

- 2/2 tests failed

**MAC address summary**

These MAC addresses appeared in at least one of the failed tests.

- 6c:7f:0c:0a:60:38
- a8:46:9d:fc:dd:59
- 2c:3f:0b:d4:95:e9
- 00:1f:ca:b3:31:c0
- 52:54:dd:99:3b:a8
- e0:d3:b4:fd:96:74
- 68:3a:1e:0a:1c:f6

**Device summary**

These devices appeared in at least one of the failed tests.

- Switch E
- Switch C - SPARE
- Switch H

**DHCP** 1/2 tests failed

- Multiple DHCP servers seen All tests passed
- DHCP Transactions completed Failed 12

**ARP** 1/1 tests failed

**Missing ICMP responses**

**ICMP request to 8.8.8.8 has no response**

**Packets** 2, 7, 51, 117, 128, 138, 160, 187, 232, 252, 264, 303, 317, 368, 388, 408, 450, 470, 516, 562, 574, 594, 604, 623, 674, 685, 702, 715, 753, 796, 806, 819, 832, 869, 917, 931, 981, 1006, 1027, 1069, 1086, 1116, 1139, 1161, 1183, 1255

**Details** ICMP request failed from 172.20.193.76 to 8.8.8.8

**ICMP request to 172.20.193.81 has no response**

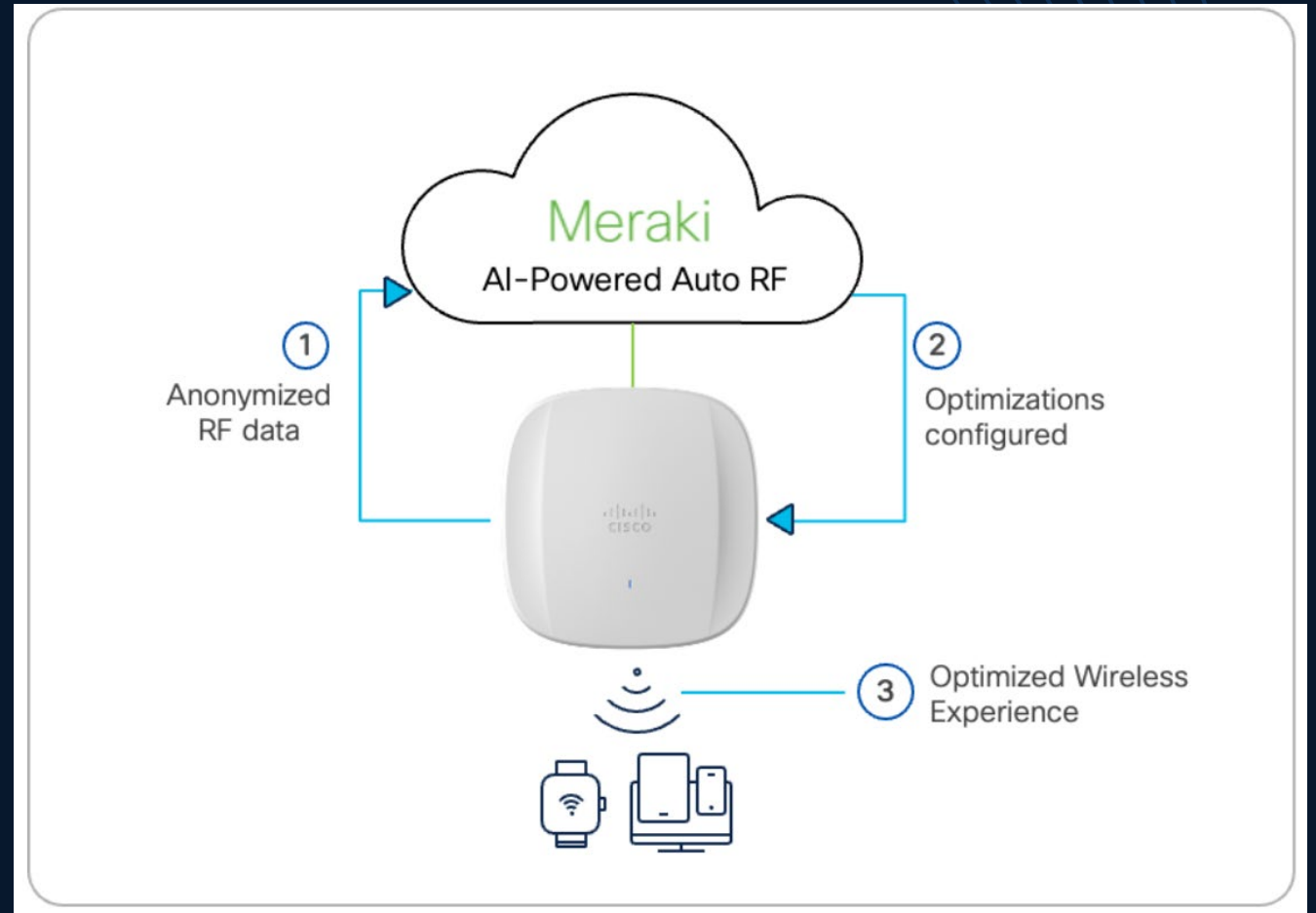
**Packets** 4, 46, 98, 121, 129, 146, 181, 221, 244, 254, 297, 310, 328, 377, 395, 432, 461, 473, 536, 565, 588, 598, 606, 653, 676, 689, 705, 744, 791, 801, 810, 821, 854, 903, 921, 937, 999, 1016, 1042, 1075, 1094, 1129, 1153, 1165, 1243

**Details** ICMP request failed from 10.92.135.56 to 172.20.193.81

# Demo - Packet Capture Analysis

# Intelligent AI/ML AutoRF

- Tens of Millions of Cisco APs online and reporting RF metrics
- AI looks back at 6 weeks of historical data
- Optimizes Channel and Power plan based on unique RF Environment



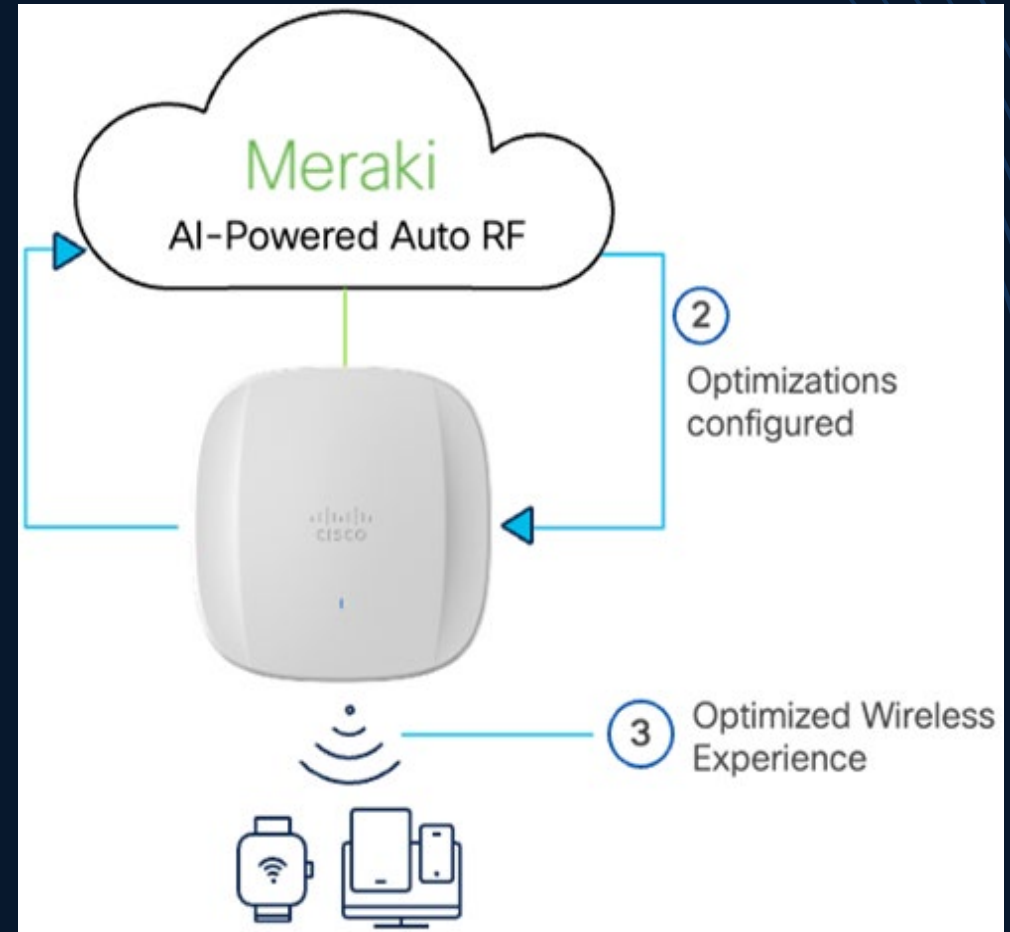


# AI-RRM For Cisco Wireless

- New telemetry Data is sent from APs to the cloud for enhanced RRM decisions

**NEW**

- Neighbor Discovery Protocol
- Interference Duty Cycle
- Noise Floor
- Channel Utilization
- AP Neighbor
- AP Radio Channel Power
- AP Radio
- AP Channel
- RRM Measurement Interference
- RRM Measurement Noise
- RRM Coverage Client Info
- RRM Measurement Load



# AI-Enhanced RRM Significantly Improves Cisco Wi-Fi

## Trend-based RRM

Optimize RF with two weeks of data enabling more sophisticated and efficient RRM optimization.

## Flexible radio assignment

Place radios on the most optimal band/mode to minimize interference on 2.4 GHz at the touch of a button.

## Enhanced busy hour

Optimizations are deferred until after the busy hour, using busy hour data, rather than just suppressed.

### Radio Settings

Overview RF Profiles **AI-RRM**

#### Trend-based RRM

Enable

Trend-based RRM uses an AI engine to improve the performance of your network ⓘ

#### Flexible radio assignment

Enable FRA

FRA optimizes the 2.4 GHz band by strategically disabling redundant radios to reduce interference ⓘ

#### AI channel planning

Enable AI channel planning

Improved Channel Assignment by leveraging artificial intelligence to optimize channel planning capabilities ⓘ

#### Busy hour

Enable busy hour

AI-RRM will minimize changes during the most active hours of the day ⓘ

Sensitivity ⓘ  Low  Medium  High

#### Auto schedule

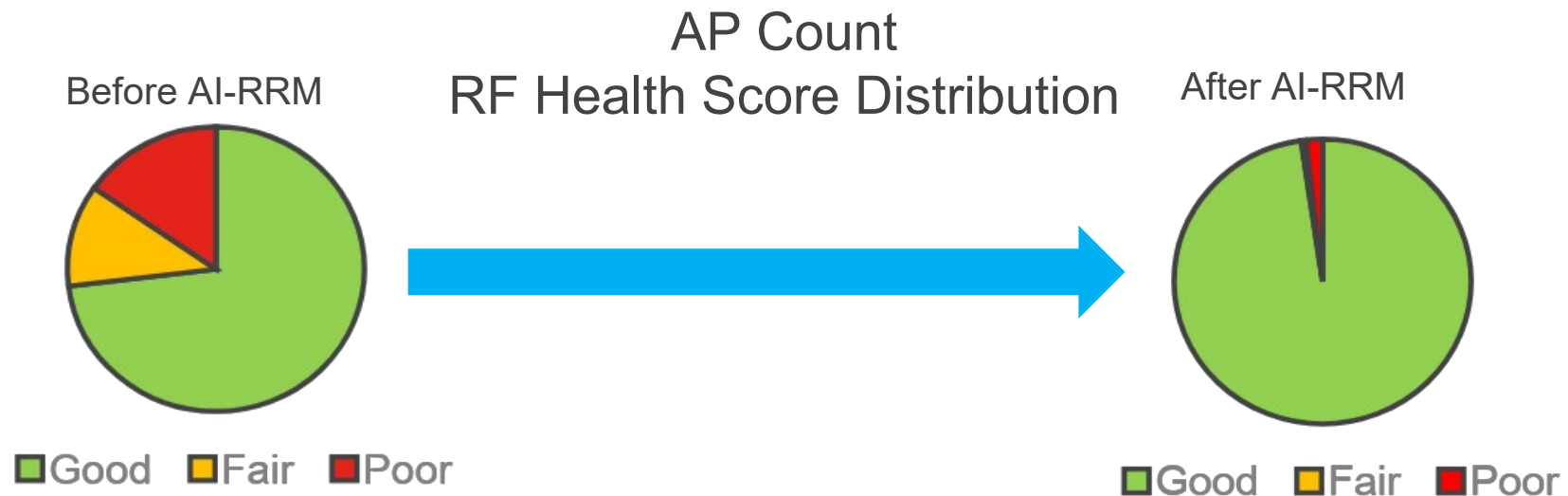
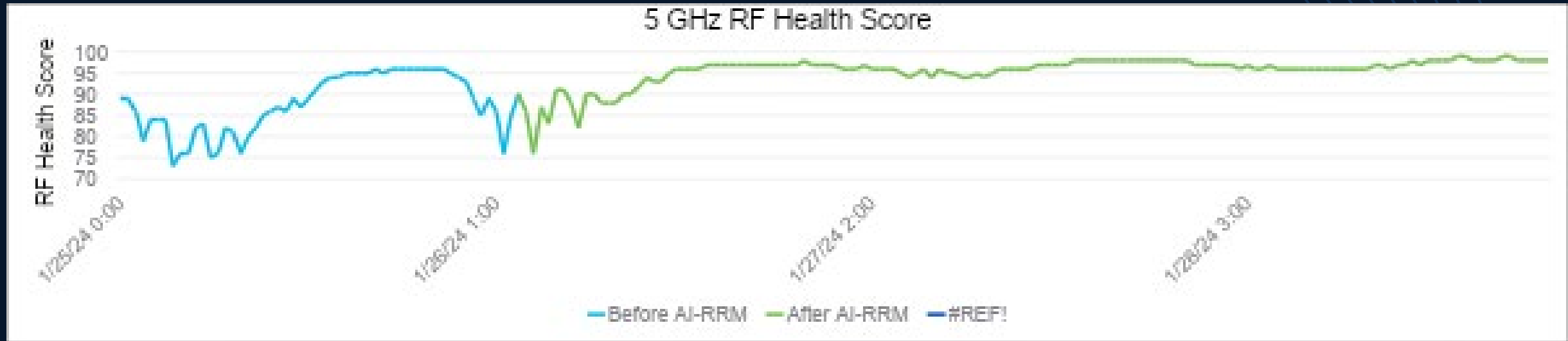
Based on historical data of up to the last 6 weeks ⓘ

23:00 → 08:00 ⓘ

#### Manual schedule

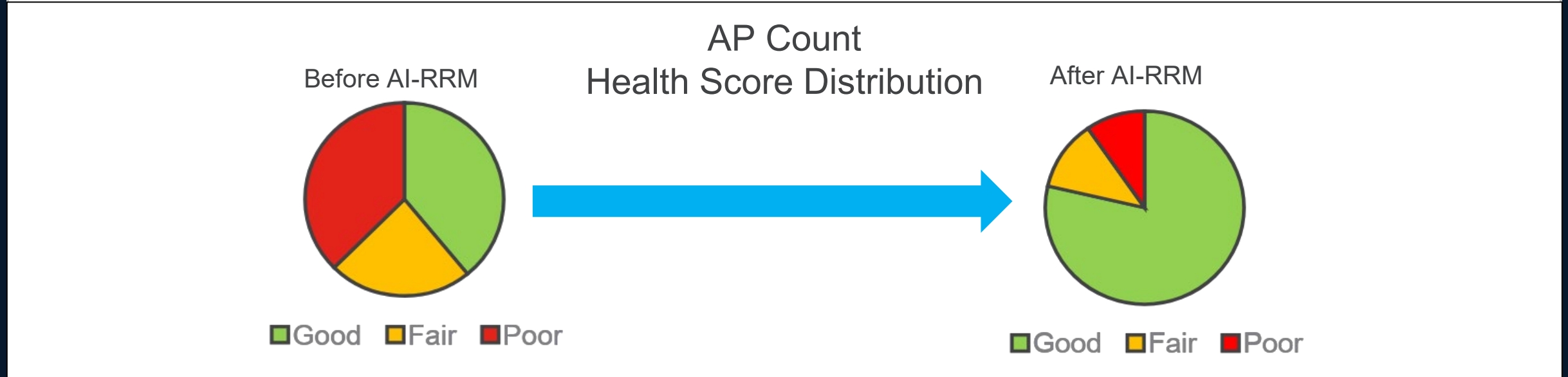
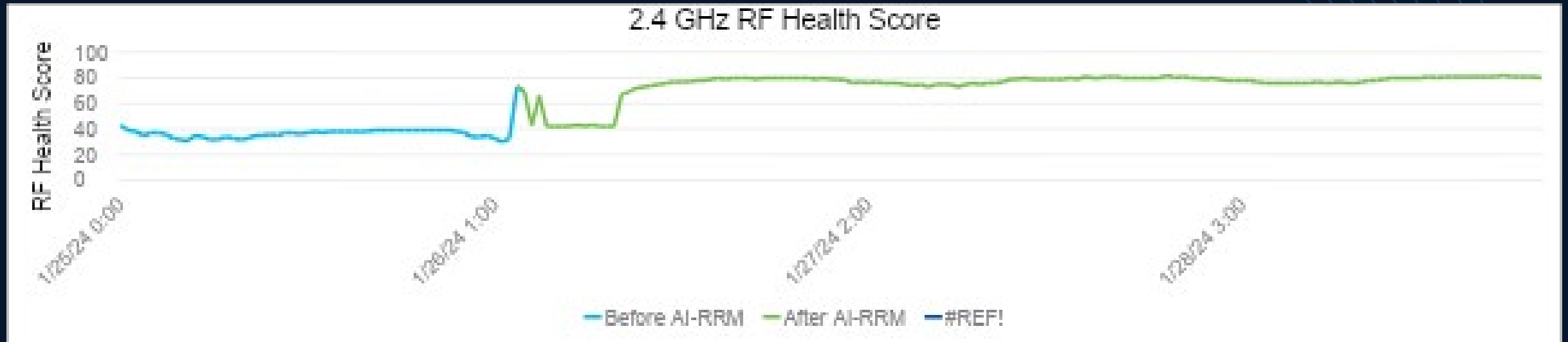
# Trend-Based RRM Improved a Large University in Japan

5GHz Network of 776 APs



# Trend-Based RRM Improved a Large University in Japan

2.4GHz Network of 776 APs



# The Cisco Unified AI Assistant Vision

## Security, Networking, Observability, Collaboration

### Objective

Develop an AI Assistant with the intelligence of all platforms across Cisco to create a cohesive ecosystem.

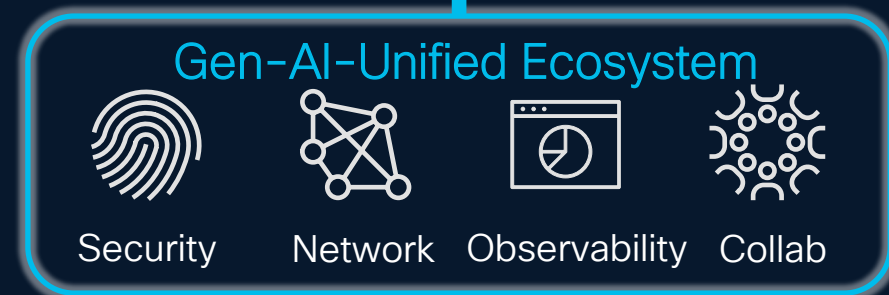
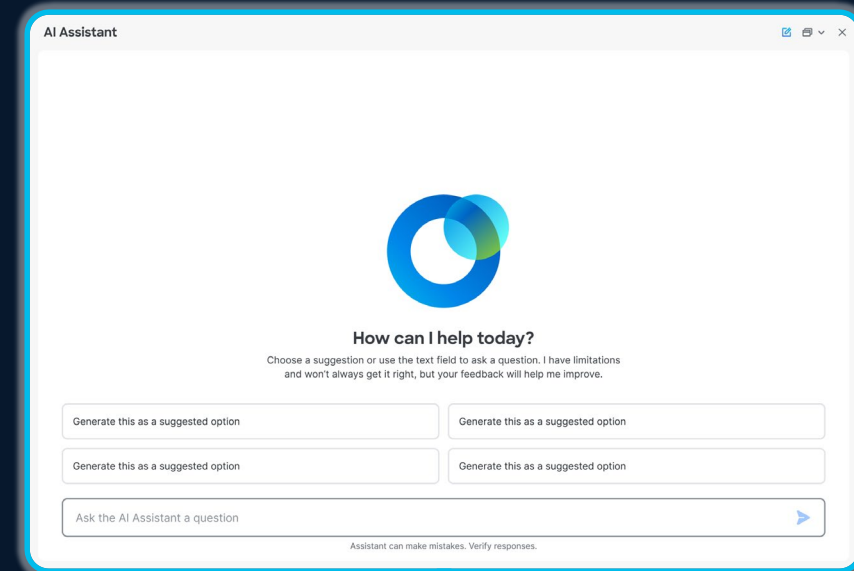
### Customer Outcome

Reduces the MTTR or MTTI, lessening IT operational overhead.

### Target Use Cases

Inter-product troubleshooting, configuration, optimization, doc skills.

## Gen-AI-Powered AI Assistant



# AI Assistant for Network Assurance

## Network visibility and configuration

- Improved productivity

## Network diagnostics

- Assurance workflows and insights
- RCA and troubleshooting flows

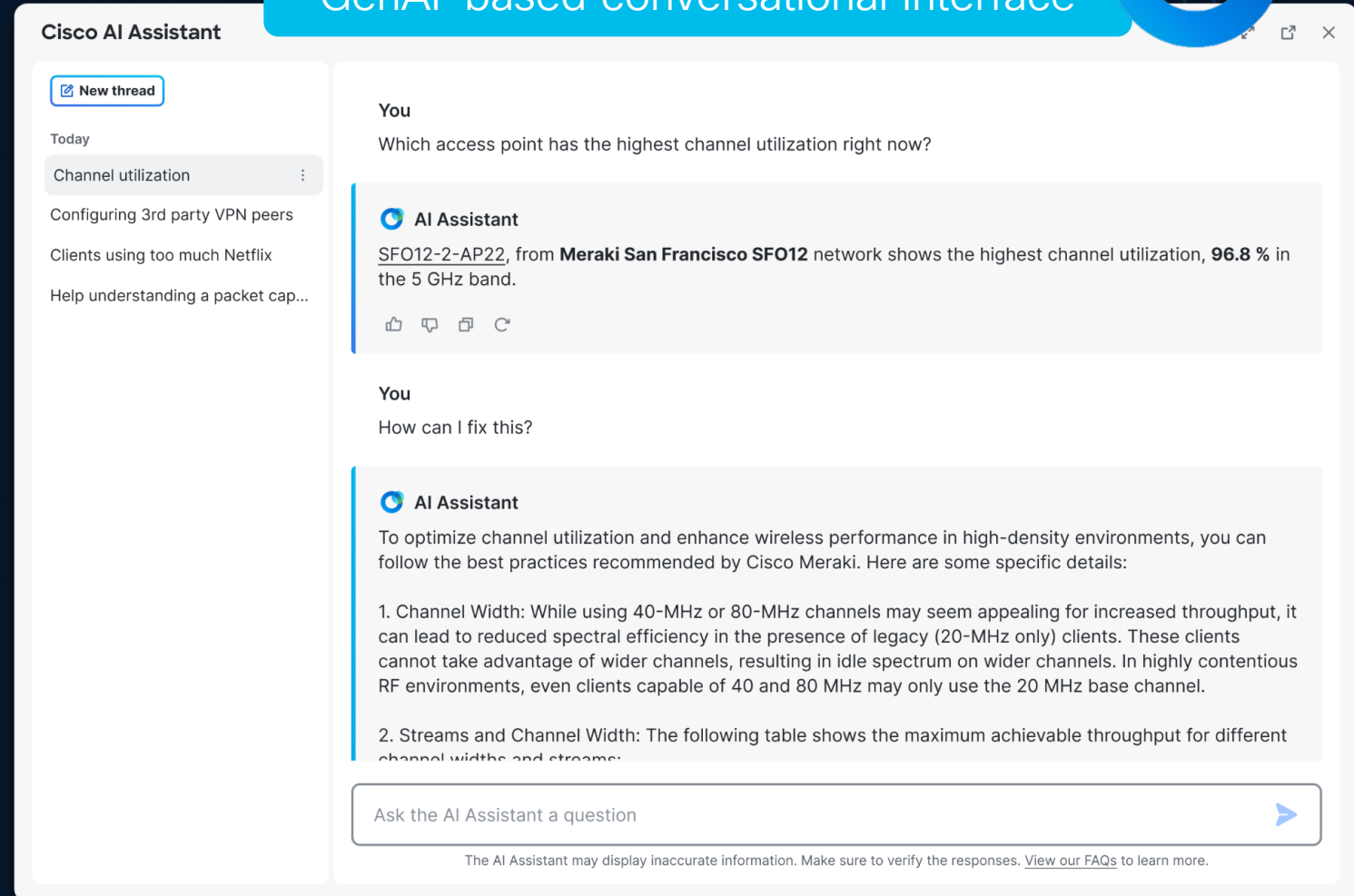
## Network optimization

- Personalized best practices

## Documentation summarization

- Context-aware and personalized

## GenAI-based conversational interface



The screenshot displays the Cisco AI Assistant interface. On the left, there is a sidebar with a 'New thread' button and a list of topics under 'Today': 'Channel utilization', 'Configuring 3rd party VPN peers', 'Clients using too much Netflix', and 'Help understanding a packet cap...'. The main chat area shows a conversation. The user asks, 'Which access point has the highest channel utilization right now?'. The AI Assistant responds with a blue bubble: 'SFO12-2-AP22, from Meraki San Francisco SFO12 network shows the highest channel utilization, 96.8 % in the 5 GHz band.' Below this, the user asks, 'How can I fix this?'. The AI Assistant responds with a blue bubble: 'To optimize channel utilization and enhance wireless performance in high-density environments, you can follow the best practices recommended by Cisco Meraki. Here are some specific details: 1. Channel Width: While using 40-MHz or 80-MHz channels may seem appealing for increased throughput, it can lead to reduced spectral efficiency in the presence of legacy (20-MHz only) clients. These clients cannot take advantage of wider channels, resulting in idle spectrum on wider channels. In highly contentious RF environments, even clients capable of 40 and 80 MHz may only use the 20 MHz base channel. 2. Streams and Channel Width: The following table shows the maximum achievable throughput for different channel widths and streams:'. At the bottom, there is a text input field with a blue arrow button and a disclaimer: 'The AI Assistant may display inaccurate information. Make sure to verify the responses. View our FAQs to learn more.'

# Smart Spaces with Wi-Fi 7





# Ultra Wide-Band (UWB) Overview

Short Range, High Frequency wireless that enables precision location



## Built In

Embedded in 9176 and 9178 APs

## Precision

More location precision compared to BLE

## Power Savings

Battery efficient in tags and mobile devices

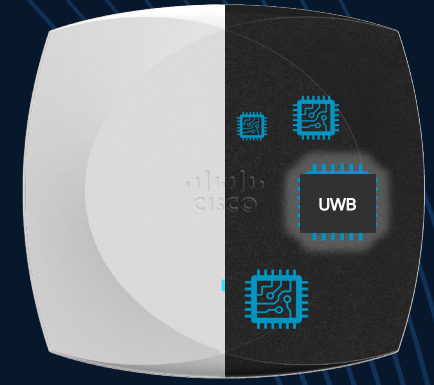
## New Use Cases

Supports new use cases and improves upon existing solutions

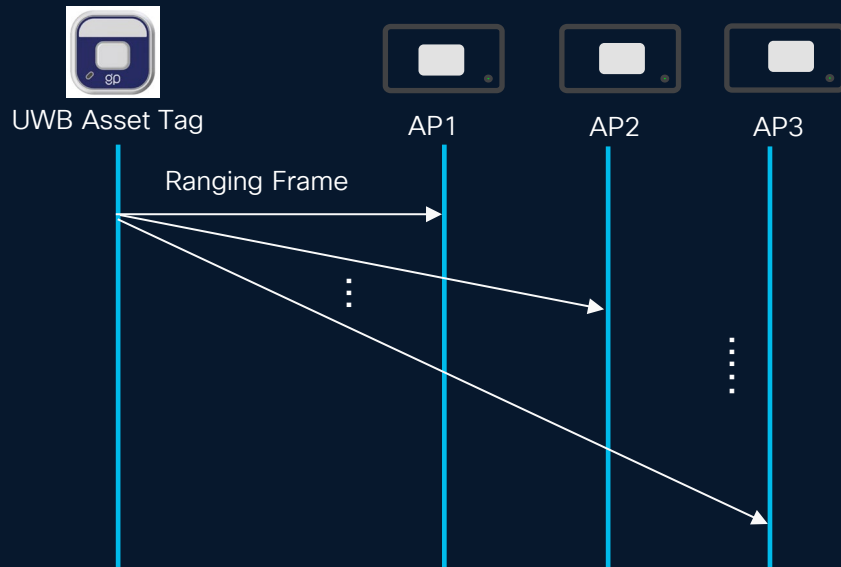


# Ultra Wide-Band (UWB) Overview

- UWB is a short-range, high-frequency wireless technology that enables location precision on a sub-meter level
- UWB solves your accuracy problems and is very battery efficient in tags and mobile devices
  - Current Support: Ch9 @ 7.737-8.237GHz (500MHz bandwidth)
  - No impact on Wi-Fi

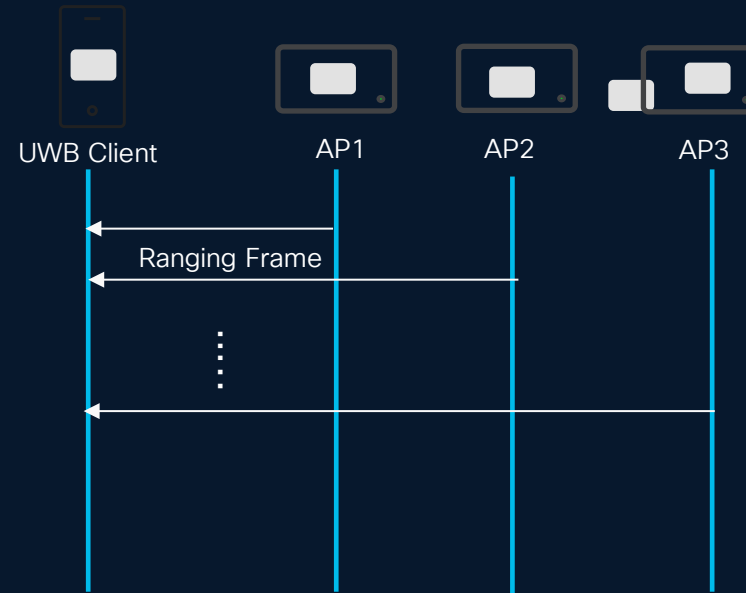


## 1 UL - TDoA: Asset Tracking



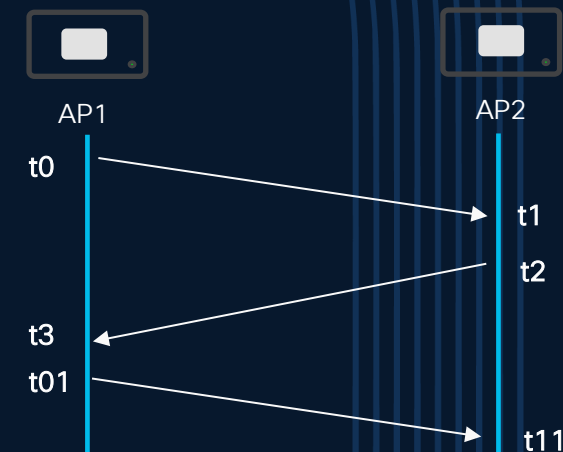
Planned: 2HFY25

## 2 DL - TDoA: Wayfinding



Planned: 2HFY25

## 3 Two Way Ranging: AP Auto Location



$$d = \text{ToF} \times c(\text{Speed of Light})$$
$$\text{ToF} = [(t3 - t0) - (t2 - t1) + (t11 - t2) - (t01 - t3)] / 4$$

Availability: Nov 2024

# Wi-Fi 7 – The Network for Smart Spaces

## HW Foundation

### 1. Super Charge Your Buildings



HIGH SPEED

MASSIVE CAPACITY

ULTRA LOW LATENCY

OUTCOMES READY

With  
**Cisco Wi-Fi 7** Access Points  
as the foundation

## SW Platform

### 2. Turn them into Smart Spaces



MAPS  
AI Powered 3D  
Mapping

LOCATION  
WIFI, BLE & UWB

IoT  
Management

With  
**Cisco Spaces**  
Part of Cisco Networking Cloud

## Outcomes

### 3. Deliver Unmatched Experiences



With  
**NG Smart Spaces Apps**  
Native & Partner

# Your Network Becomes a Sensor for Smart Spaces

with **cisco**  
**SPACES**



Cisco Collaboration  
Devices

Room occupancy

People count

Air Quality

Temp, Humidity

Ambient noise

Desk Utilization

Desk Reservation



Cisco Switches

Occupancy

IoT gateway



Meraki MT sensors  
& cameras

People count

Air quality

CO2

Temp, humidity



Cisco Access Points

Location

Occupancy

Sensor gateway



Asset Tags

Location



Environmental  
Monitors

Temp, humidity

CO2, Air quality



Panic Buttons

Button Alert,  
Location



Occupancy  
(wired & wireless)

People Count

Presence



# Cisco Spaces

Common Framework for Location. Maps. IoT. API.



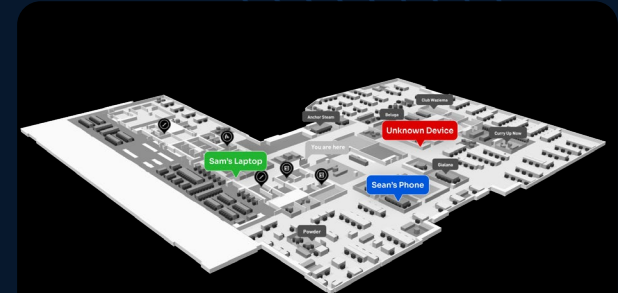
Auto Placement of APs on map for IT teams



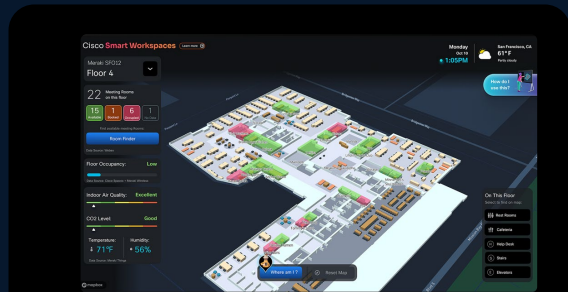
Place Sensors on a map for IT teams



Detect & Locate Clients & Devices for IT/OT Teams



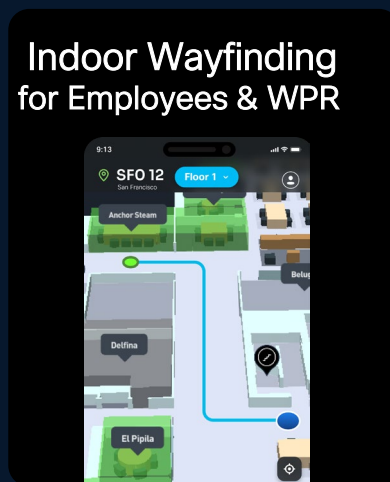
Asset Tracking for Operations



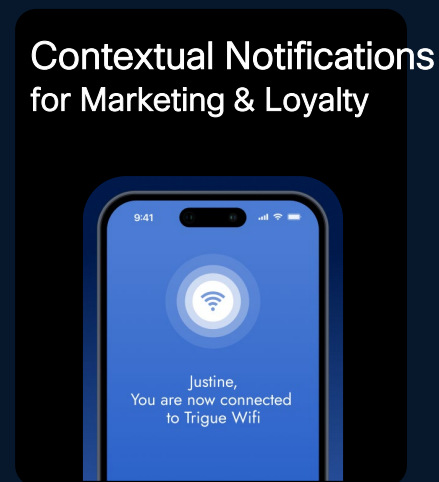
Digital Signage Experience for Employees & Facilities Teams



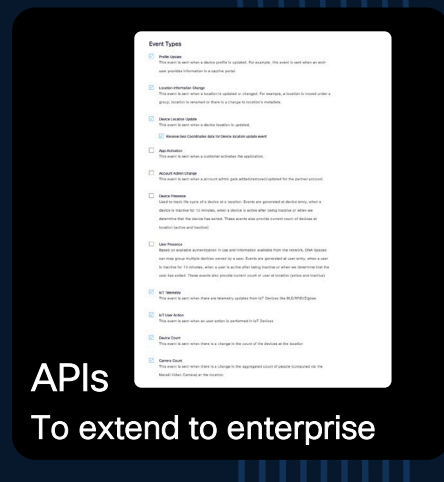
Occupancy Analytics for Real-Estate & Facilities



Indoor Wayfinding for Employees & WPR



Contextual Notifications for Marketing & Loyalty



APIs To extend to enterprise



