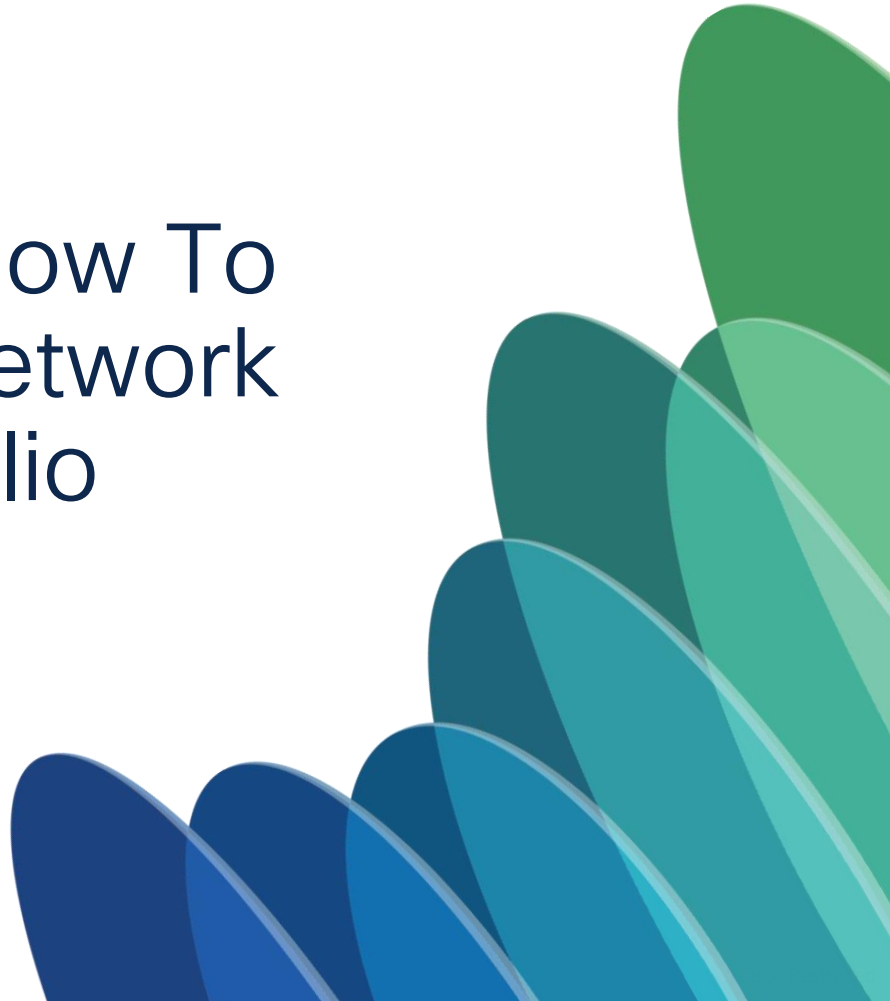
Wireless Wonders: How To Build Your Wi-Fi 7 Network with the Cisco Portfolio

Maren Kostede - Solutions Engineer
EMEA Networking Sales

BRKEWN-1722



Agenda

1. Wi-Fi 7 & APs
2. Platform Choices
3. Simplified Operation

4. Location Services
5. Secure!
6. Built in IoT

Webex App

Questions?

Use the Webex app to chat with the speaker after the session

How

1. Find this session in the Cisco Events mobile app
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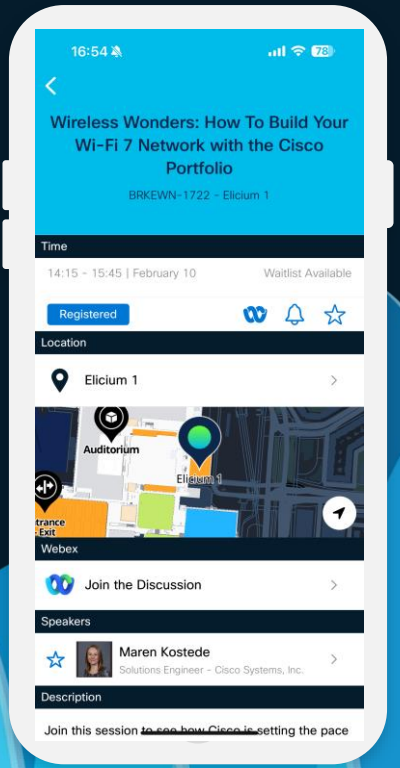

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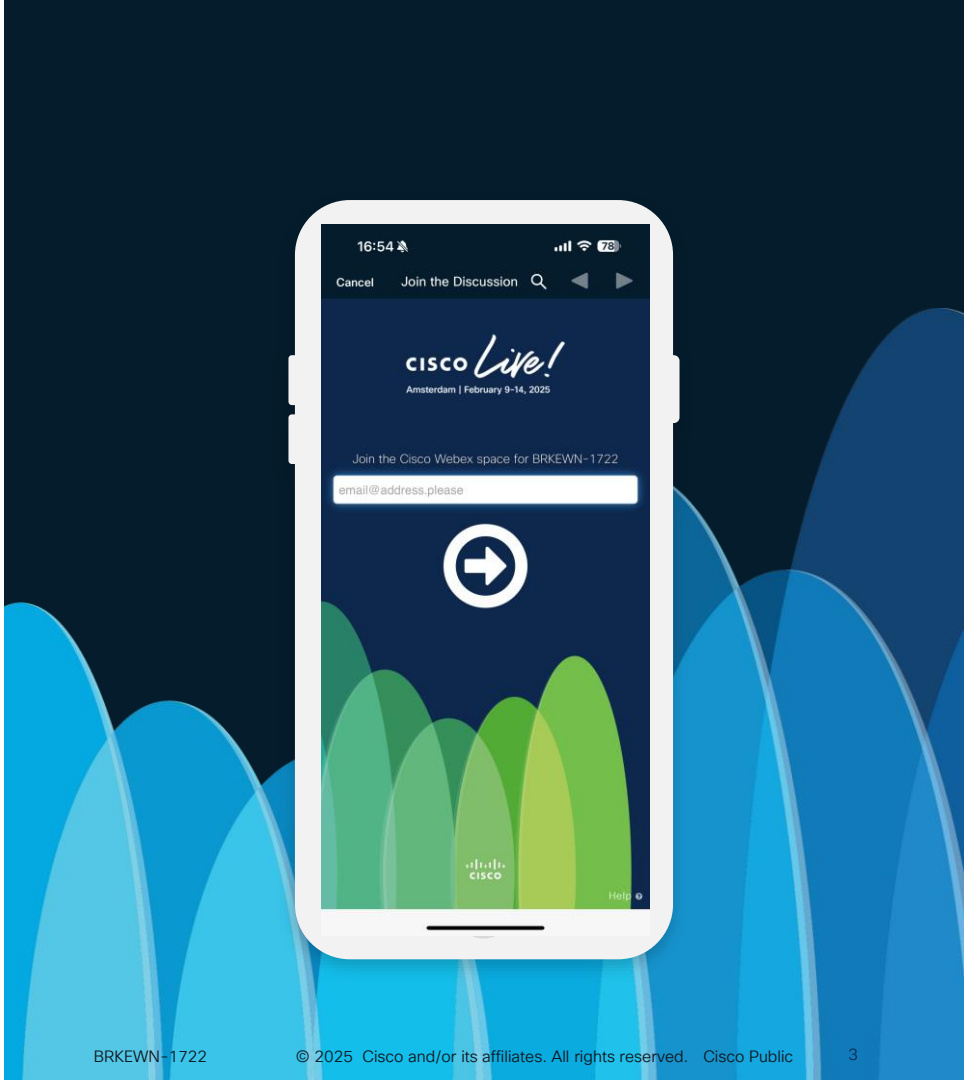


… about Maren

- joined Cisco in 2005
- Systems Engineer/ Wireless Specialist for Northern Germany
- 2018 Technical Catalyst Wireless Sales lead for Cisco EMEAR
- 2024 Technical Lead Cisco Wireless & Platforms EMEA

› Mom

› Traveling

› Hamburg/ Germany

› Sailing

Since 2024 ☺

Cisco Live 2016

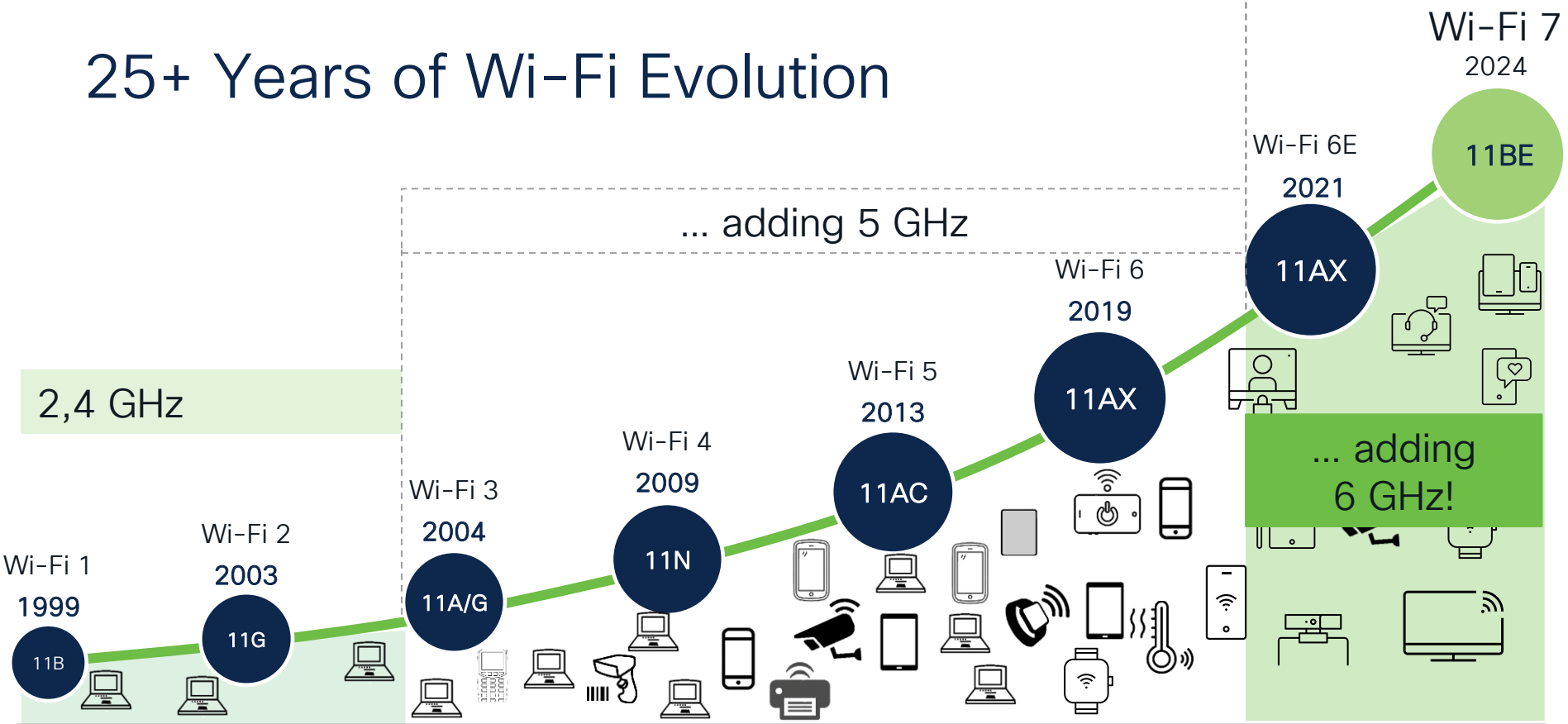
cisco Live!

Agenda

1. Wi-Fi 7 & APs
2. Platform Choices
3. Simplified Operation

4. Location Services
5. Secure!
6. Built in IoT

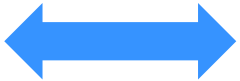
25+ Years of Wi-Fi Evolution



Datarate: 11 Mbps (max) 2.4 GHz Band	Date Rate: 54 Mbps (max) 2.4 GHz Band	Date Rate: 54 Mbps (max) 5 GHz Band	Date Rate: 600 Mbps (max) 2.4, 5GHz Band	Date Rate: 7 Gbps (max) 5 GHz Band	Date Rate: 9.6 Gbps (max) 2.4, 5GHz Band	Date Rate: 9.6 Gbps (max) 6 GHz	Data Rate: 30 Gbps (max) 2.4, 5, 6 GHz Band

What is new in Wi-Fi 7 (IEEE 802.11be)?

6 GHz Spectrum

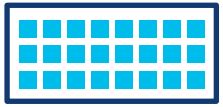


320 MHz in 6 GHz
160 MHz in 5 GHz

4K QAM

MLO

Enhanced Security



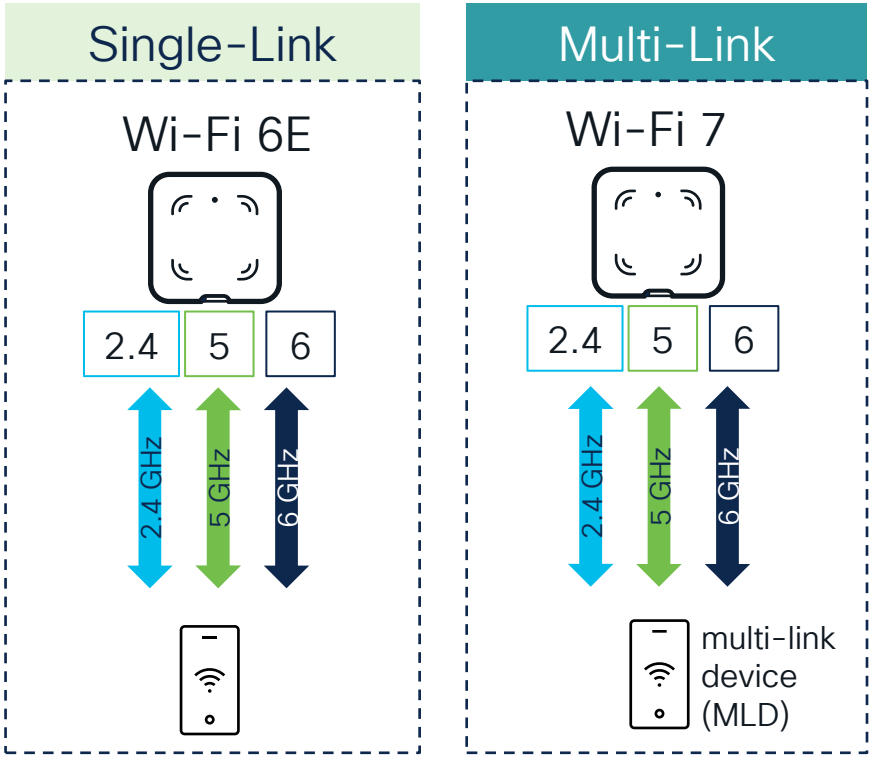
Compressed Block Ack

Multi-RU

Preamble puncturing
Mandatory in Wi-Fi 7. Optional in Wi-Fi 6
Min ch. width of 80

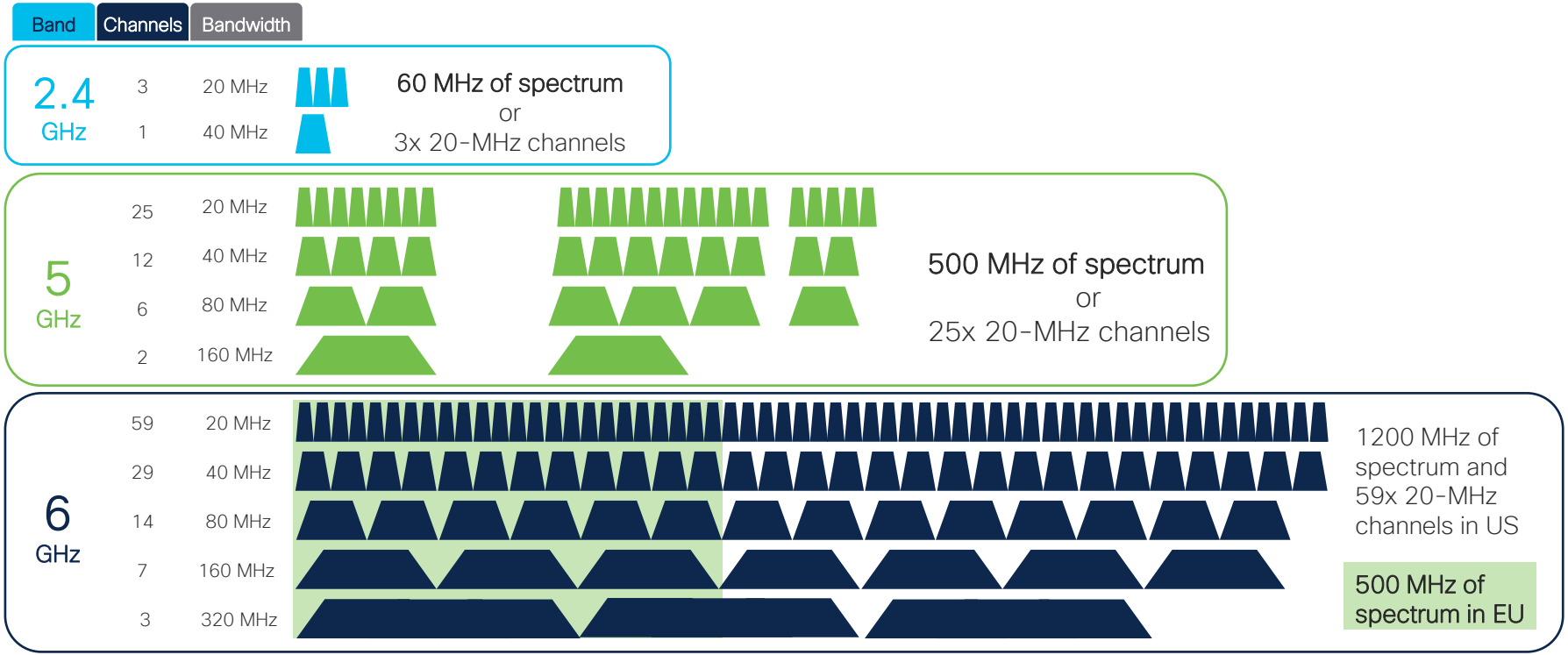
Triggered UL Access Optimization

Wi-Fi 7 Introduces Multi-Link Operations (MLO)



- **Single-Link:** Association and exchange of data in **one band only**.
- **Multi-Link:** Capable Wi-Fi 7 devices can **aggregate multiple bands.**
- Can **associate and simultaneously exchange traffic** on multiple links
- Wi-Fi 7 specifies several use cases for multi-link operation. Supported use case depend on AP and client capabilities

6 GHz Spectrum with Wi-Fi 6E & Wi-Fi 7 only!



6 GHz Spectrum:
Extra Lanes for 6 GHz capable devices!

Congested 2.4 & 5 GHz Spectrum

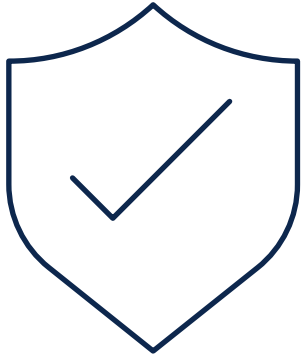
- Limited re-usable channels
- Channels congestion
- Interference

6 GHz Spectrum

- **Supported Wi-Fi 6E and Wi-Fi 7 clients only**
- Wider Channels
- Clean RF

This results in faster speeds, lower latency, and better overall experience

Get secure today: Start using WPA3 Encryption



Educate yourself on the availability and ease of enabling it

Mandatory for 6 GHz & all bands for MLO (Wi-Fi 7)

Use transition mode if you must

Cisco Wireless Wi-Fi 7

Global Use Access Point & Unified Hardware for efficient, smart, scalable operations

RF Excellence & Complete connectivity: BLE, IoT, location, ...

Sustainably built and power-savvy

A huge step forward in sustainability

- Best principles for circular design
- Zero-plastic packaging
- Configurable mounting bracket (Bracket-1, Bracket-2, NONE)
- Multi-Pack option available
- Clear visibility into energy use and footprint

One Cisco Wireless Access Point

Global Use AP, Unified Product, Single SKU

Cisco 9800 Controller &
Cisco Catalyst Center

Meraki **Management Mode**
MR Dashboard Stack

Join WLC 9800 or Meraki stack on Day 0

Management Mode Change from Day 1 to N

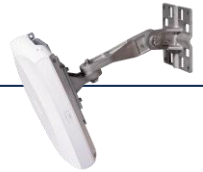
Cisco Wi-Fi 7 Access Point Portfolio

?

CW917xx

CW9176I

12 Spatial Stream
Omnidirectional
10Gbps, GPS, UWB



CW9176D1

12 Spatial Stream
Integrated Directional
10Gbps, GPS, UWB

CW9178

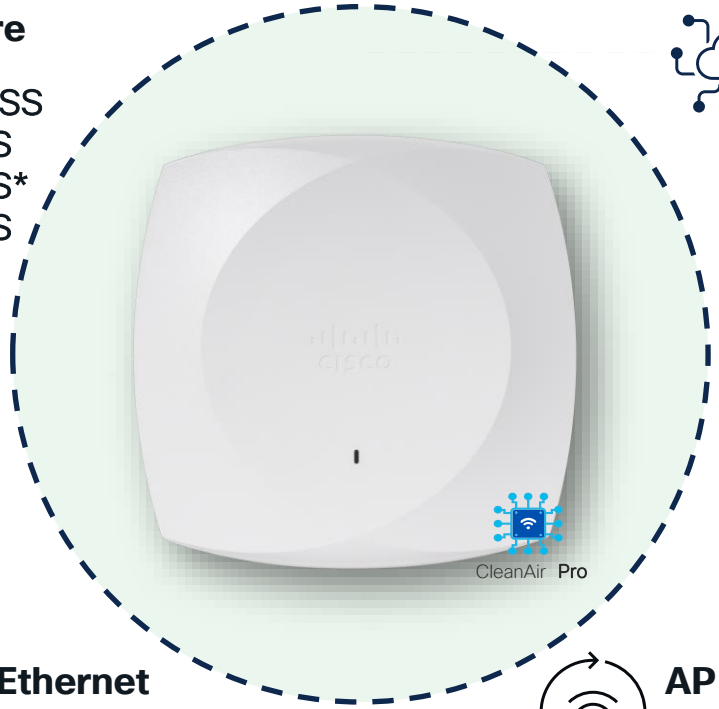
16 Spatial Stream
Omnidirectional
2x 10Gbps, GPS, UWB

Cisco Wireless CW9178 Access Point

Hexa-Radio Architecture

1. 2.4 GHz Serving Radio 4x4:4SS
2. 5 GHz Serving Radio 4x4:4SS
3. 5 GHz Serving Radio 4x4:4SS*
4. 6 GHz Serving Radio 4x4:4SS
5. Tri-band scanning Radio
6. 2.4 GHz IoT Radio

** 5GHz – Single or Dual Radio*



IoT Capabilities
- 2.4 GHz IoT/BLE, UWB
- Application Hosting Technology

Built-in UWB & GPS/GNSS

Omni-Directional Antenna

Built-in USB Port
9W of output power

10 Gig Dual Ethernet
PoE & Link Redundancy

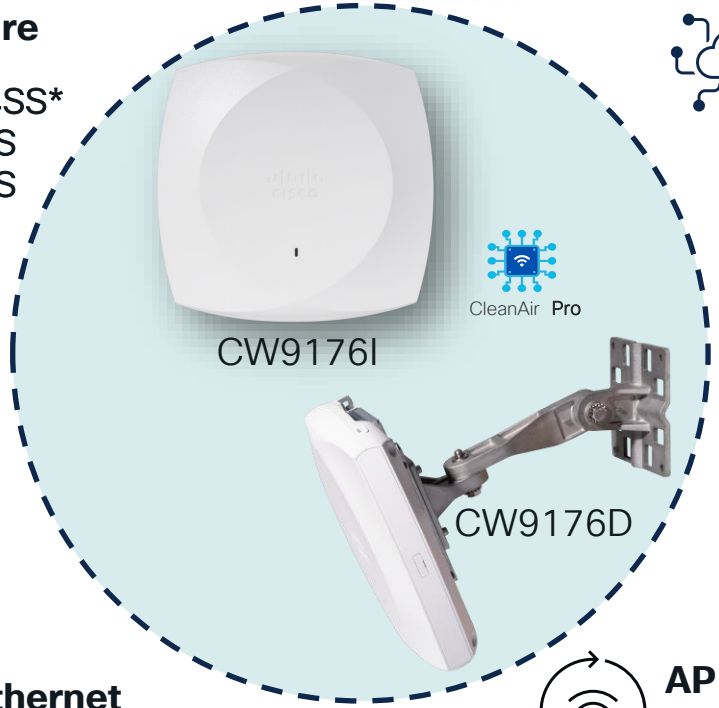
AP Modes (Global Use AP)
Meraki Dashboard, C9800 local &
FlexConnect Site Survey, Monitor/Sniffer

Cisco Wireless CW9176I & D Access Point

Penta-Radio Architecture

1. 2.4 GHz Serving Radio 4x4:4SS*
2. 5 GHz Serving Radio 4x4:4SS
3. 6 GHz Serving Radio 4x4:4SS
4. Tri-band scanning Radio
5. 2.4 GHz IoT Radio

**XOR Radio – 2.4/5GHz*



Omni

Directional

10 Gig Ethernet

IoT Capabilities
- 2.4 GHz IoT/BLE, UWB
- Application Hosting Technology

Built-in UWB & GPS/GNSS

Built-in USB Port
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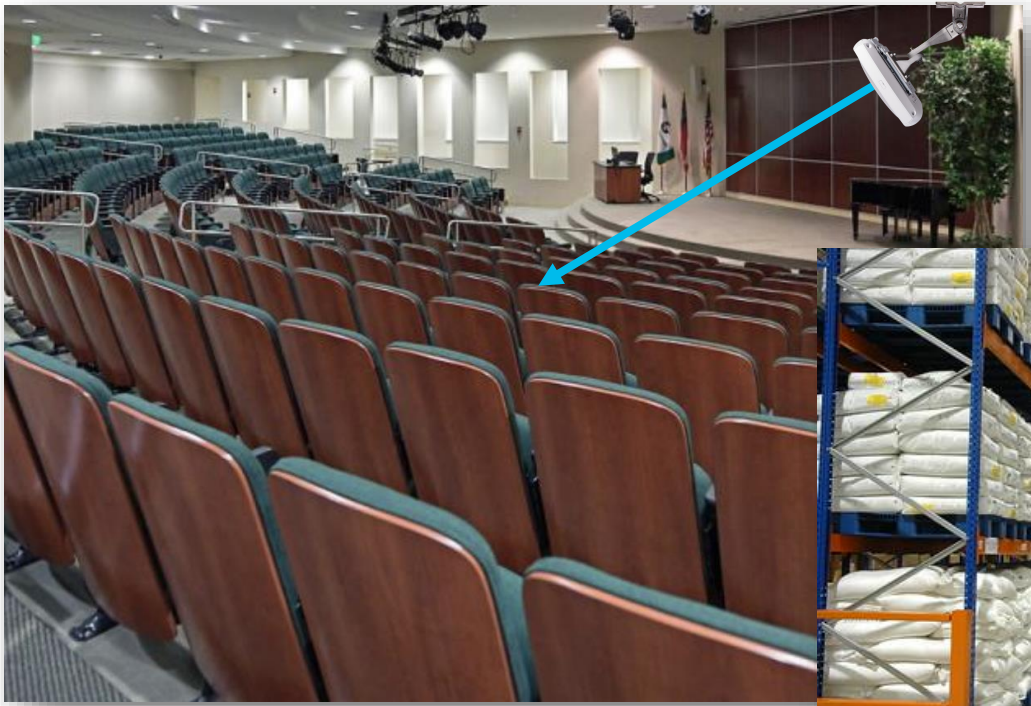
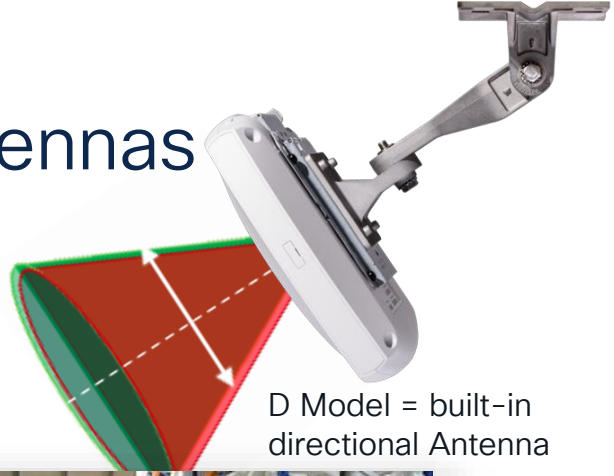
AP Modes (Global Use AP)
Meraki Dashboard, C9800 local &
FlexConnect Site Survey, Monitor/Sniffer

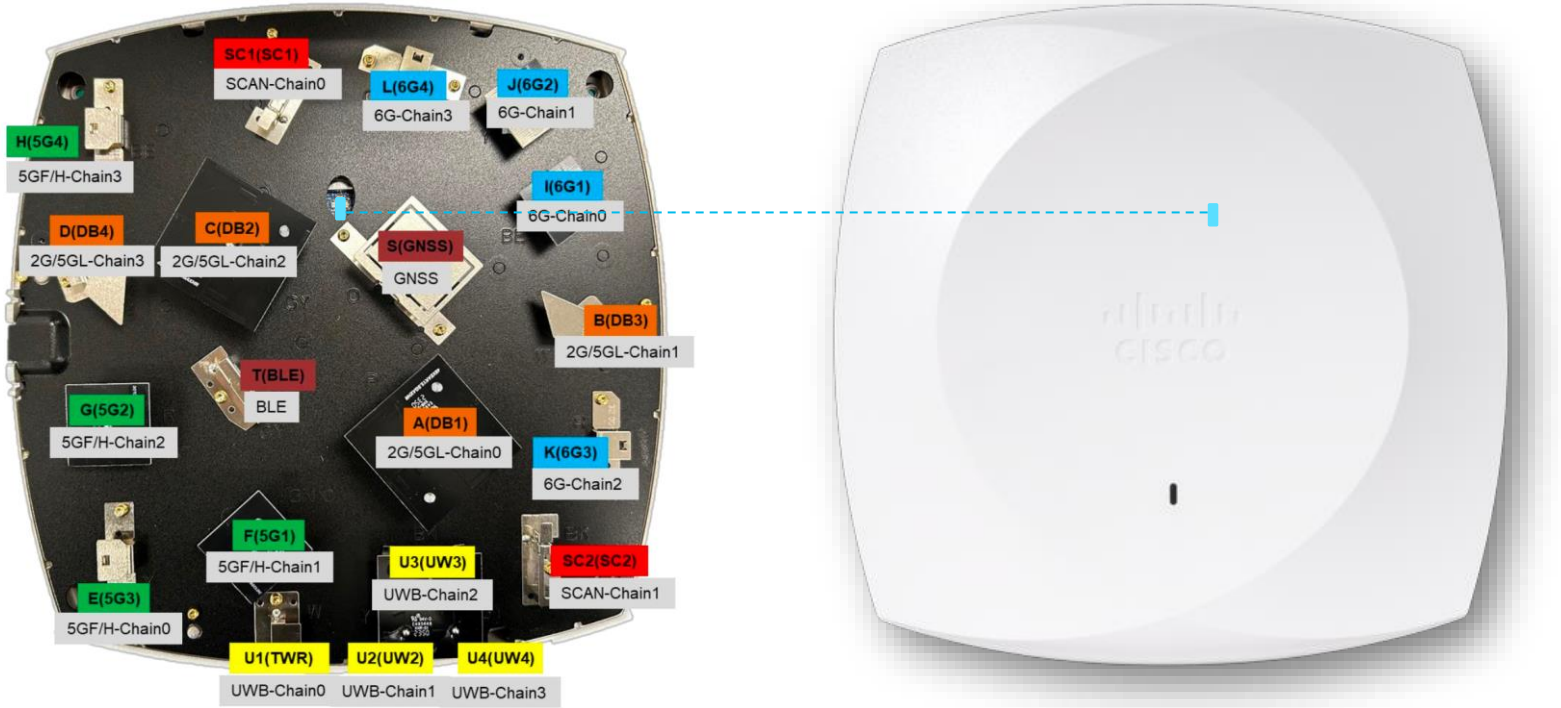
Use cases: Built-in directional Antennas



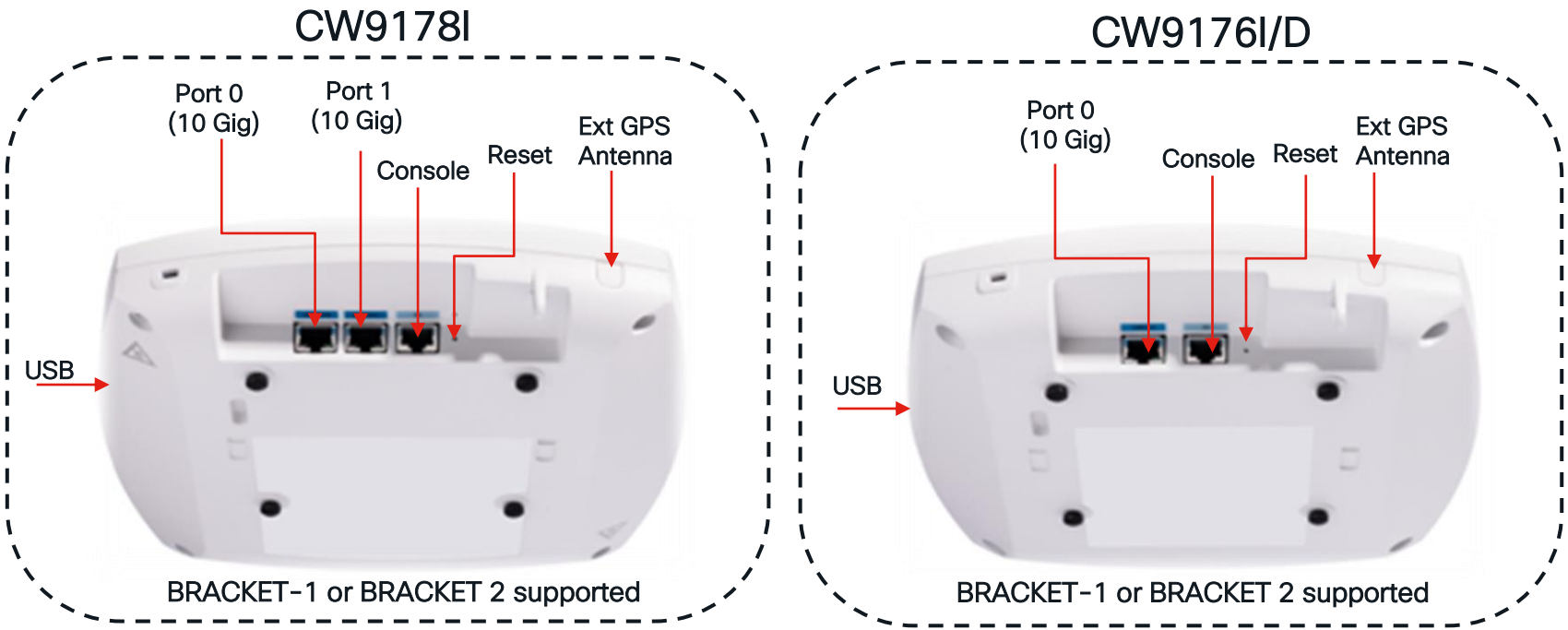


D Model = built-in directional Antenna

Cisco Wireless CW9176I – Antenna Placement



Cisco Wireless CW9178I/CW9176I/D Ports



External GPS/GNSS Antenna

- In case built-in Antenna has poor signal: Use optional external extension GPS/GNSS Antenna.
- Part #:
  - (Cable): CW-ANT-GPS1-M-00
  - (GPS Module): CW-ACC-GPS1

- Use Cases: Obtain Geo-location information for Global Use AP, AFC, AP Auto Locate

*for APs without built-in GPS

Two More ...

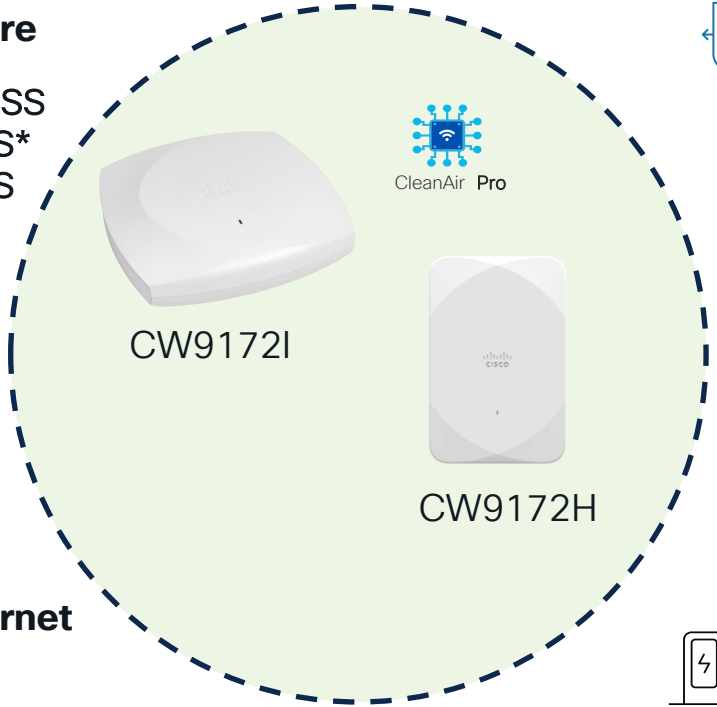
CW9172I & CW9172H
Launched @ CL EMEA'25

Cisco Wireless CW9172I & CW9172H

Penta-Radio Architecture

1. 2.4 GHz Serving Radio 2x2:2SS
2. 5 GHz Serving Radio 2x2:2SS*
3. 6 GHz Serving Radio 2x2:2SS
4. Tri-band scanning Radio
5. 2.4 GHz IoT Radio (BLE)

**XOR Radio – 4x4:4SS on 5GHz, 6GHz disabled*



Omni

2.5 Gig Ethernet

AP Modes
Global Use AP

CW9172H: Wall Plate AP
- 3x 1Gbps LAN port (1x POE out)
- 1x Passthrough port

CW9172I: Built-in USB Port
4.5W of output power

CW9172I: DC Power Jack
(in addition to PoE)

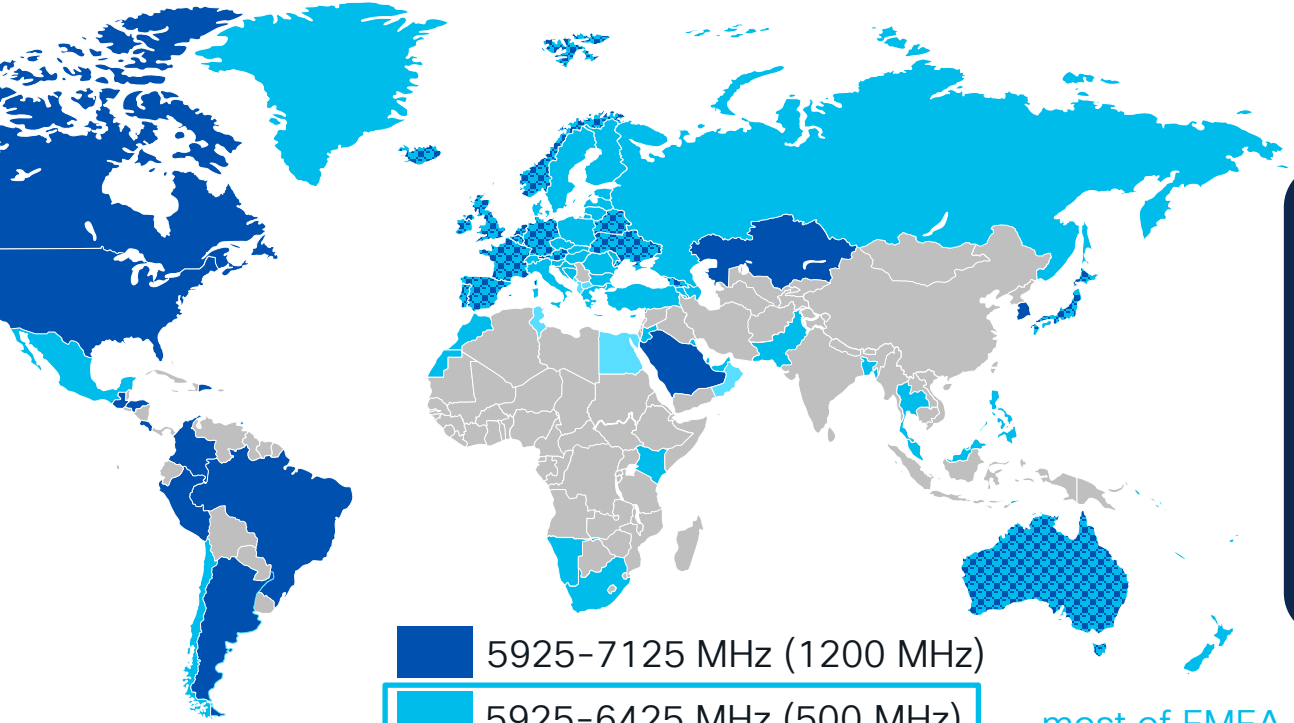
Wi Fi CERTIFIED

Visit Wi-Fi 7 @ Cisco Live Showcase

World of Solutions, Hall 1

All Wi-Fi 7 Access Points for display!

6 GHz Availability & Outdoor in EMEA



5925-7125 MHz (1200 MHz)

5925-6425 MHz (500 MHz) ... most of EMEA

Considering expansion to 1200 MHz

6GHz specific:

Not yet permitted by regulatory bodies in EMEA*:

- **External Antennas**
- **Outdoor** usage

*CEPT/ECC: https://docdb.cept.org/download/1448
https://www.wi-fi.org/regulations-enabling-6-ghz-wi-fi

Cisco CleanAir™ Pro

Detect and identify non-Wi-Fi Interferers

Cisco CleanAir™

RF-ASIC - SaGE Based Excellence

- Purpose built for 2.4 and 5 GHz
- Designed for many common consumer devices – in 2005

Cisco CleanAir™ Pro

Follows Wi-Fi's evolution to 6 GHz

- Full 2.4, 5 and 6 GHz Band support
- AI/ML driven tri-band scanning Radio
- ML Based Interference Classification – On the AP

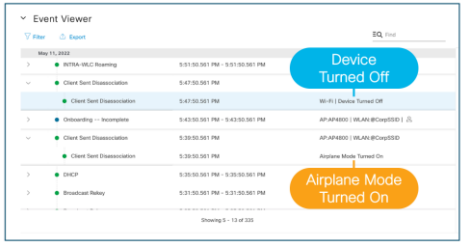
20 years of Cisco RF Excellence, continuing to evolve and innovate

Cisco Device Ecosystem Partners

Device Analytics – only available to Cisco Wireless Networks

iOS Analytics, Fastlane and Fastlane+

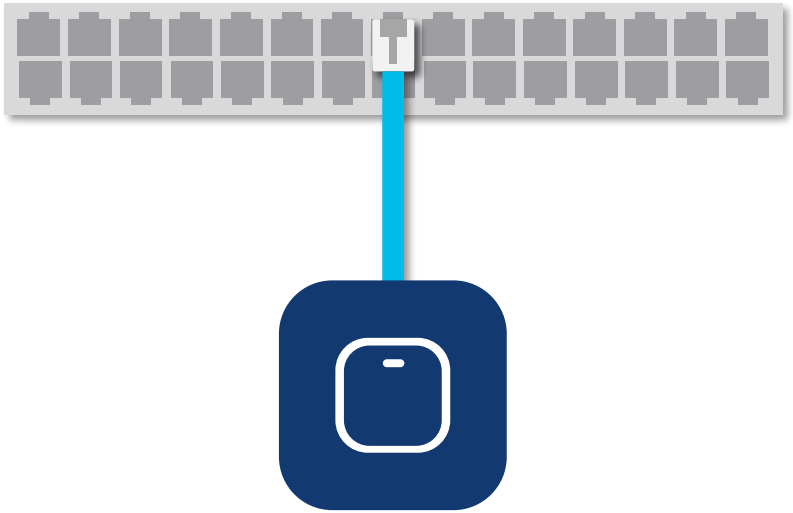
SAMSUNG Analytics



intel Connectivity Analytics

- Issue reporting, roam and disassociate reasons
- Neighboring APs, BSSID, RSSI
- Enhanced device classification

AP Power Consumption



Power Allocated	Power Consumed
48.3 W	16.5 W

PoE Power Negotiation happens at boot time through CDP/LLDP

Power allocation is what you need to consider for power budget

Actual Power consumption is dependent on the AP operation

Recap: Power Over Ethernet Standards

Spec	Known as	Class	Min PSE Output Power	Min PD Input Power
Type 1 IEEE 802.3af	PoE	Class 1	4 W	3.84 W
		Class 2	7 W	6.49 W
		Class 3	15.4 W	12.95 W
Type 2 IEEE 802.3at	PoE +	Class 4	30 W	25.5 W
Type 3 IEEE 802.3bt*	PoE++, Cisco UPOE	Class 5	45 W	40 W
		Class 6	60 W	51 W
Type 4 IEEE 802.3bt	Cisco UPOE+	Class 7	75 W	62 W
		Class 8	90 W	71.3 W

Wi-Fi 7 Operates in this PoE range

*IEEE 802.3bt also specifies Class 4 which means 30 Watt, read switch capabilities carefully

Wi-Fi 7 AP Power Requirements (Simplified!*)

All APs will join with 802.3af (all Wi-Fi radios off)

802.3at (30 Watt)
USB disabled[1]

802.3at (30 Watt)
USB disabled, 2.5 Uplink,
2,4 GHz 2x2 only

802.3at (30 Watt)
USB disabled, 2.5 Uplink,
Quad-Radio: All radios 2x2 or
Tri-Radio: 5 GHz in 4x4

802.3bt (60 Watt)
Full Power

* Check following detailed slides per AP!
[1] External USB GPS Module works at 30 Watt

CW9176I/D1 Power over Ethernet Requirements

Power Source	Number of Spatial Streams	2.4 GHz Radio	5 GHz Radio	6 GHz Radio	mGig Link Speed	USB	IoT/GPS/UWB/Scan Radio
802.3af (PoE)	NA	Disabled	Disabled	Disabled	1G	Disabled	Y
802.3at (PoE+)	10	2x2	4x4	4x4	2.5G*	Disabled	Y
802.3bt** (UPOE/PoE++)	12	4x4	4x4	4x4	10G	Y/9W	Y

FULL POWER

Note:

1. *2.5G (instead of 1G) Ethernet speed with “802.3at” starting IOS-XE 17.15.3
2. **For full radio operation – AP needs more than 30W of power with Type 3 IEEE 802.3bt/ Class 6
3. CW-INJ-8, AIR-PWRINJ7, MA-INJ-6 are Cisco’s 802.3bt power injectors

CW9178I Power over Ethernet

PHY = Physical layer
PoE = Power over Ethernet
UPoE = Universal Power over Ethernet
LB = Lower Band (UNII-1 & 2)
FB = Full Band
HB = Higher Band (UNII-2C &3)

Power source	Number of spatial streams	2.4-GHz radio (slot 0)	Primary 5-GHz radio (slot 1)	Secondary 5-GHz radio (slot 2)	6-GHz radio (slot 3)	mGig PHY 0 link speed	mGig PHY 1 link speed	USB	IoT/GPS/UWB Scan Radio
802.3af (PoE)	NA	Disabled	Disabled		Disabled	1G	Disabled	Disabled	Y
802.3at* (PoE+) (Quad Radio)	8**	2x2	2x2 (LB)	2x2(HB)	2x2	2.5G	2.5G	Disabled	Y
802.3at* (PoE+) (Tri Radio)	8**	2x2	4x4(FB)	Disabled	2x2	2.5G	2.5G	Disabled	Y
802.3bt (PoE++/UPOE)	16	4x4	4x4(LB)	4x4(HB)	4x4	10G	10G	Yes/9W	Y

FULL POWER

Note:

1. *For full radio operation – AP needs more than 30W of power with Type 3 IEEE 802.3bt/ Class 6
2. CW9178I can operate as a Tri-Radio with 5 GHz radio operating in 4x4 Full Band (or) operate as Quad-Radio with 5 GHz in Slot 1 as 4x4 Lower Band (UNII-1 &2) and Slot 2 as 4x4:4, Higher Band (UNII-2C &3)
3. **- Starting IOS-XE 17.15.3 release, 6 spatial streams support in IOS-XE 17.15.2, with 2x2:2 on 2.4/5/6 GHz radios
4. CW-INJ-8, AIR-PWRINJ7, MA-INJ-6 are Cisco's 802.3bt power injectors

CW9172I Power over Ethernet

Power Source	Number of Spatial Streams	2.4 GHz Radio	5 GHz Radio	6 GHz Radio	mGig Link Speed	USB	IoT & Scan Radio
802.3af (PoE)	1	1x1	Disabled	Disabled	1G	Disabled	N
=< 30W 802.3at (PoE+)	6	2x2	2x2	2x2	2.5G	Disabled	Y
=< 30W 802.3at (PoE+)	6	2x2	4x4	Disabled	2.5G	Disabled	Y
> 30W 802.3bt Class 5 (UPOE) or DC Power	6	2x2	2x2	2x2	2.5G	Y/4.5W	FULL POWER Y
> 30W 802.3bt Class 5 (UPOE) or DC Power	6	2x2	4x4	Disabled	2.5G	Y/4.5W	Y

CW9172H Power over Ethernet

Power Source	Number of Spatial Streams	2.4 GHz Radio	5 GHz Radio	6 GHz Radio	mGig Link Speed	POE Out	IoT & Scan Radio
802.3af (PoE)	1	1x1	Disabled	Disabled	1G	Disabled	N
=< 30W 802.3at (PoE+)	6	2x2	2x2	2x2	2.5G	Disabled	Y
> 30W 802.3bt Class 5 (UPOE)	6	2x2	2x2	2x2	2.5G	Y/15.4W	Y

AP only needs more power is **PoE out** is a requirement!

Wi-Fi 7 Software Dependencies

CW9176I/D1

CW9178I

CW9172I

CW9172H

CW9176I/D & CW 9178I
- Software: IOS XE 17.15.2 or later
- Meraki: 31.1.5 or greater
- Catalyst Center: 2.3.7.x
- Prime Infrastructure: no support

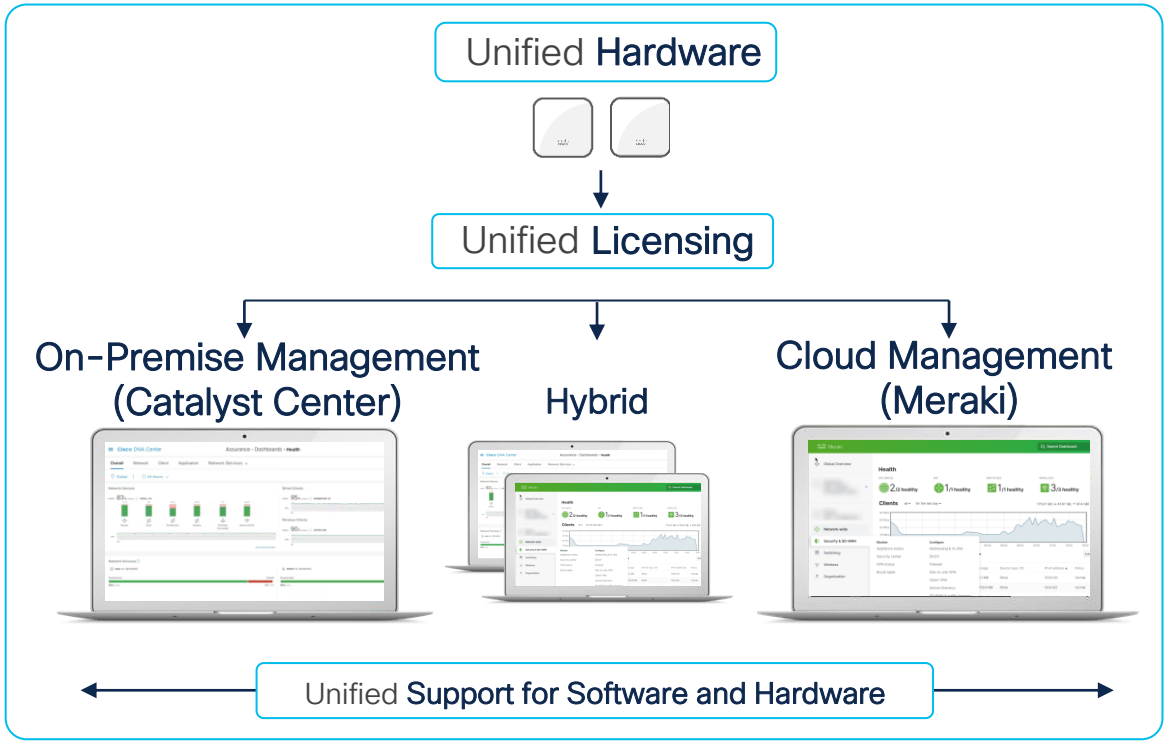
CW9172I:
- Software: IOS XE 17.15.2b or later
- Meraki: 31.1.5 or greater
- Catalyst Center: Summer 2025
- Prime Infrastructure: no support

CW9172H:
- Software: IOS XE 17.17.x or later
- Meraki: 31.1.5 or greater
- Catalyst Center: Summer 2025
- Prime Infrastructure: no support

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

*Bracket-1 or Brac

Wi-Fi 7 Unified Hardware, License & Global Use AP



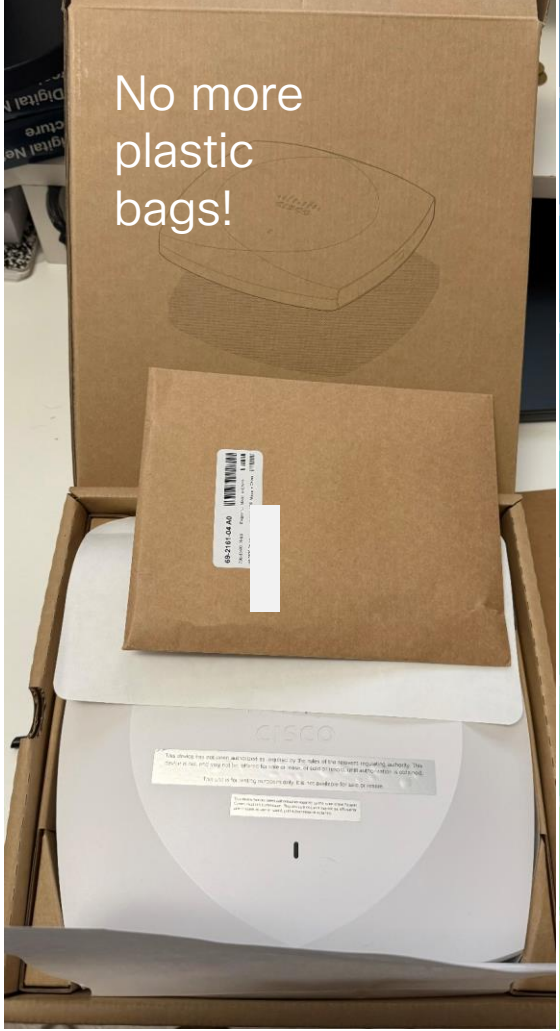
- Cisco Access Point! → no more separate Meraki/Catalyst APs
  - only one SKU* per AP model!
- **Global Use** → no more -E, -A, -ROW, etc.
- **One License**: Flexible to use either Platform to operate
- Software Upgrades and TAC support included

*Stock Keeping Unit

Day Zero: Key questions

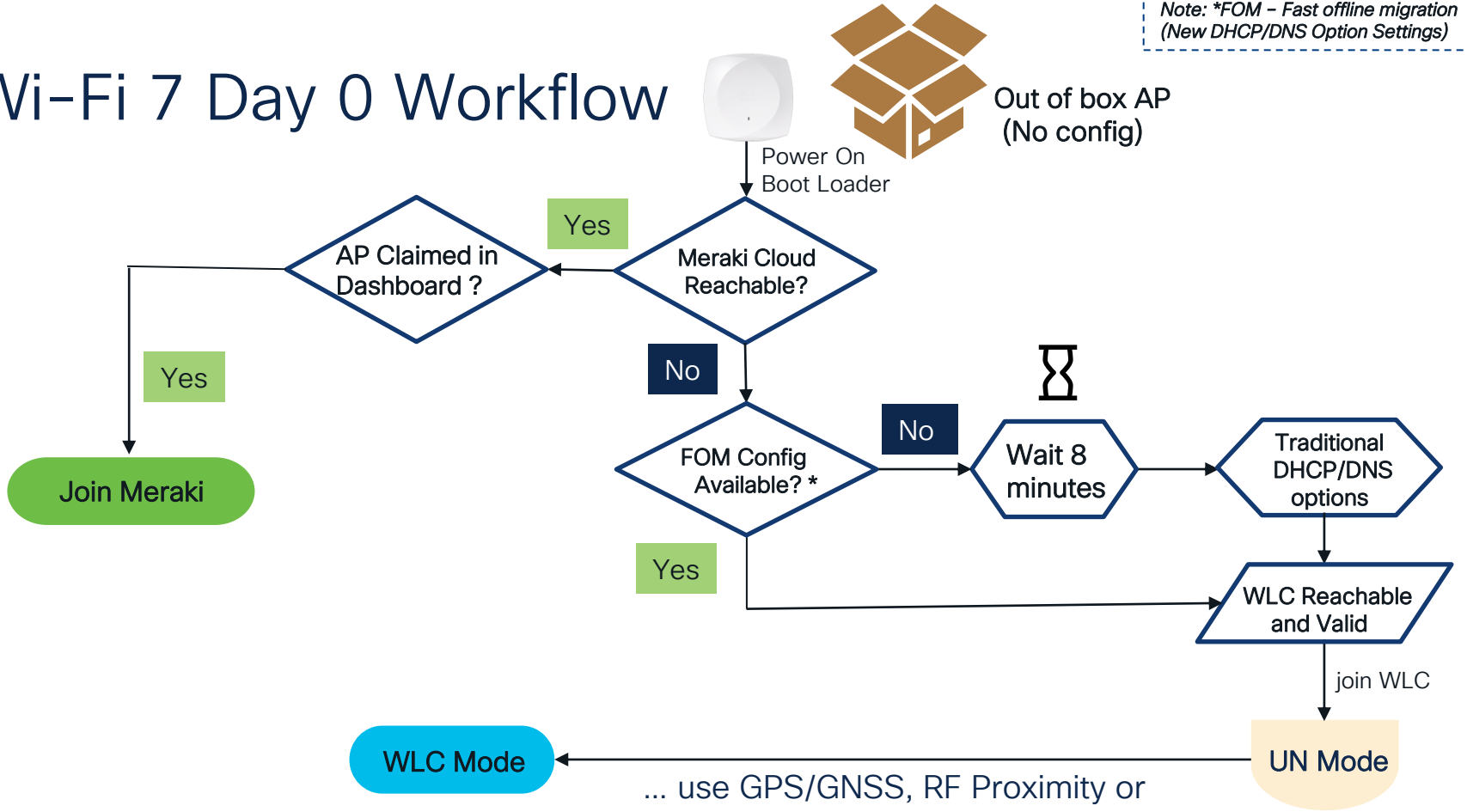
1. How to decide on the mode of operation? Cloud or WLC (Meraki or C9800)?

2. What regulatory domain/country setting?



Wi-Fi 7 Day 0 Workflow

*Note: *FOM – Fast offline migration (New DHCP/DNS Option Settings)*



From “UN Mode” to YOUR Regulatory Domain…

UN Mode means: 2,4 GHz only (== legal anywhere In the world)

1. **Meraki** mode: Geo-IP location and network-wide setting (same behavior as today)

2. **GPS/GNSS** Obtain the geolocation through the integrated GPS/GNSS Antenna.

3. **Proximity based discovery** – Learn from the nearby APs connected to the same WLC through RF NDP messages (2,4GHz!)

4. **Activation File (RAF)** from Meraki Dashboard, that can be installed on WLC. The entire process can be automated via API and scripting.

Simple migration between Cloud and On-Premise

Country Code settings will be kept during migration

Done from C9800 WLC

Done from Meraki Dashboard*

*Wi-Fi 7 APs only

Not to forget: Cisco Wi-Fi 6/6E portfolio

6E

9162

9164

9166

9136

MR57

6

9105I/W

MR28/36/36H

9115

MR44

9120

MR46

9130

MR56

Outdoor

9124

MR78/76/86

Management mode can be changed

Cisco Outdoor Access Points

MR78/76/86

- 802.11AX, MU-MIMO, OFDMA
- MR76/78: 2x2 MR86: 4x4
- Integrated Scanning Radio
- Cloud based RF Optimization
- MR76/78: 1G MR86: 2.5G
  MR76/78: .3af MR86: .3at

C9124

- 3 Models:
  - C9124AXI, (Built-in Antenna)
  - C9124AXD (Built-in directional)
  - C9124AXE (External Antennas)
- 802.11AX, MU-MIMO, OFDMA
- 4x4 + 4x4:4 (2.4 & 5 GHz)
- Cisco RF ASIC (CleanAir)
- 1x 2.5G mGig/SFP/1Gbe PoE-Out
- PoE-In 802.3af/at/bt/UPOE
- DC power input (24 to 56 VDC)

Management mode can be changed

CW9163E

- 802.11AX, MU-MIMO, OFDMA
- 2x2(2.4GHz) + 2x2(5GHz) + 2x2(6GHz)
- **Outdoor 6GHz: usability subject to local country RF regulations**
- Tri-band Scan Radio (CleanAir Pro)
- 1x 2.5G mGig
- Built-in GPS module
- PoE-In 802.3af/at

Entry to Wi-Fi 7: CW9172I Upgrade Path

Future-ready connectivity for Meraki and Cisco Catalyst customers

Dual Radio

Wi-Fi 6

MR44
2x2(2.4)+4x4(5)

C9115
4x4 (2.4+5)

Tri-Radio

Wi-Fi 6E

9162
2x2(2.4+5+6)

9172I

2.4GHz 2x2 + 5GHz 4x4

or

2.4GHz 2x2 + 5GHz 2x2 + 6GHz 2x2

Wi-Fi 7 Wall Plate: Upgrade Path to CW9172H

Future-ready connectivity for Meraki and Cisco Catalyst customers

Wi-Fi 6

MR36H
2x2(2.4+5 GHz)

C9105AXW
2x2(2.4+5 GHz)

9172H

2.4GHz 2x2 + 5GHz 2x2 + 6GHz 2x2

Wi-Fi 7 OS and Client Support

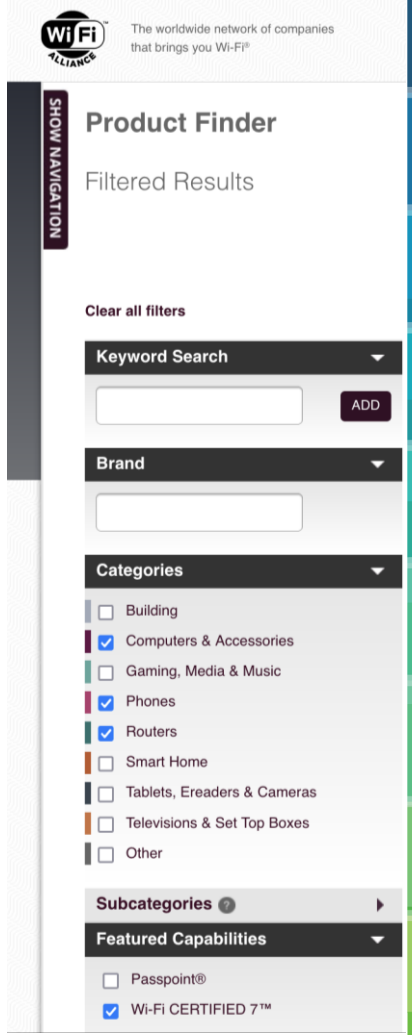
Check Wi-Fi Alliance product finder for the latest Wi-Fi 7 certified products.
https://www.wi-fi.org/

Wi Fi CERTIFIED

Windows 11 Support available in **Windows 11**

iPhone 16, Pro Plus, Pro, and Pro Max

android Support available in **Android 13 or greater**



Agenda

1. Wi-Fi 7 & APs
2. Platform Choices
3. Simplified Operation

4. Location Services
5. Secure!
6. Built in IoT

What Platform? Your Network, Your Choice!

On-prem

“We have a large investment of Catalyst infrastructure”

and/or

“We have complex networking needs (e.g., SD-Access)”

Catalyst Center

Hybrid

"We have refreshed or plan to refresh to the latest Catalyst hardware and looking into Cloud"

and/or

"We want Catalyst core and Meraki edge devices"

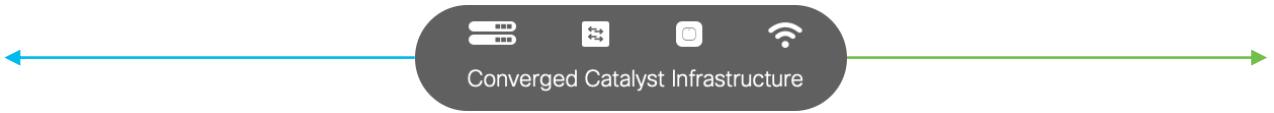
cisco Meraki

Cloud

“We are planning to refresh our entire Catalyst infrastructure and want a SaaS/ cloud-first solution”

Options:
Meraki fullstack
Catalyst migration (9300, CW91xx)

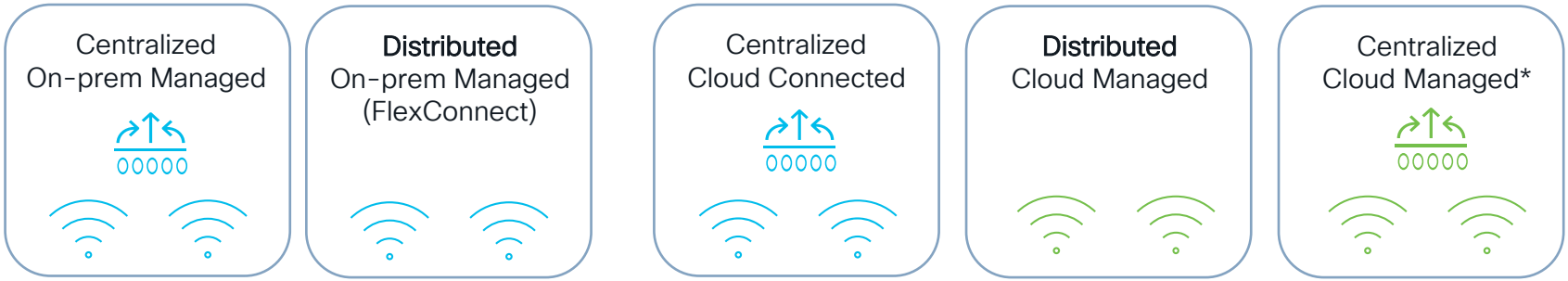
cisco Meraki



Cisco Wireless Deployment Options

Catalyst Center

Meraki



Campus network (**On-prem**)

Branch Offices (**On-prem**)

Campus network (**Hybrid**)

Branch & Small Campus Offices (**Cloud**)

Campus network (**Cloud**)

Catalyst APs (W1/W2)
Catalyst 916x
Catalyst 917x

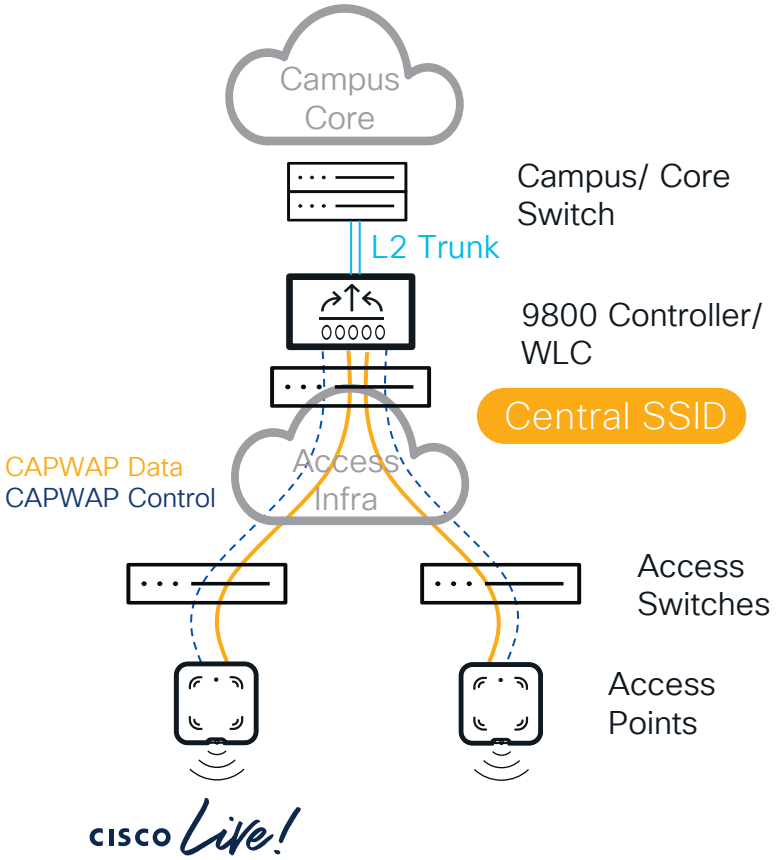
9800 Wireless Controller

Meraki MR
Catalyst 916x
Catalyst 917x

Future Product

* Future Solution

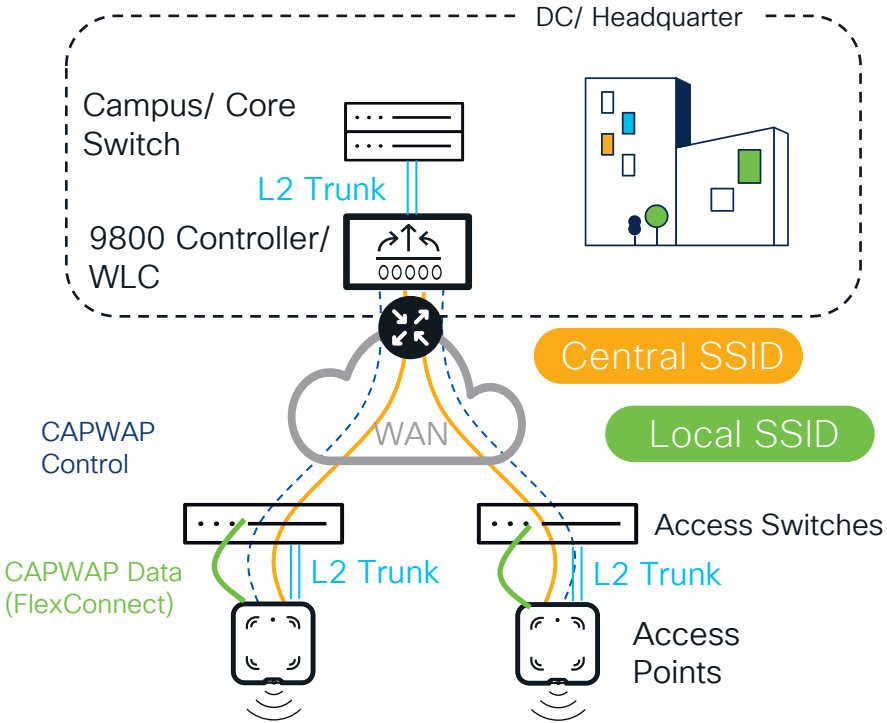
On-Prem: Central Deployment Mode



- Simple IP Addressing and mobility
  - All wireless client traffic is switched at the WLC
  - Client IP addressing & VLAN(s) defined on WLC
  - Client Layer 3 roaming across all APs
- Client traffic bridged at WLC in a L2 trunk
  - Easily apply security & QoS policies for wireless users
- Simplified Overlay Design
  - Traffic is tunnelled (using CAPWAP Protocol) from AP to WLC
  - Latency < 20ms between AP and WLC
  - Can be deployed on top of any wired infrastructure

CAPWAP Control
CAPWAP Data

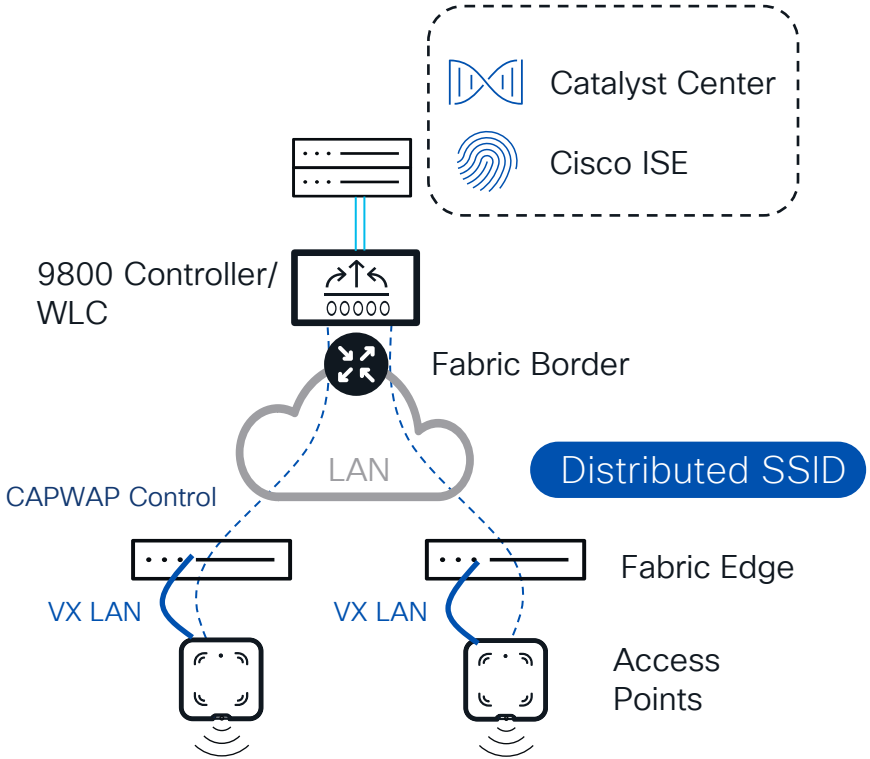
On-Prem: Distributed Deployment (FlexConnect)



- Distributed Enterprise design choice
  - Roaming limited to APs in a FlexConnect domain
- WAN Failure Survivability in Branch Offices
  - FlexConnect AP will go to “Standalone Mode”- no impact on locally switched SSIDs
- Design Parameters
  - Per SSID: Client traffic is distributed at AP in L2 trunk or centralized via CAPWAP
  - 100 APs per FlexConnect domain/branch
  - Latency < 300ms between AP and WLC
  - Can be deployed on top of any wired infrastructure

cisco Live!

On-Prem: Software Defined Access

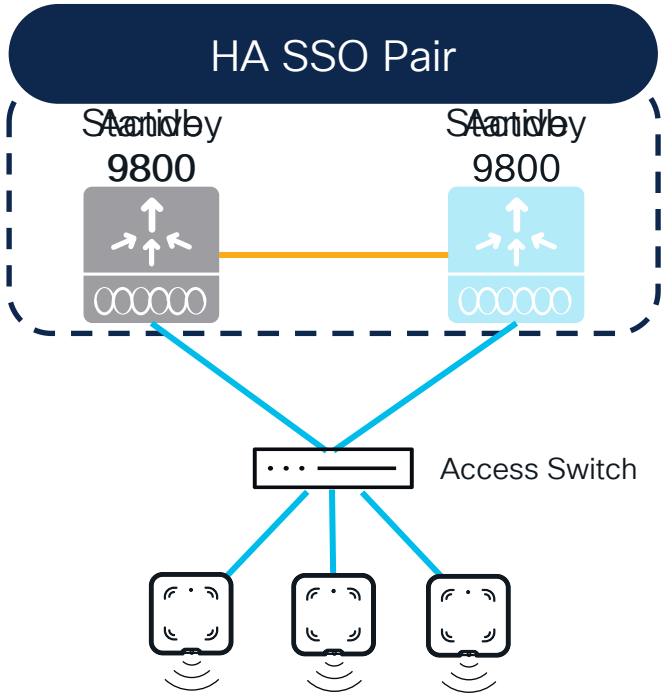


- SD-Access:
  - Wired-Wireless automation for design and deployment
  - Macro-Micro Segmentation for enhanced security (Common policies for Wired-Wireless) using Cisco ISE
- Single touchpoint for deployment & management with Cisco Catalyst Center
- Design
  - Cat9k Switch Infrastructure required
  - Latency < 20ms between AP and WLC

Consider Controller High Availability!

- Redundancy helps in maintaining network uptime by providing a backup controller that can take over in case the primary controller fails.

- “HA SSO” is the best choice:
  - Pair of 9800 appear as a single WLC
  - All configuration synced → stateful switchover
  - Clients and APs do not disconnect



AP failover within sub seconds!

On-Prem Platform: Cisco Catalyst Center

End-to-end secure networking

Defend attack surfaces through advanced AI-enhanced endpoint analytics and SD-Access

Digital experience assurance

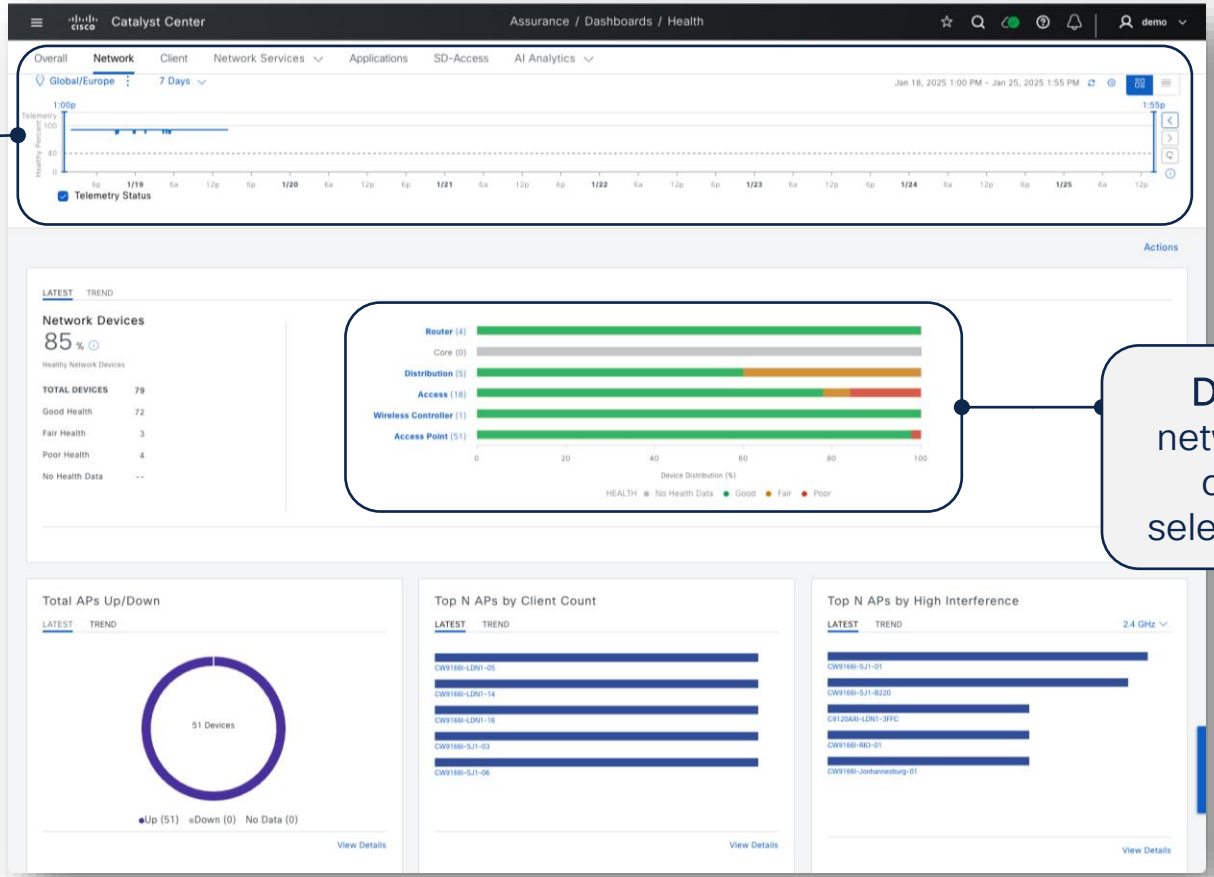
Automating the process to detect, identify, and resolve network issues that could disrupt business outcomes

Simplify AI-native operations

Simplify sophisticated network operationsand scale at the speed of business

Software 2.3.7.x: **Cisco DNA Center** is re-named to **Catalyst Center**. The capability and functionality remains the same.

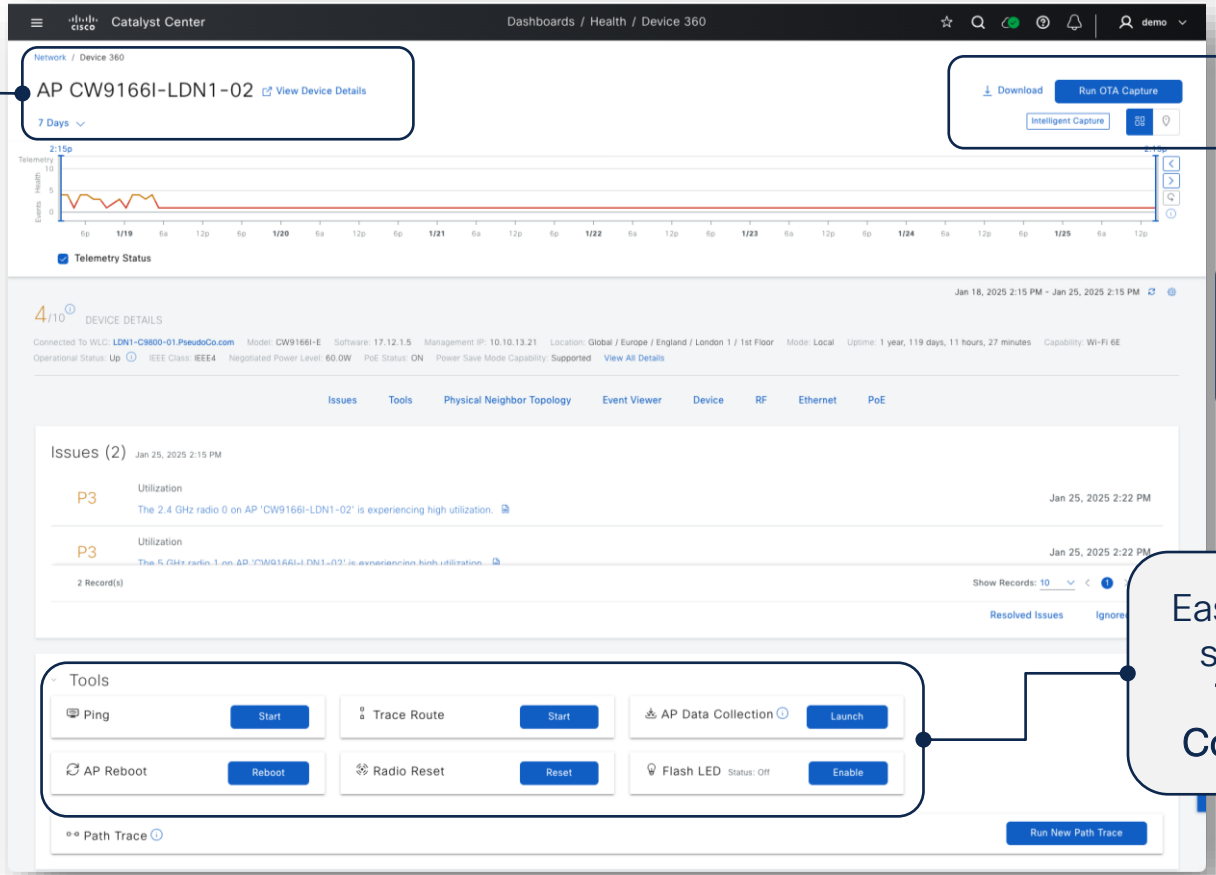
Catalyst Center > Assurance > Health > Network



Network Details for selected Location and time period

Devices in your network and Health condition over selected time period

Catalyst Center > Assurance > Health > Device 360



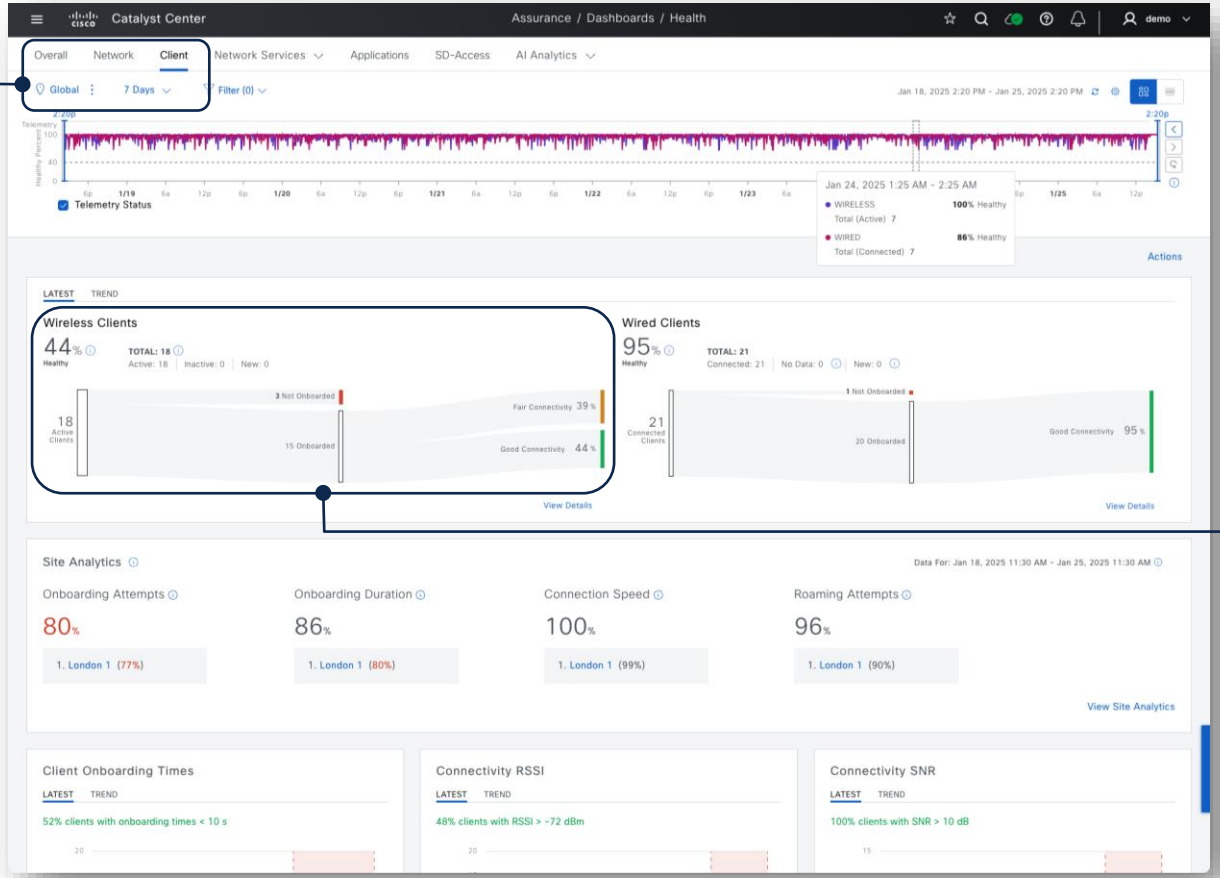
Select any device for “**Device 360**” Details! Example: AP CW9166

Run **OTA Traffic capture** from GUI!

Easy tool access such as **Ping**, **Traceroute**, **Collect Data**, …

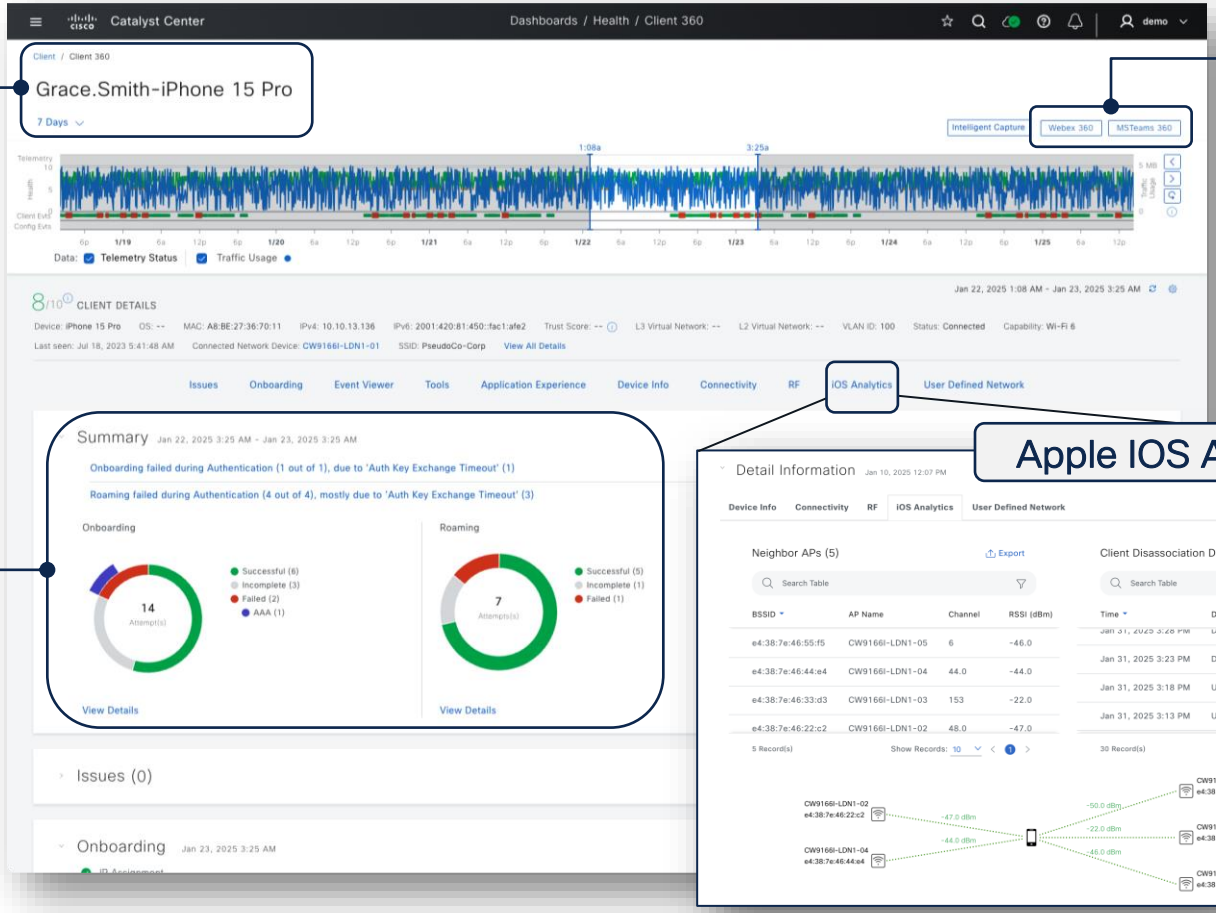
Catalyst Center > Assurance > Health > Client

Client Details for selected Location and time period



Wireless Client Connectivity Details

Catalyst Center > Assurance > Health > Client 360



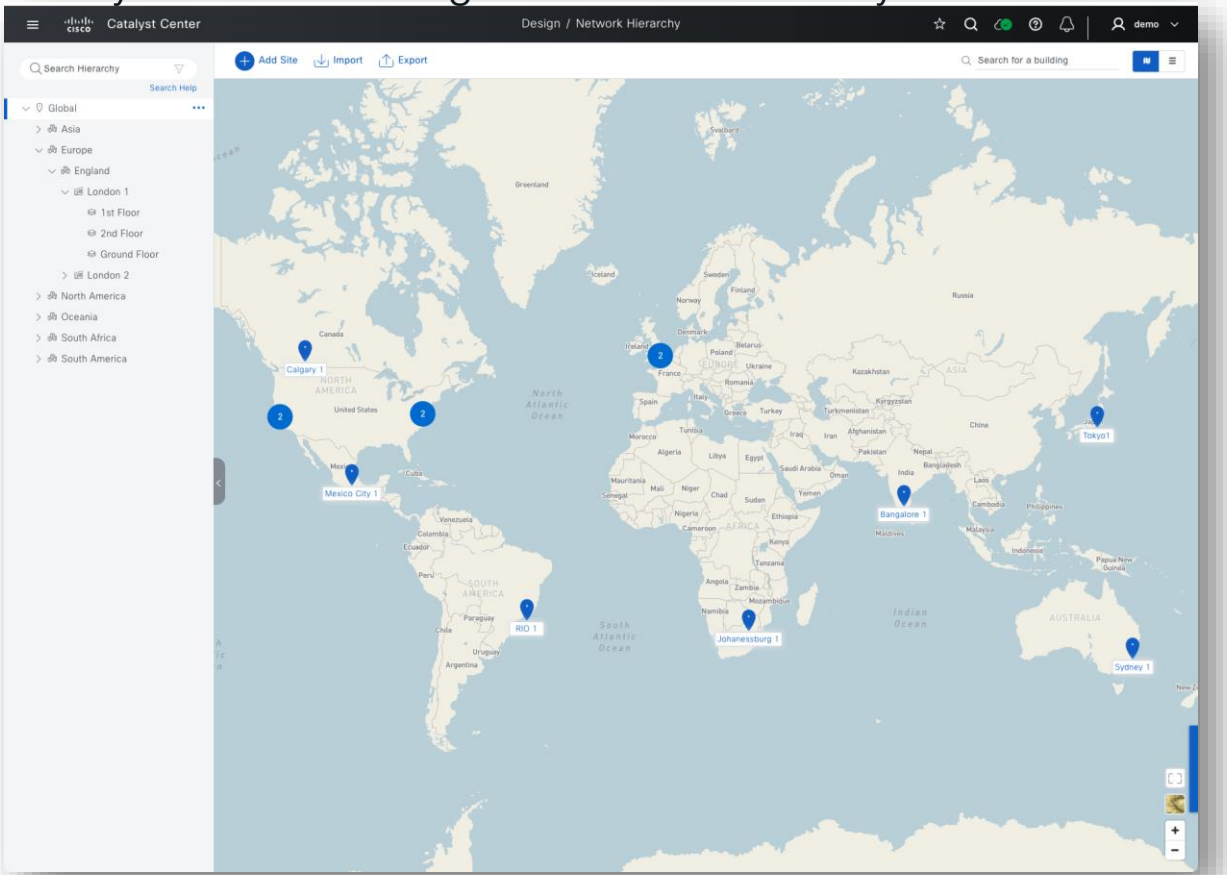
Client 360 Details for a specific Client Device over selected 7 day period

Onboarding & Roaming Details

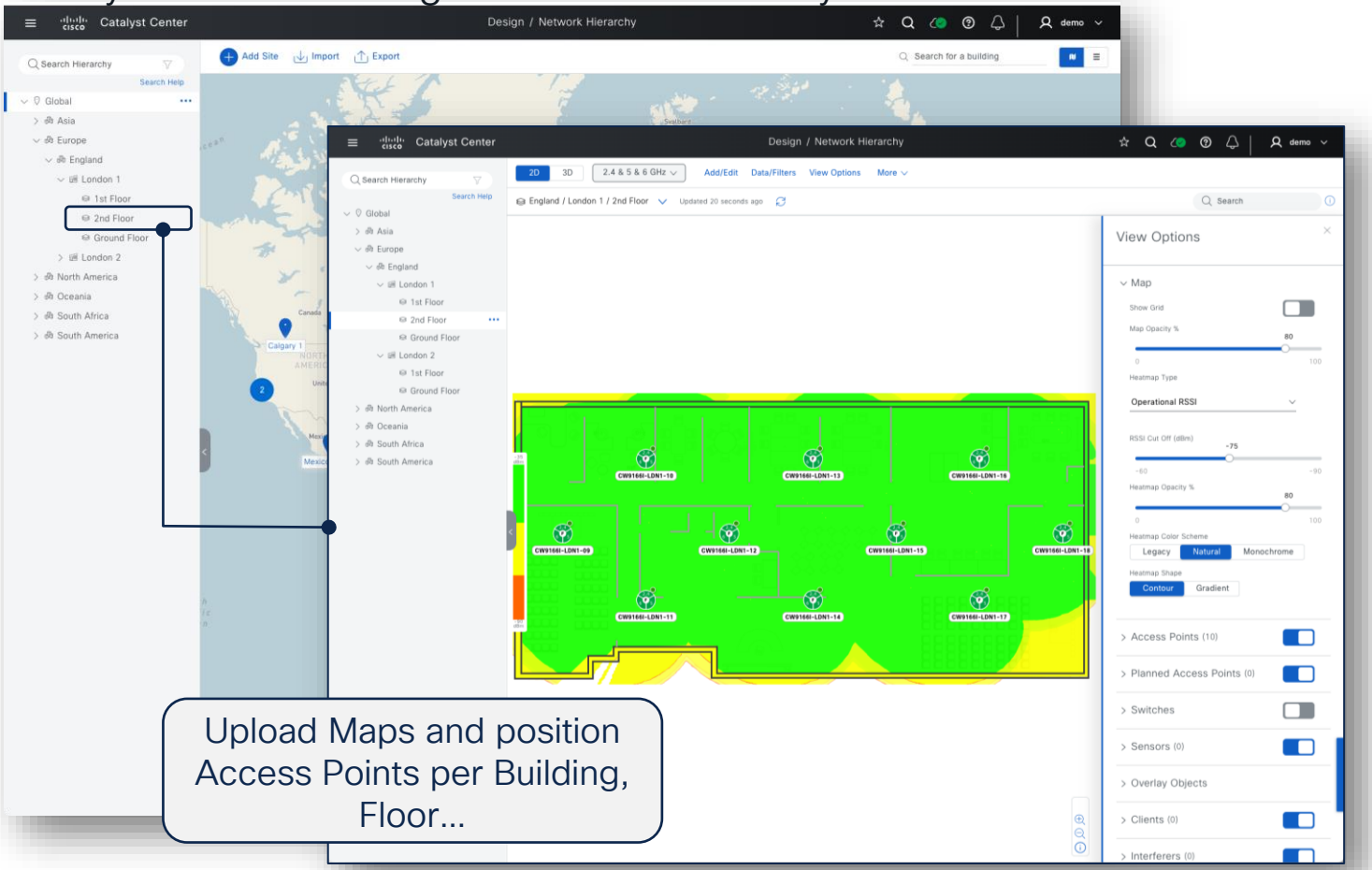
WebEx and **MSTeams** Meeting Quality Analytics

Apple IOS Analytics

Catalyst Center > Design > Network Hierachy

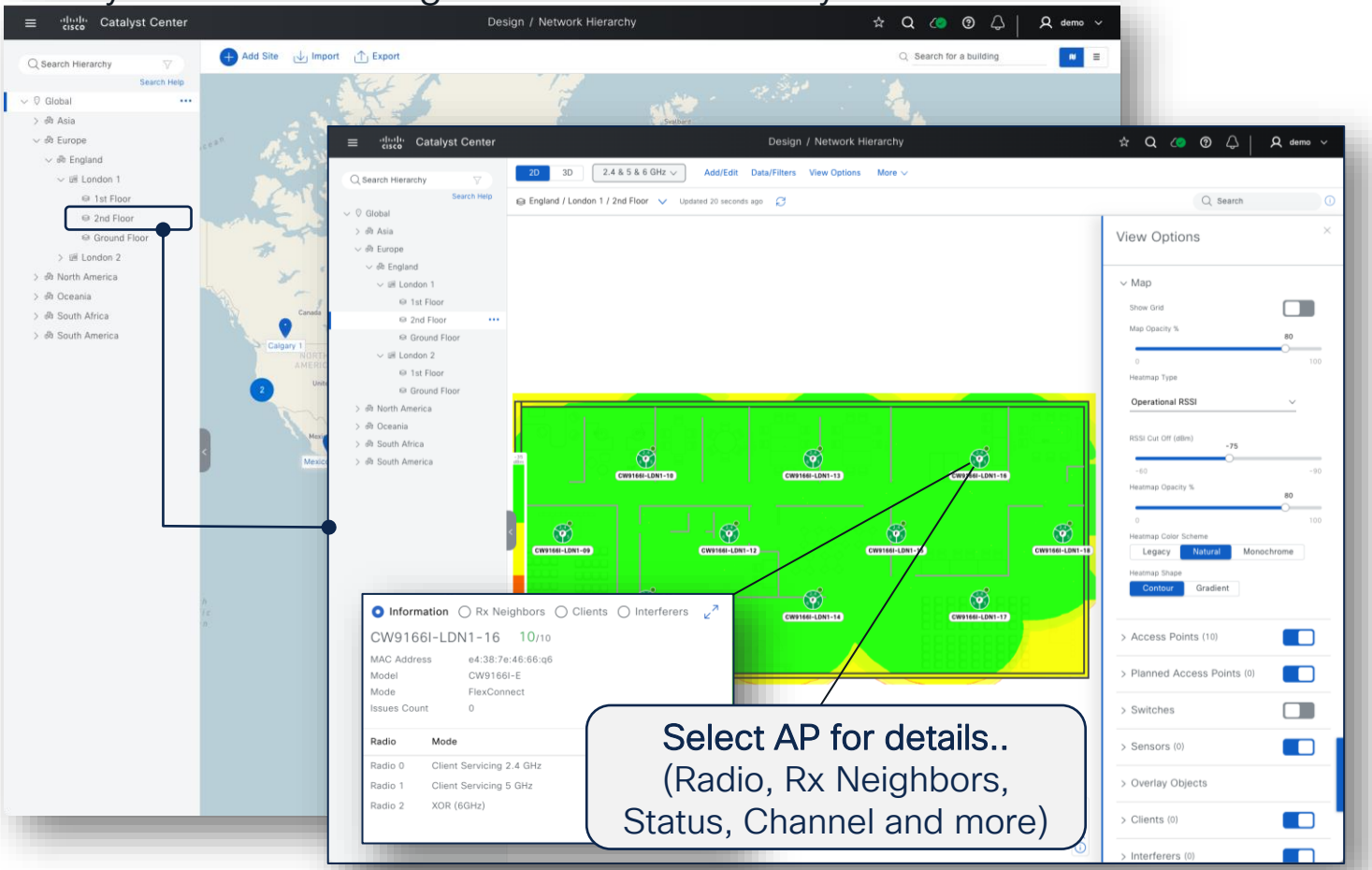


Catalyst Center > Design > Network Hierachy



Upload Maps and position Access Points per Building, Floor...

Catalyst Center > Design > Network Hierachy



Cisco Catalyst Center operational evolution

Scaling to meet your enterprise needs

Catalyst Center

Cisco UCS® Server
Software pre-installed

Catalyst Center physical appliance

up to 25,000 Access Points

x86-based server
Software supplied by Cisco $0
+
ESXi license

ESXi virtual appliance

up to 4,000 Access Points

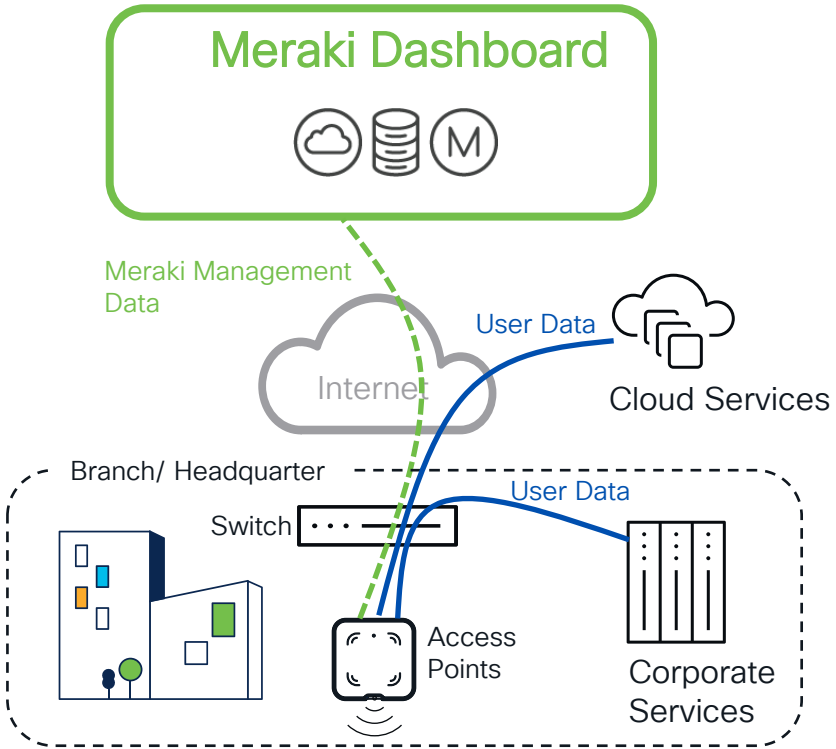
Software supplied by Cisco $0
+
AWS subscription

AWS virtual appliance

up to 4,000 Access Points

Management Data
User Data

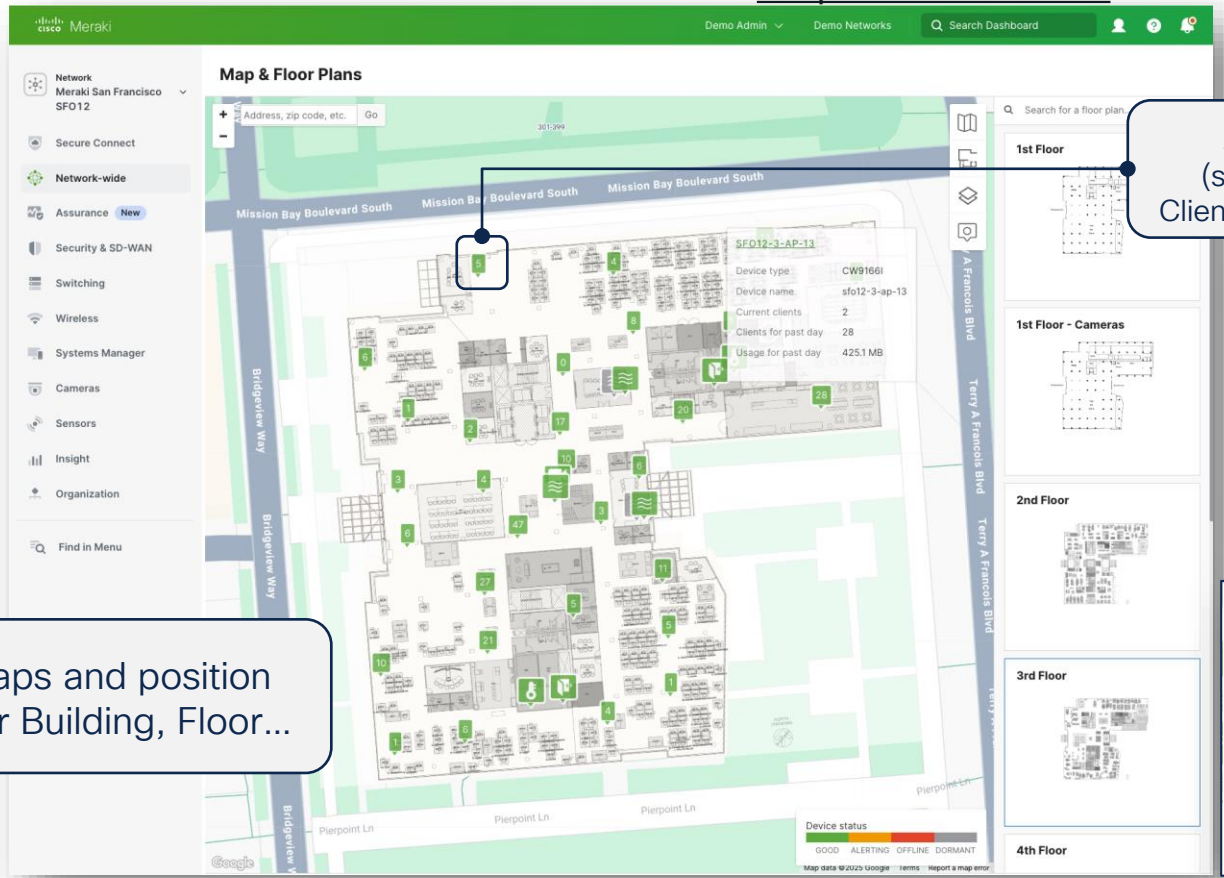
Meraki Cloud: Distributed Deployment



- **Simplified Operations:**
  - Intuitive browser-based UI (Dashboard)
  - Self-configuring PnP deployments
  - Seamless firmware updates
- **Data Transfer & Privacy (EU GDPR*):**
  - Management data transferred using encrypted TLS tunnel (AES-256, port 443)
  - User data (network traffic, web browsing, internal applications, etc.) flows directly to the destination - LAN or WAN.
  - 1 kbps per device

* More info: https://meraki.cisco.com/trust/

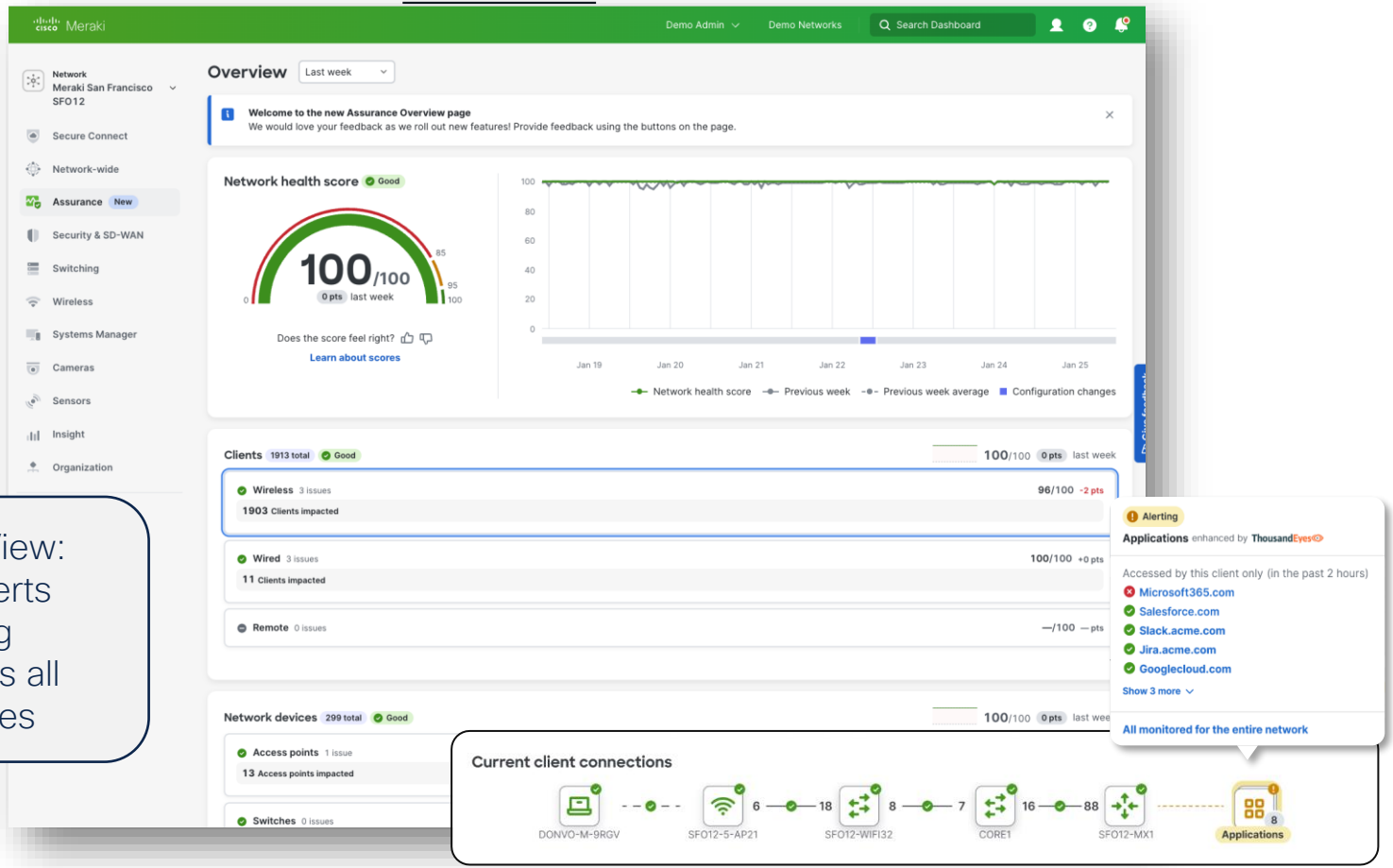
Meraki Dashboard > Network-wide > Map & Floor Plans



Access Point
(showing number of Clients from previous day)

Upload Maps and position Devices per Building, Floor…

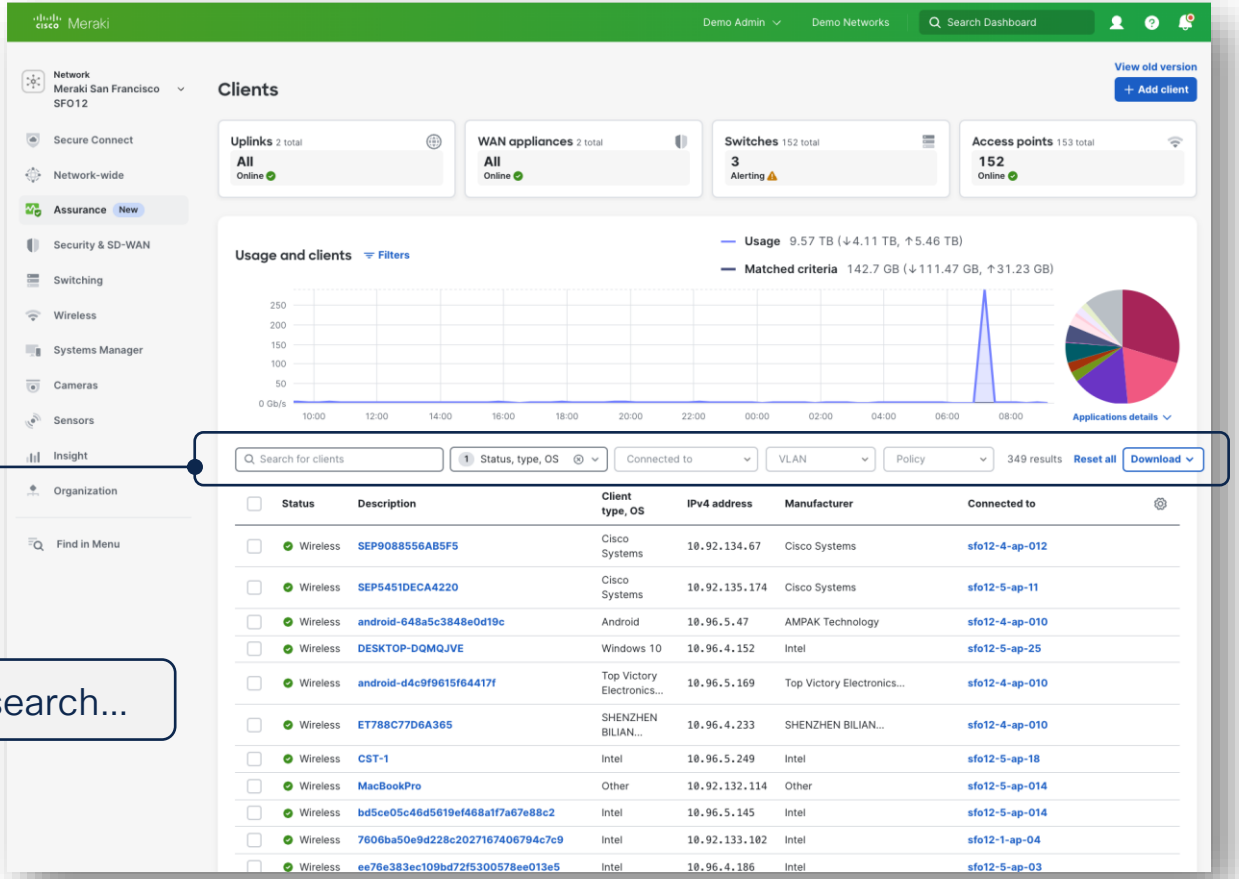
Meraki Dashboard > Assurance



New Assurance View:

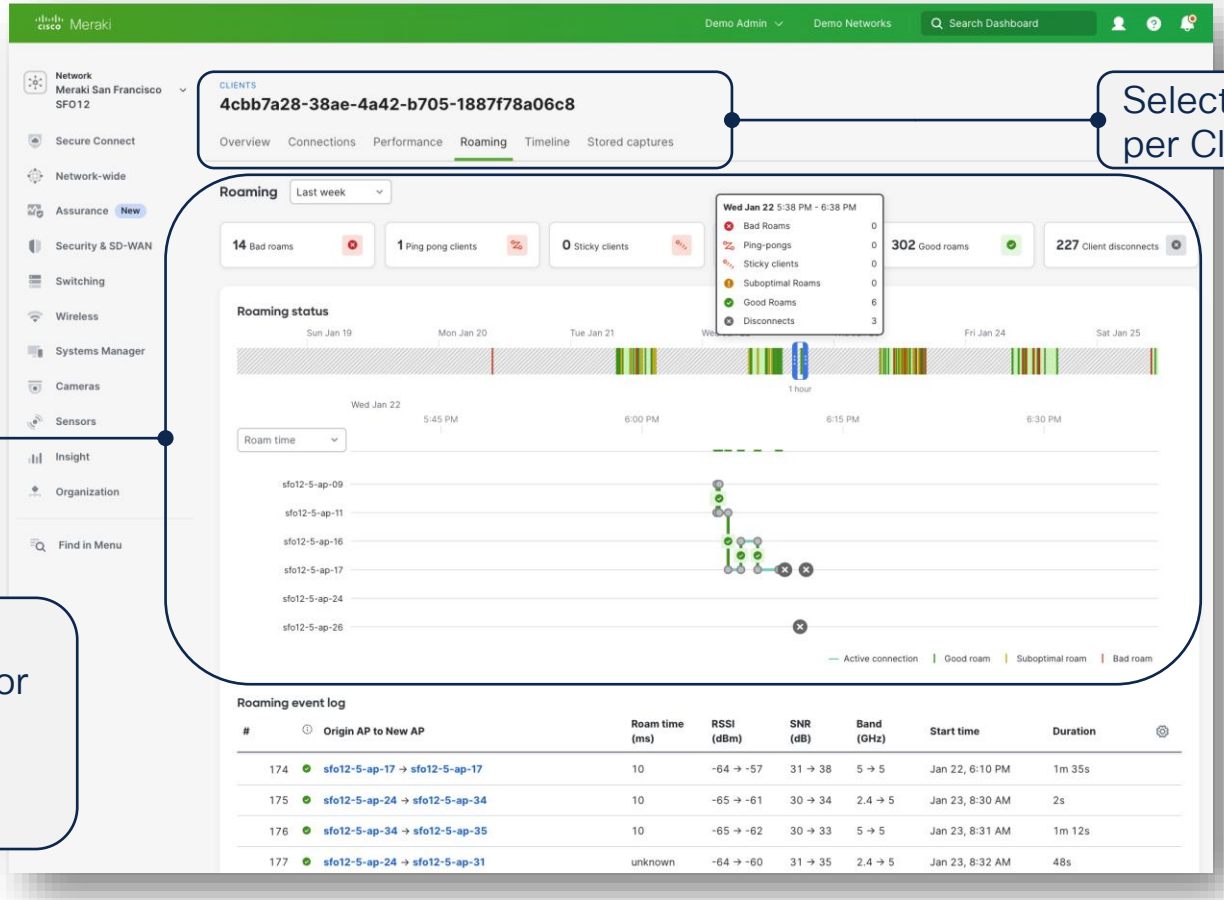
- Centralized alerts and monitoring
- Visibility across all network devices

Meraki Dashboard > Assurance > Clients



Flexible client detail search...

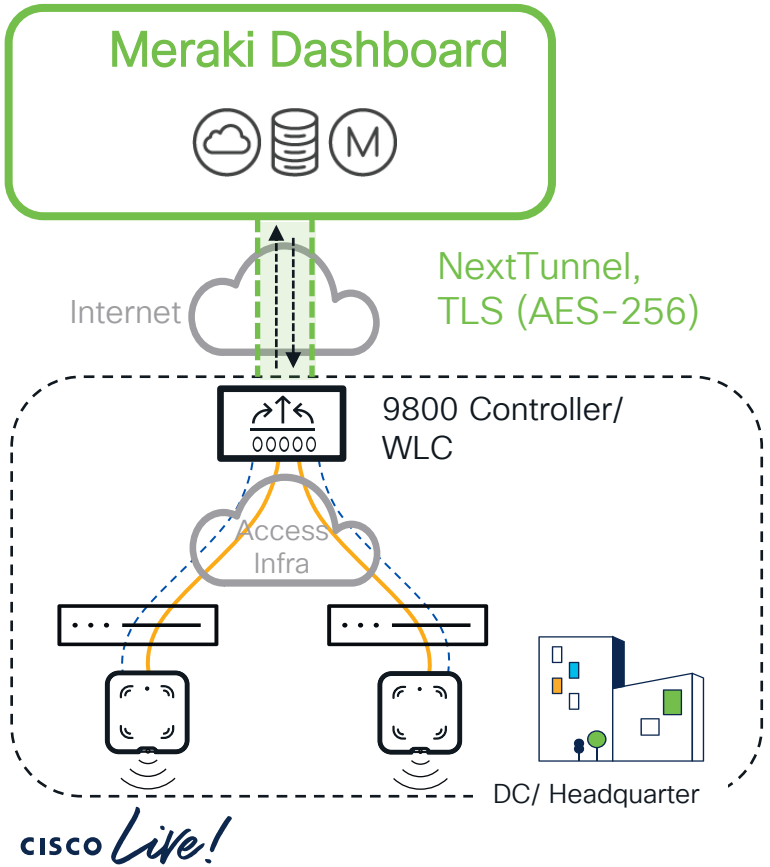
Meraki Dashboard > Assurance > Clients > *“selected Client”*



Selection of Details per Client

Obtain **roaming** behavior details for a specific client during selected hour…

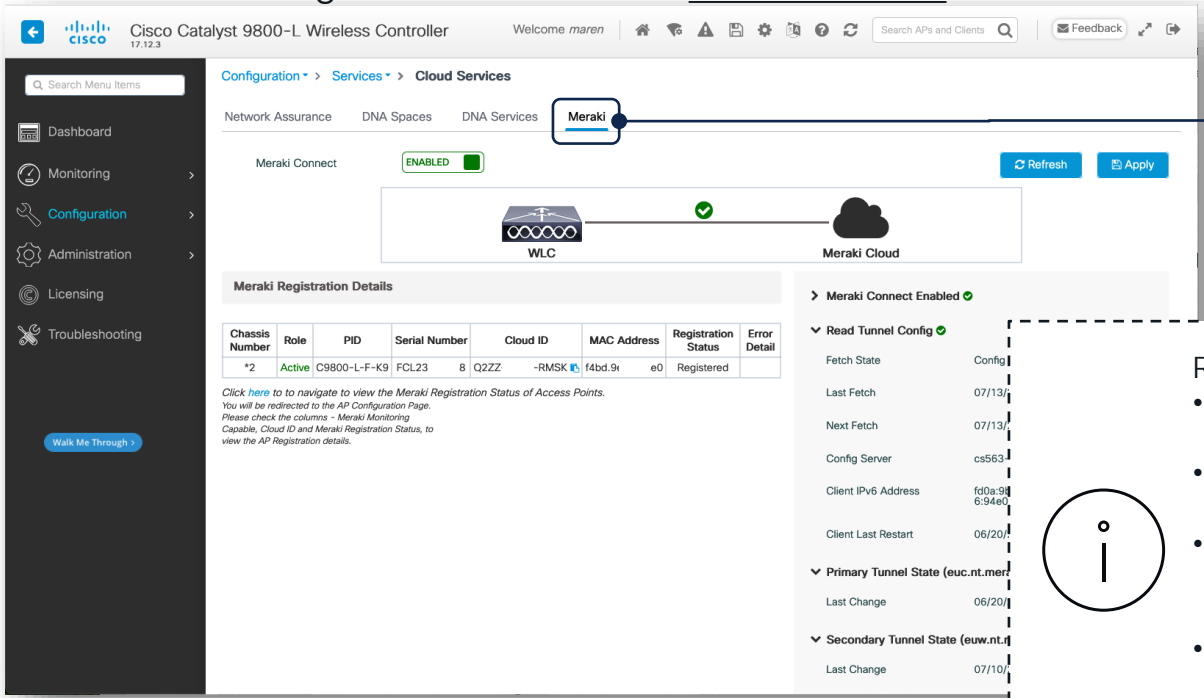
Hybrid: Cloud Connected Wireless Controller



- Native Meraki Tunnel on 9800 Wireless Controllers
- Enables Catalyst customers to get to cloud now
  - leverage existing licensing
  - without new hardware purchase
  - Scale: maximum number of APs per WLC may be lower

Catalyst 9800 Connected to Meraki Dashboard

WLC9800 > Configuration > Services > Cloud Services

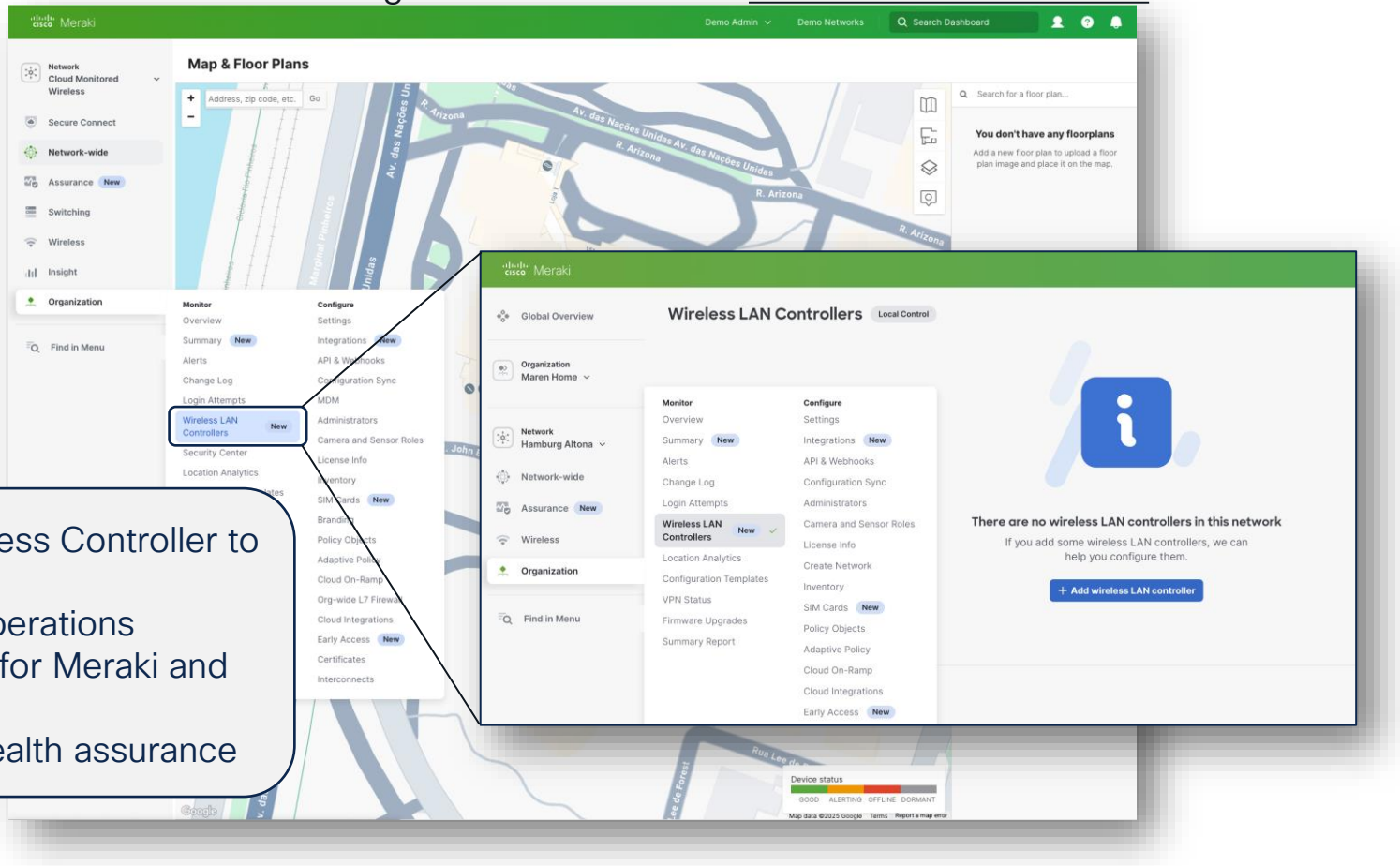


Connect to Meraki!

Requirements for Cloud Connected 9800:

- Software: IOS XE 17.12.3, 17.15.2 or later
- WLCs: all 9800 Models (C9800-CL in H1 CY2025)
- Access Points: All Catalyst Wi-Fi 5 Wave 2, 6, 6E supported (Wi-Fi 7 in H1 CY2025)
- Max. AP Number per WLC:
  - 9800-L:250
  - 9800-40: 1,300
  - 9800-80: 2,000

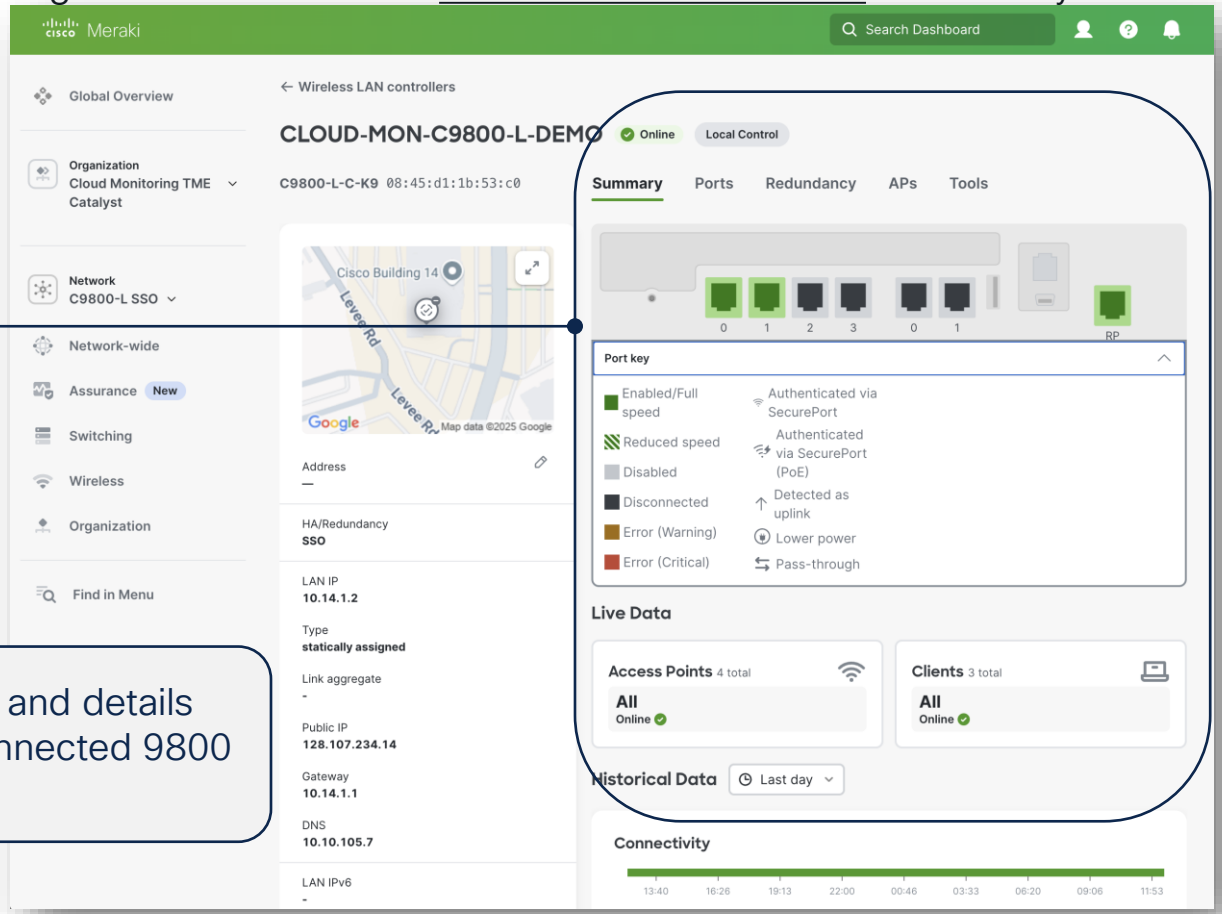
Meraki Dashboard > Organization > Monitor > Wireless LAN Controllers



Add 9800 Wireless Controller to get:

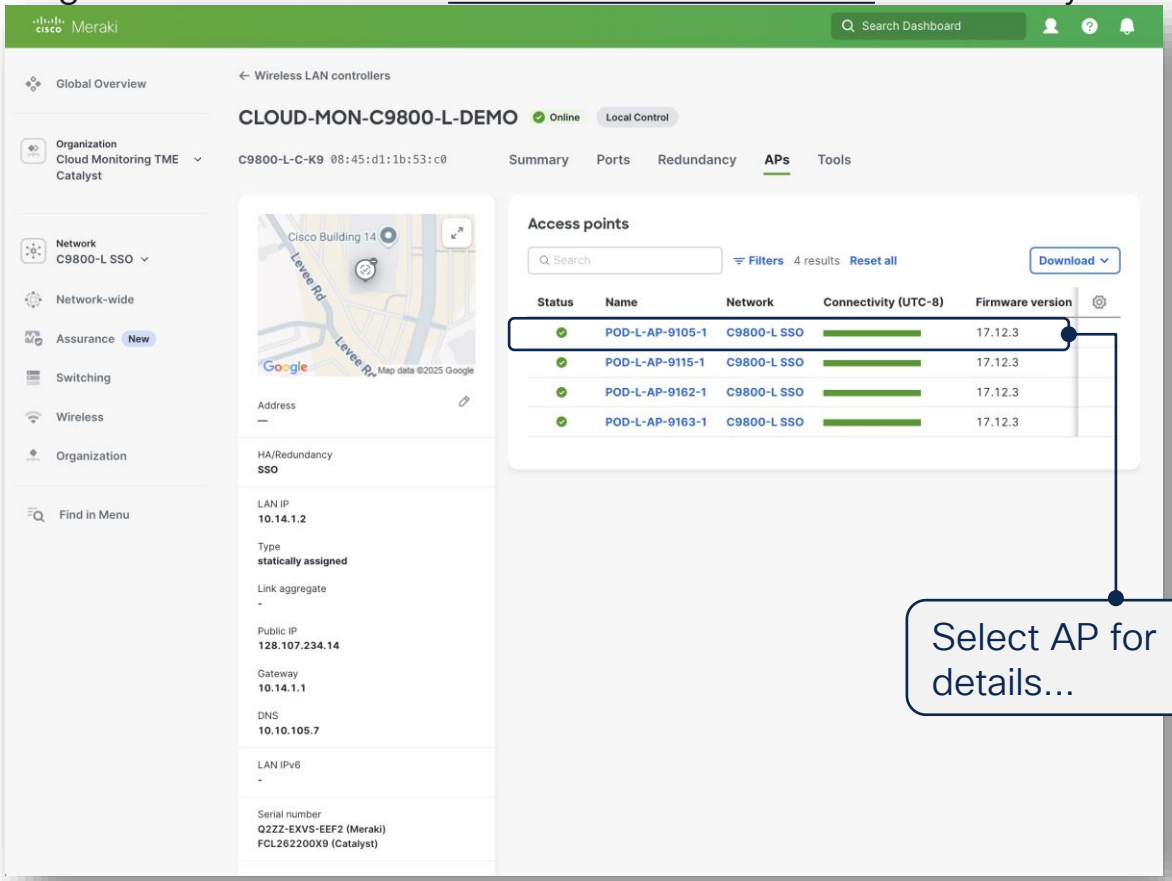
- Simplified operations
- Single pane for Meraki and Catalyst
- Real-time health assurance

Organization > Monitor > Wireless LAN Controllers > Summary



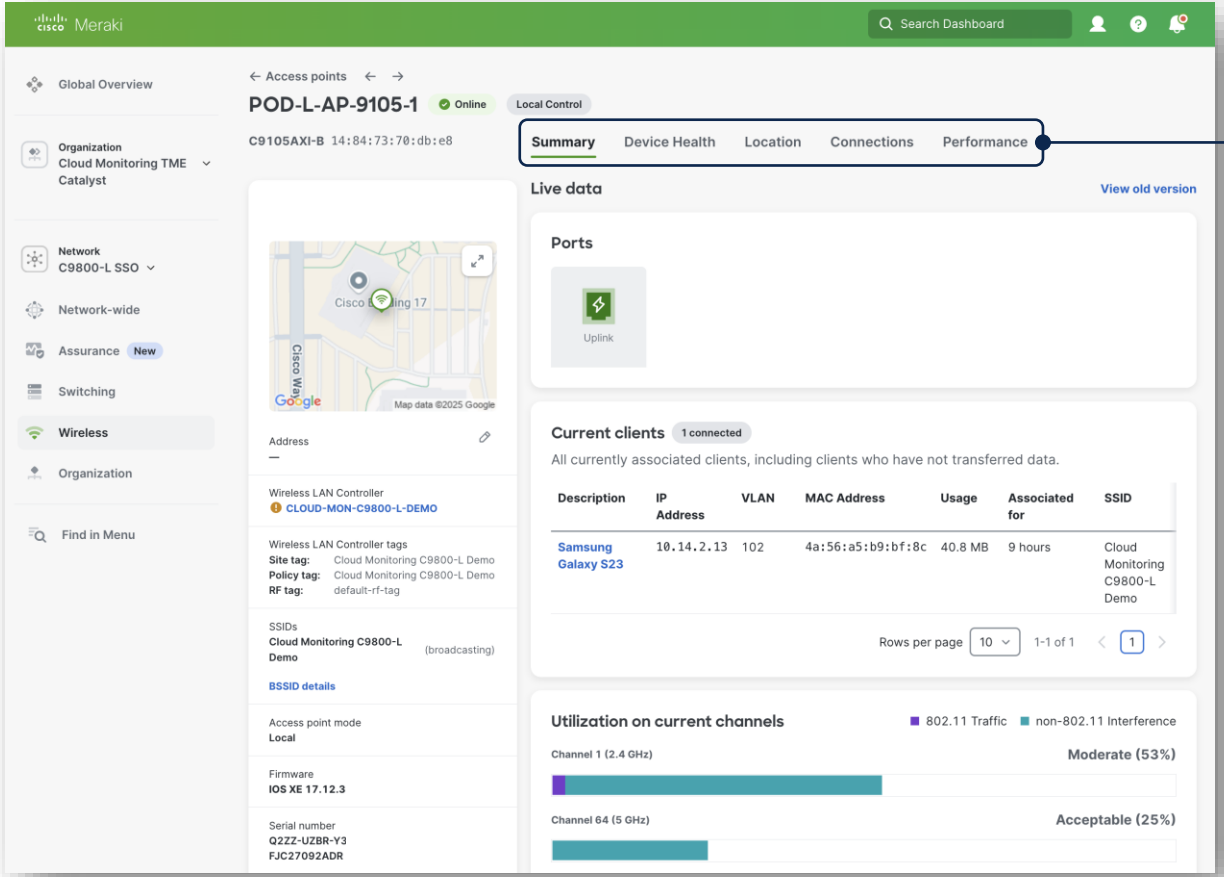
- View Uplink info and details about Cloud Connected 9800 Controller

Organization > Monitor > Wireless LAN Controllers > Summary



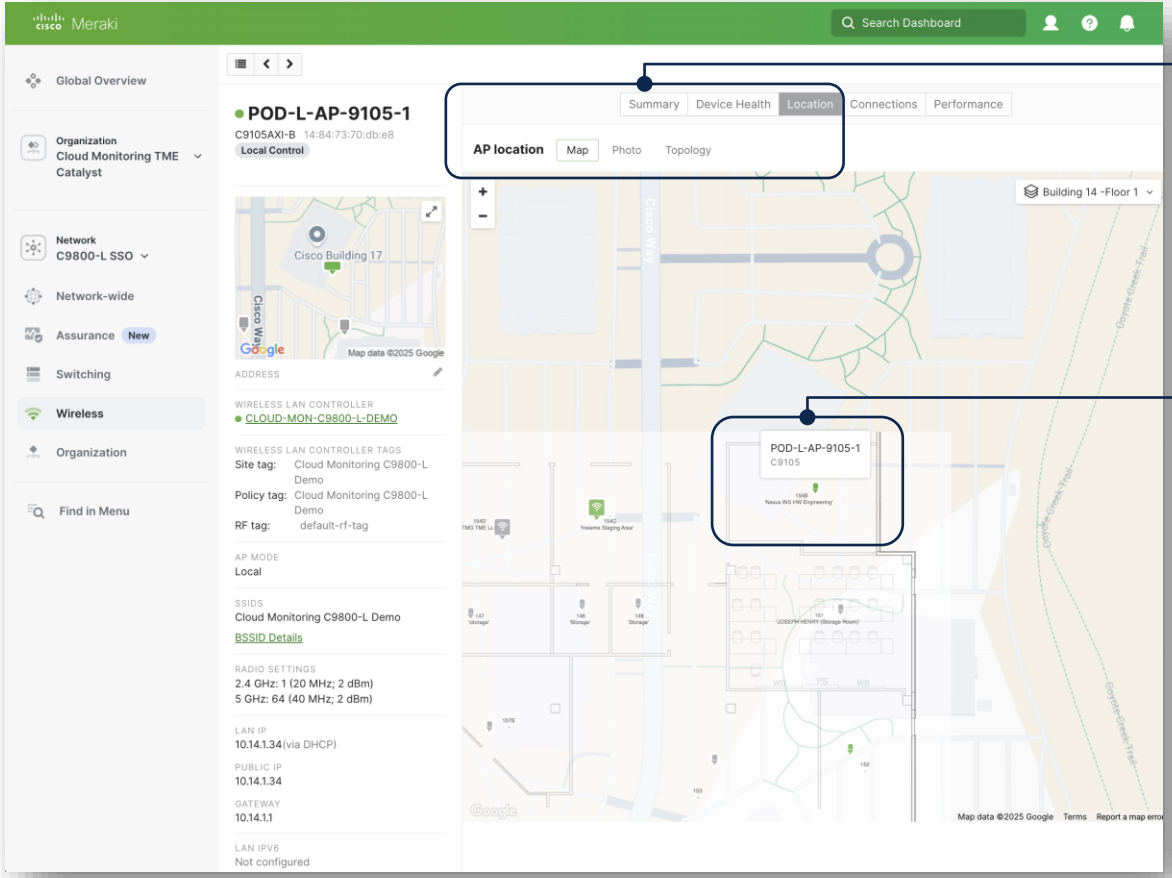
Select AP for details...

Organization > Monitor > Wireless LAN Controllers > *"selected Access Point"*



View Summary Details for selected Access point

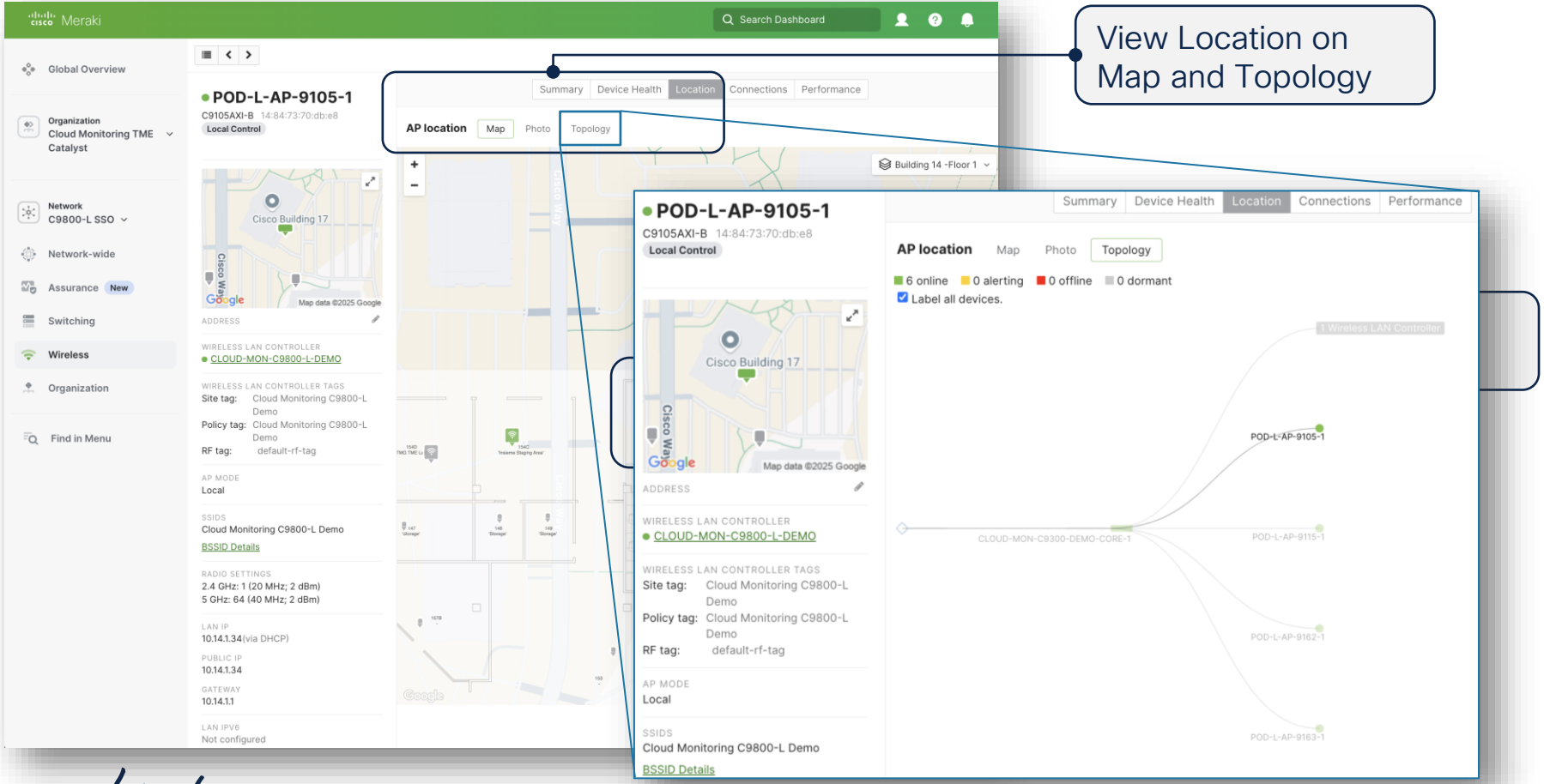
Organization > Monitor > Wireless LAN Controllers > *"selected Access Point"*



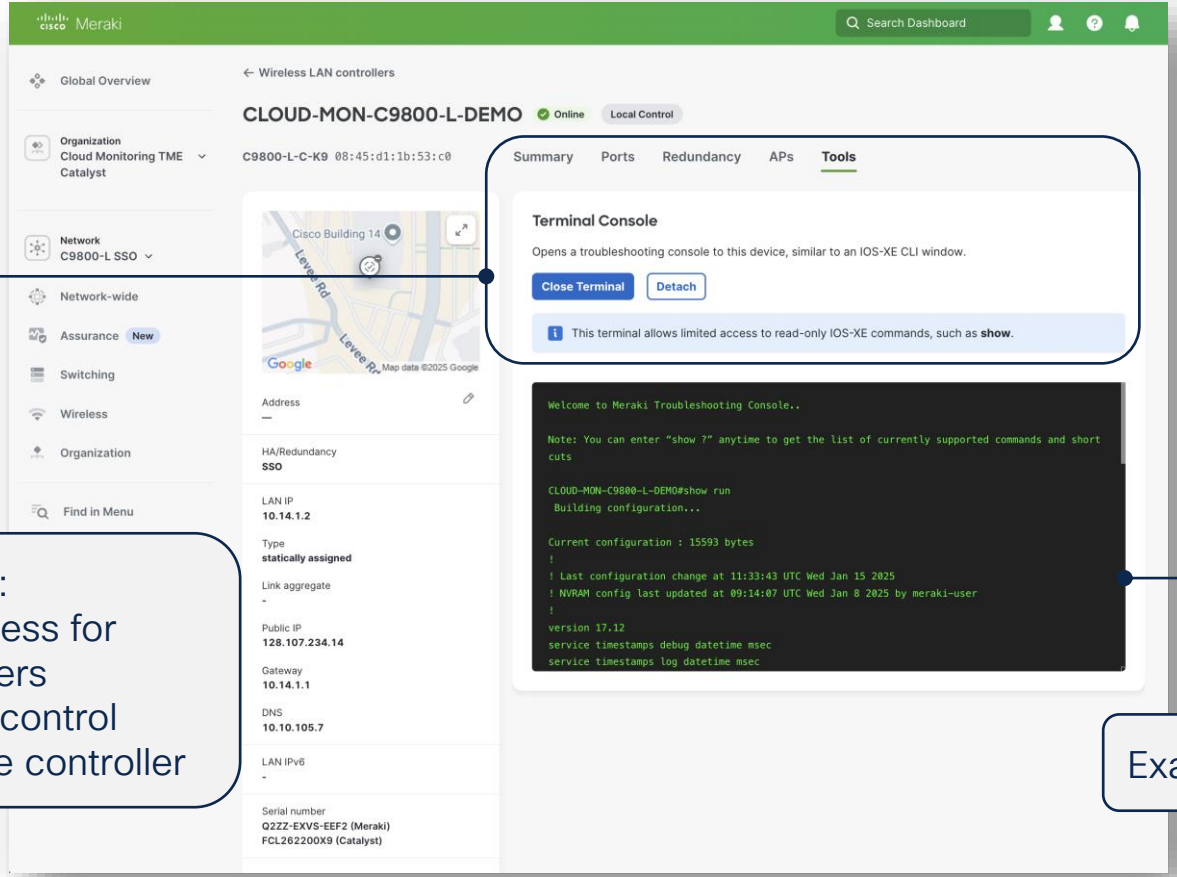
View Location on Map and Topology

Monitored AP on Map: *"POD-L-AP-9105-1"*

Organization > Monitor > Wireless LAN Controllers > *"selected Access Point"*



Organization > Monitor > Wireless LAN Controllers > Tools



Terminal Console:

- **Cloud CLI** access for 9800 Controllers
- Configuration control remains on the controller

Example: *"show run"*

Meraki Dashboard High Availability

- 99.99% uptime service level agreement
- 24x7 automated failure detection & Real-time replication between data centers
- No Wireless/Network downtime if Meraki Dashboard is not reachable

Cisco 9800 Wireless Controllers

Up to 100 APs

C9800-CL (Ultra-Low)
100 APs, 1000 clients
FlexConnect, SD-Access

Up to 500 APs

C9800-L
250/500[1] APs,
5000/10000[1] clients,

Up to 1000 APs

C9800-40
2000 APs, 32,000 clients

C9800-CL (Small)
1000 APs, 10000 clients
Cloud: FlexConnect only

Up to 3000 APs

CW9800M
3000 APs, 32000 clients

C9800-CL (Medium)
3000 APs, 10000 clients
Cloud: FlexConnect only

Up to 6000 APs

CW9800H1 / CW9800H2
6000 APs, 64000 clients,

C9800-80
6000 APs, 64000 clients

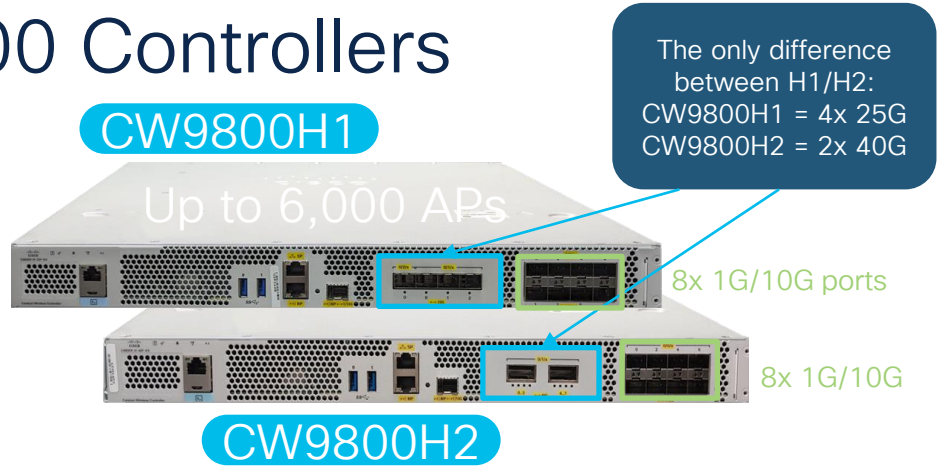
C9800-CL (Large)
6000 APs, 10000 clients
Cloud: FlexConnect only

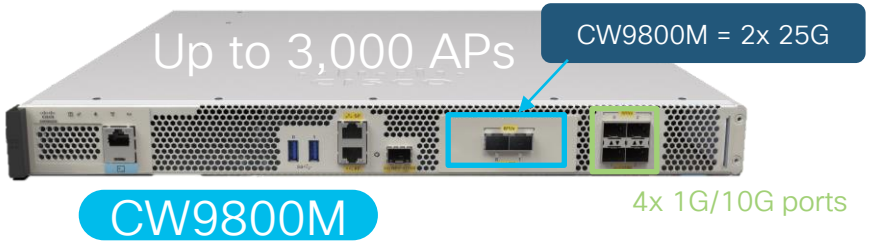
[1]With performance license

New Cisco Wireless 9800 Controllers

Improved Energy Efficiency!

- CW9800 Series Feature List is on par with previous Gen WLC 9800
- Familiar WebUI and config structure





Flexible uplinks: 1G, 10G, M & H1 25G H2: 40G

CW9800 H1/H2 & M:
- Software: IOS XE 17.14.1 or later
- Catalyst Center: 2.3.7.x
- ISE: 3.1+
- Prime Infrastructure: no support

Agenda

1. Wi-Fi 7 & APs
2. Platform Choices
3. Simplified Operation
4. Location Services
5. Secure!
6. Built in IoT

Simplified Operations

- AI-RRM
- AI Networking Assistant
- AP Auto Locate

How to provide great coverage and limit Co-Channel interference?

Cisco Radio Resource Management (RRM)

+

Meraki Auto RF

+

AI

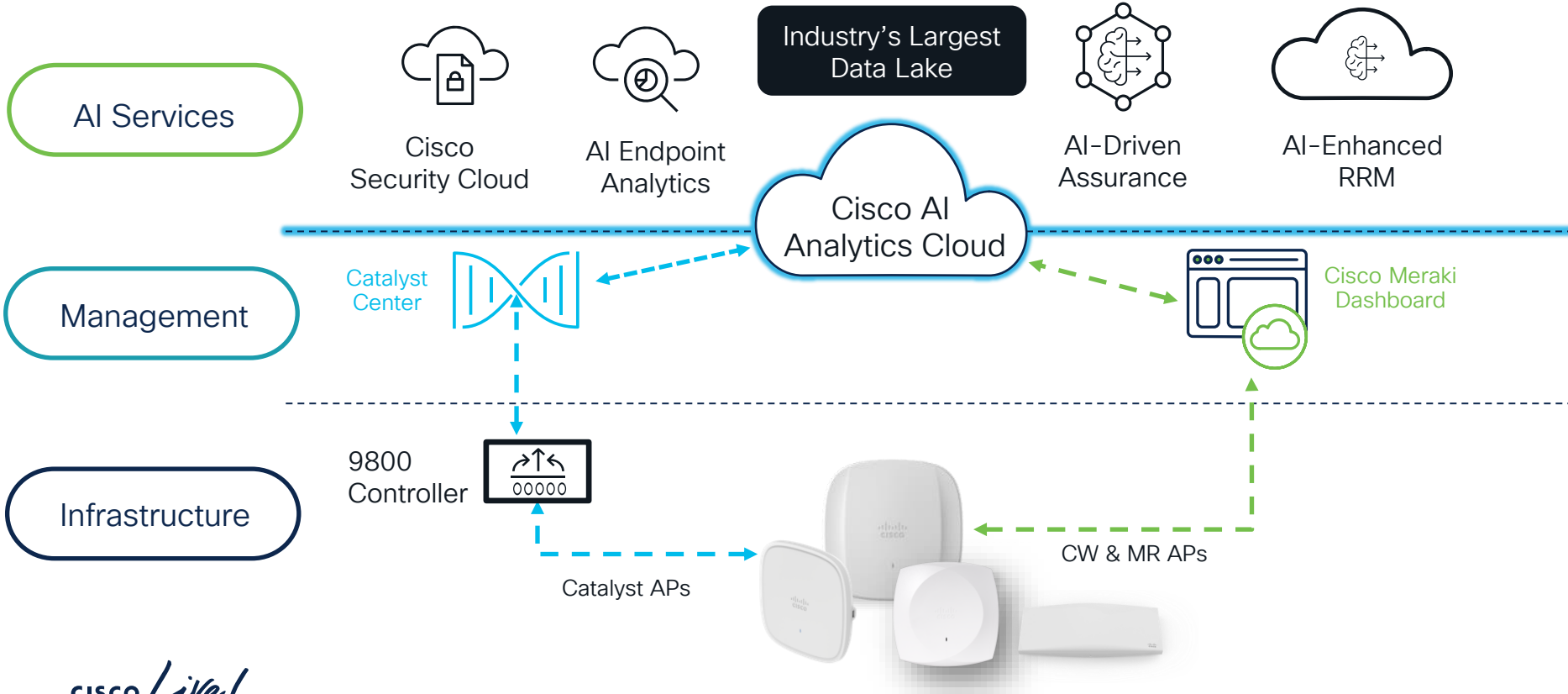
AI-Enhanced RRM: Improves Wireless Reliability

Trend-Based RRM
Optimize RF with weeks of historical analysis

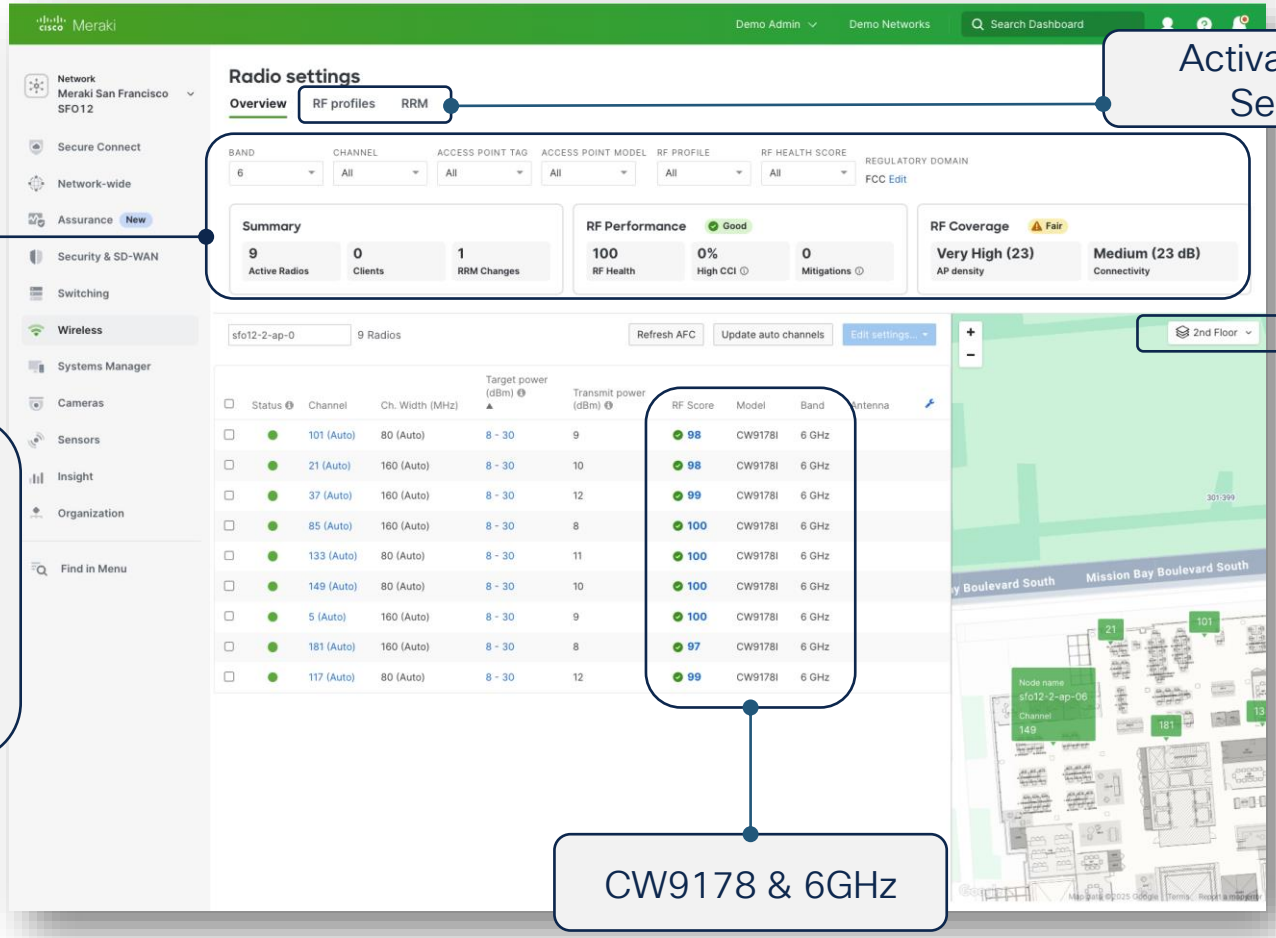
Flexible Radio Assignment
Optimize band selection to minimize 2.4 GHz interference

Busy Hour Aware
Minimize disruptive changes during the critical times of day

Unified Intelligence across Cisco Wireless



Meraki Dashboard > Wireless > Radio Settings > Overview



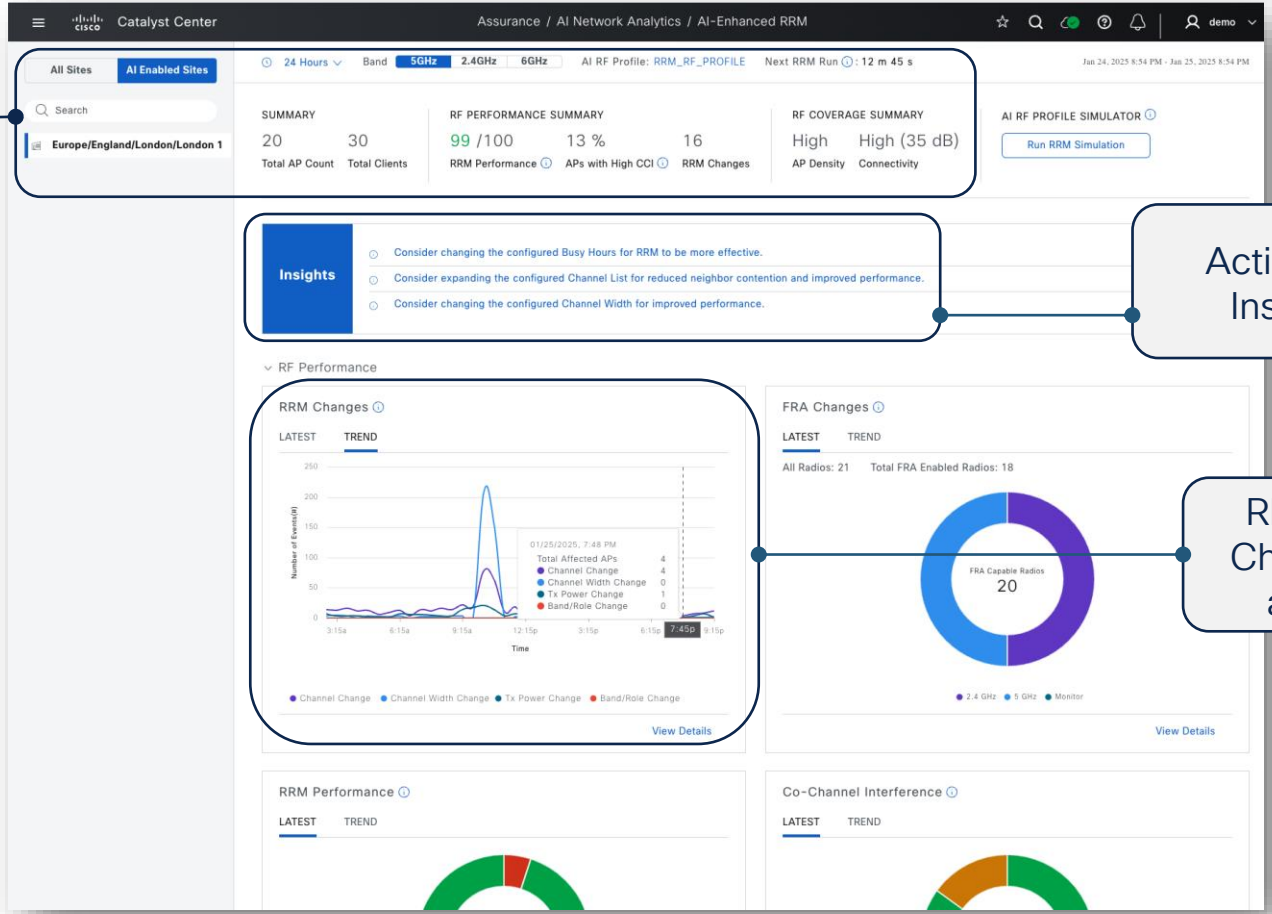
Activation and Settings

RF Performance & Coverage according to selected parameters

Per Floor View

CW9178 & 6GHz

Catalyst Center > Assurance > AI Network Analytics > AI-Enhanced RRM



Summary for selected location (*London1*) and time-window (*24 hr*)

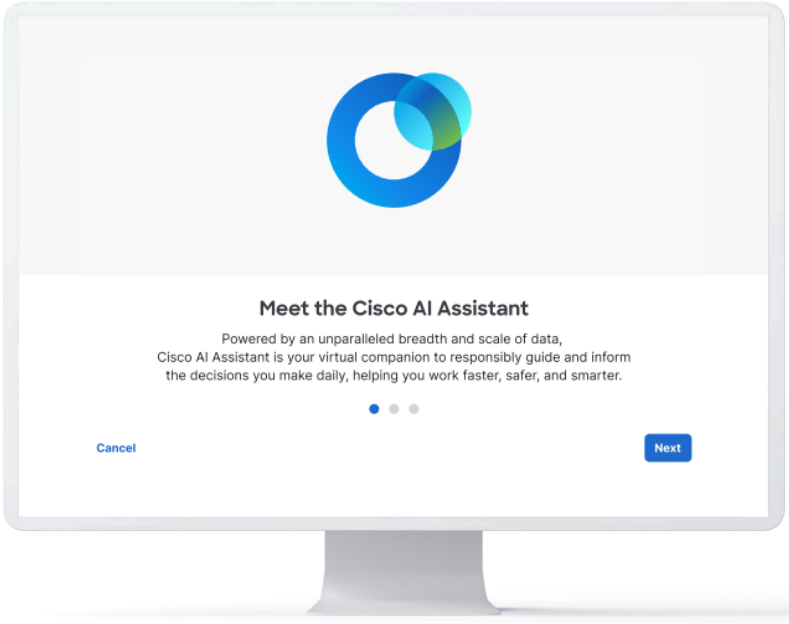
Actionable Insights

RRM Channel Change History and Details

Simplified Operations

- AI-RRM
- AI Networking Assistant
- AP Auto Locate

Cisco AI Assistant: Unlock network intelligence

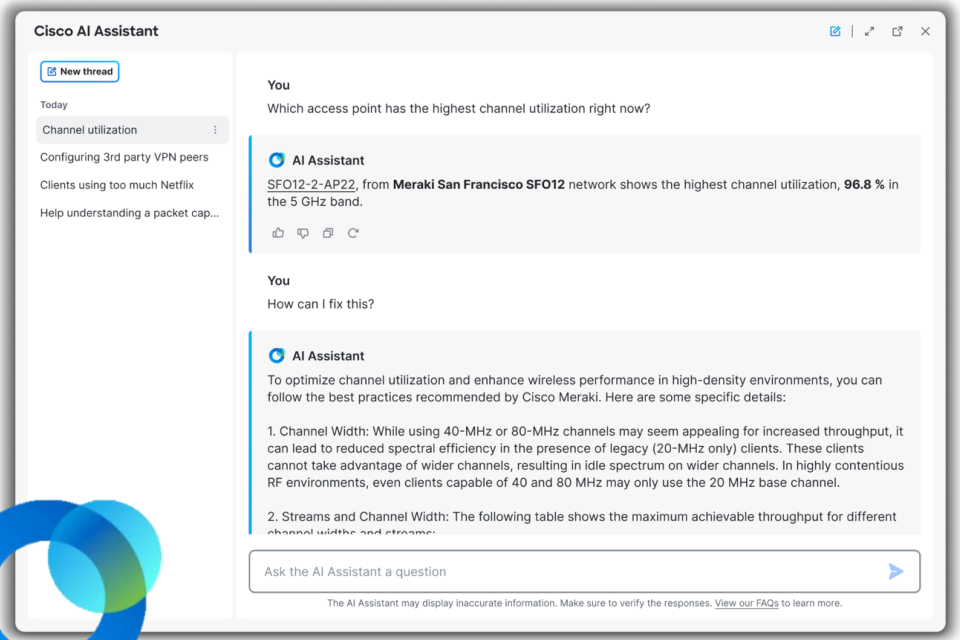


Empower IT Teams

Reduce management costs

Optimize network performance and reliability

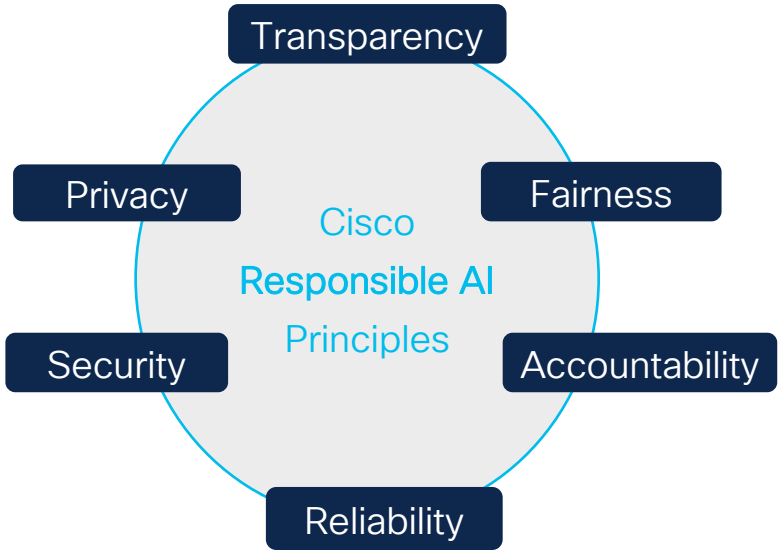
AI Assistant for Networking



- ✓ Documentation Questions
- ✓ Network Visibility and Config
- ✓ Network Diagnostics
- ✓ Network Optimization

AI Assistant Availability:
- Meraki Dashboard: private Beta
- Catalyst Center: private Beta w/ 2.3.7.9

Preserving your trust with AI governance

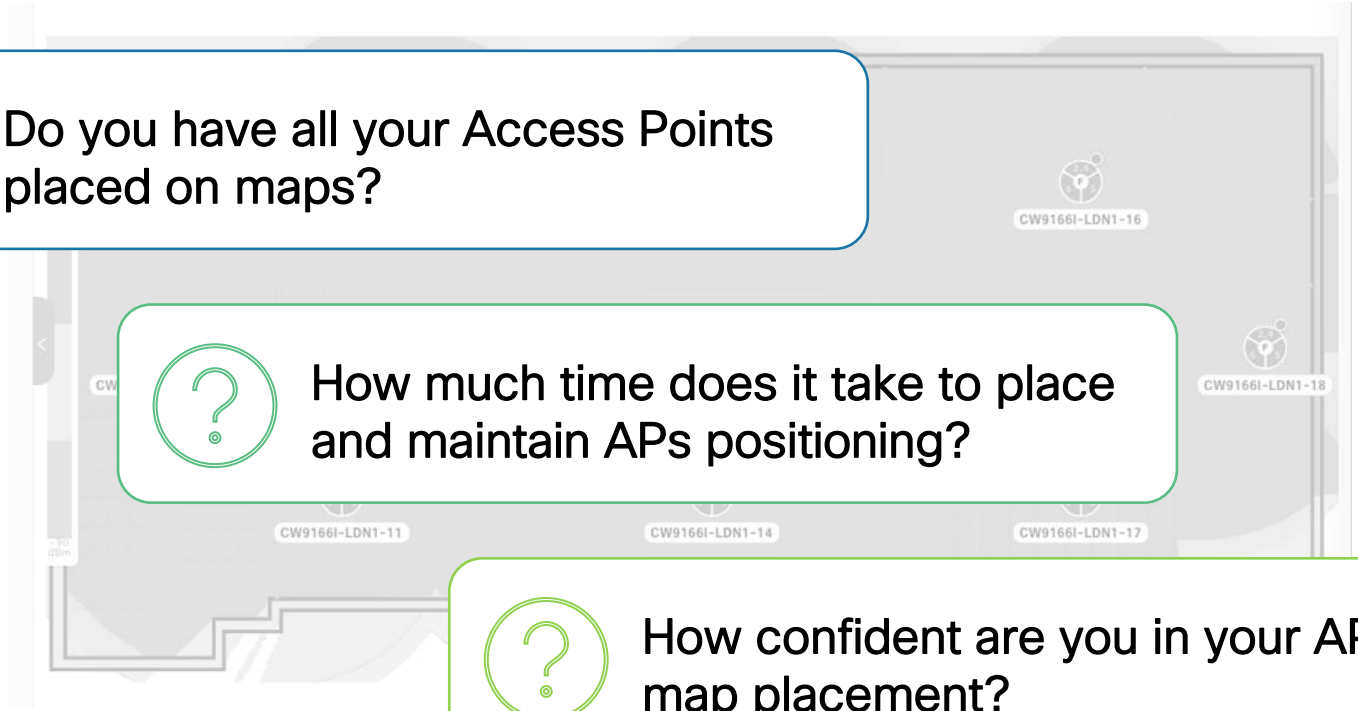


- Queries Privacy
  - Each user and associated chat thread are kept separate
  - Users chat history is preserved but can be deleted at any given time
- LLM Training Model Privacy
  - Customers questions/responses are not used to train the model
  - Data is stored within Cisco boundary
  - Feedback per organization/user is evaluated to improve overall accuracy to response

Simplified Operations

- AI-RRM
- AI Networking Assistant
- AP Auto Locate

Let’s talk about Access Points on Maps…



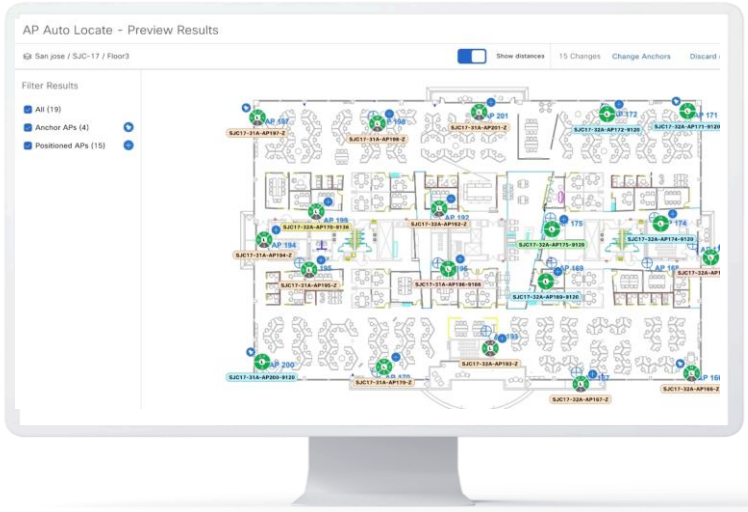
Do you have all your Access Points placed on maps?

How much time does it take to place and maintain APs positioning?

How confident are you in your AP map placement?

Cisco introduces “AP Auto Locate” to fix your Map Problem!

Auto-position APs on maps!



Reduce IT admin workload with faster network deployments

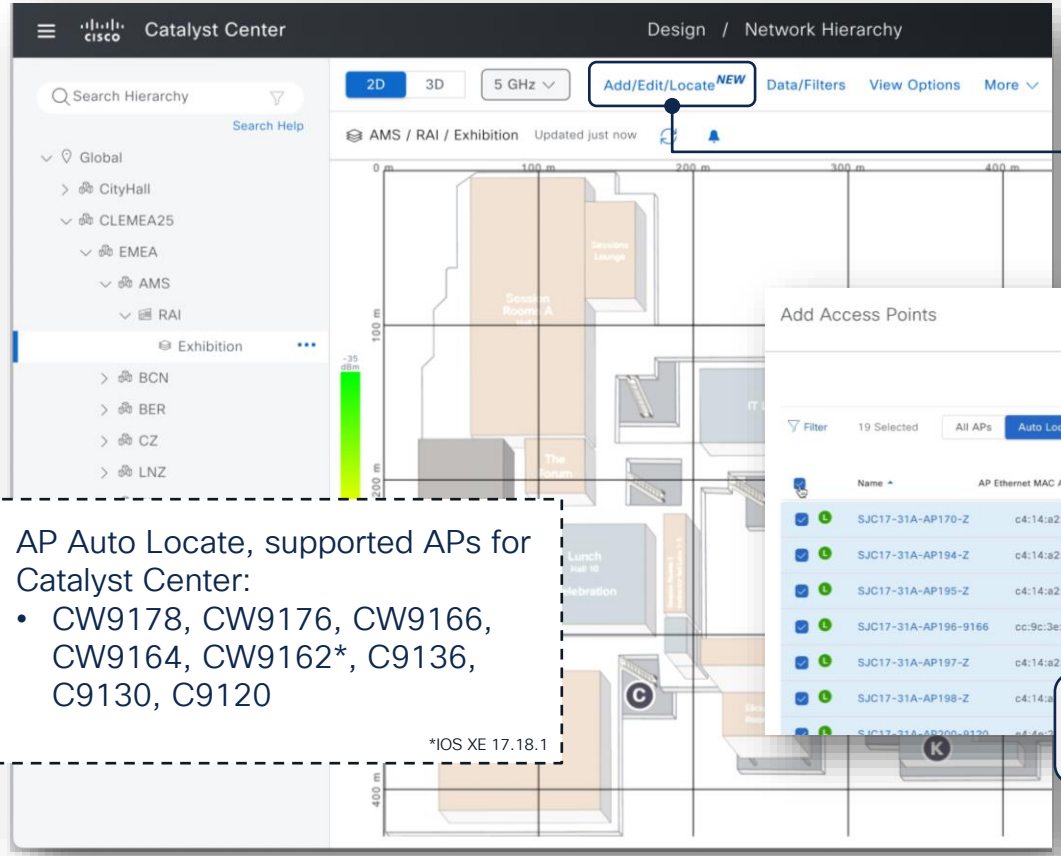
AI

Quality input for AI-driven operations & assurance

Reduce troubleshooting effort caused by incorrect AP placement

Improve client location services accuracy

Catalyst Center > Design > Network Hierarchy



Select *Add/Edit/Locate* to place APs with “AP Auto Locate”

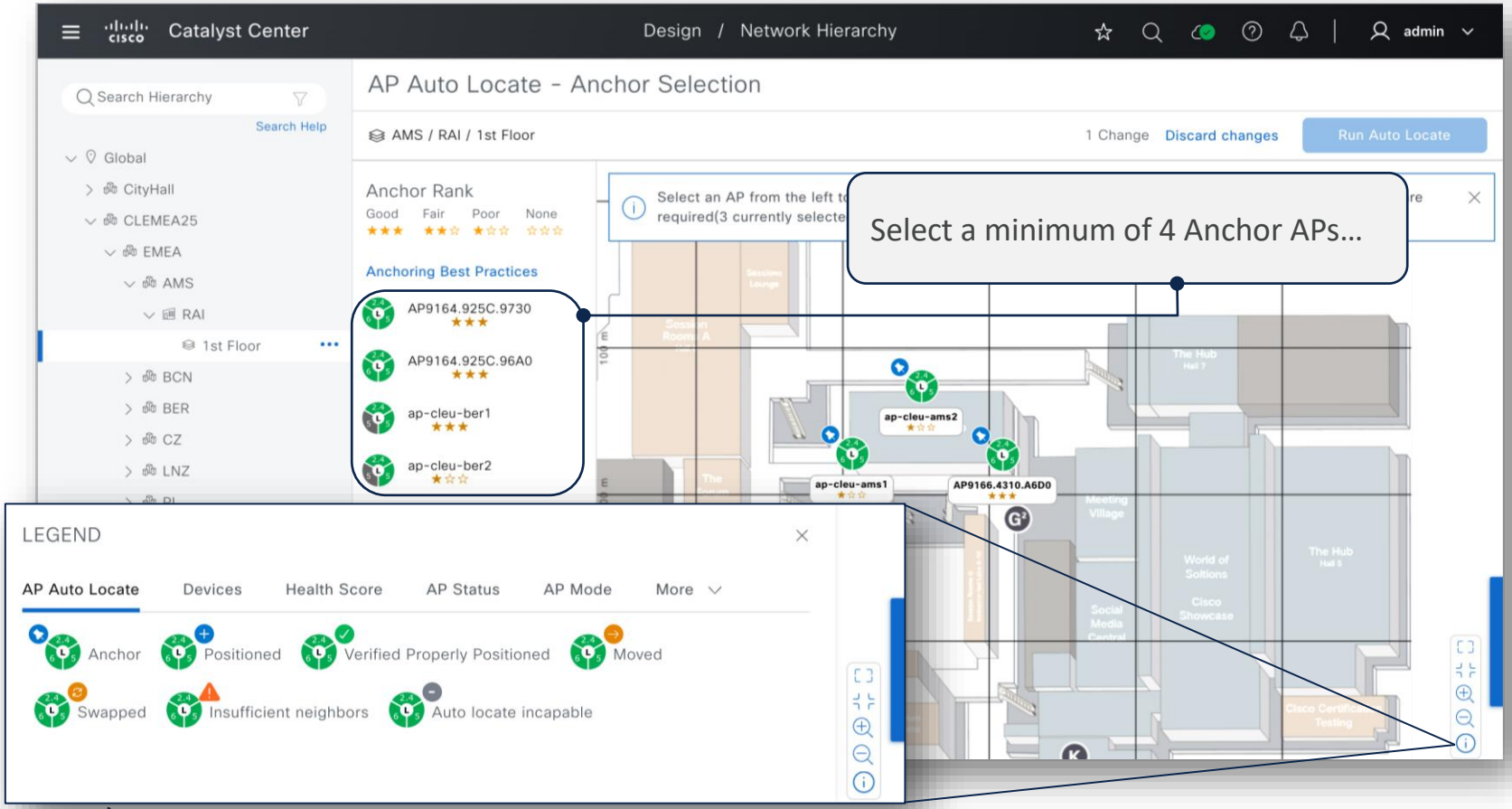
AP Auto Locate, supported APs for Catalyst Center:

- CW9178, CW9176, CW9166, CW9164, CW9162*, C9136, C9130, C9120

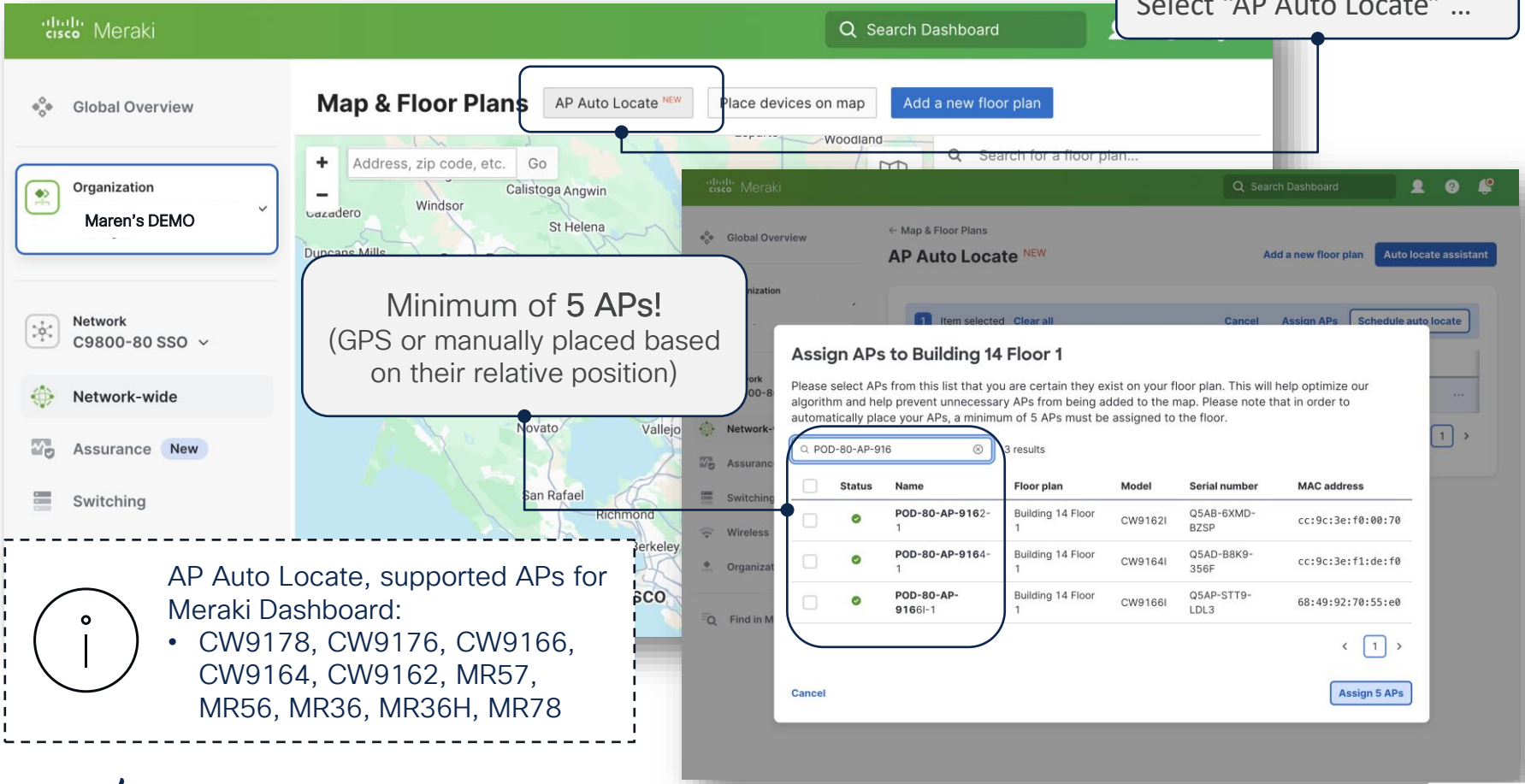
*IOS XE 17.18.1

Add APs to Map for Auto-Placement…

Catalyst Center > Design > Network Hierarchy > AP Auto Locate



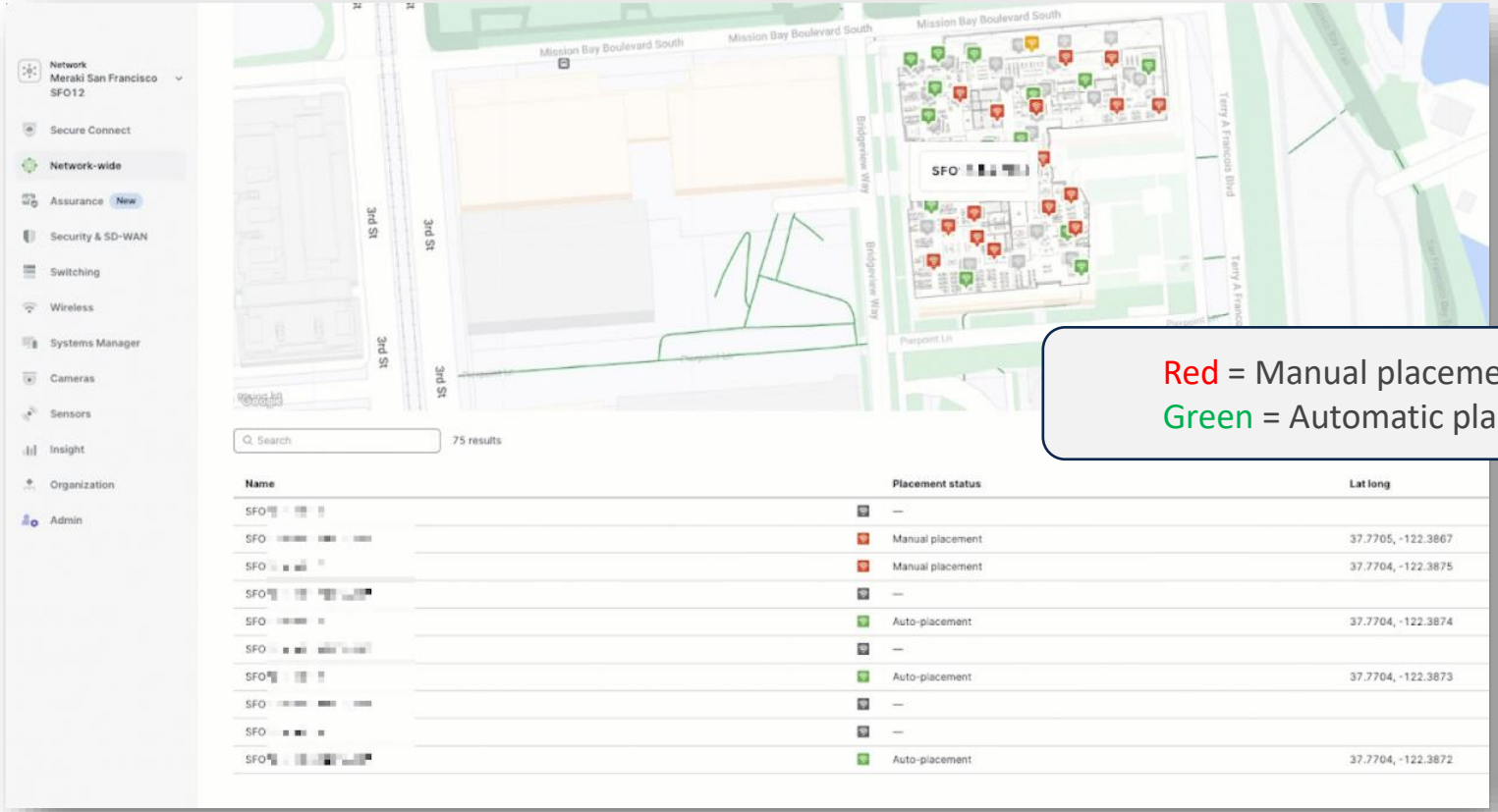
Meraki Dashboard > Network-wide > Map & floor plans



AP Auto Locate, supported APs for Meraki Dashboard:

- CW9178, CW9176, CW9166, CW9164, CW9162, MR57, MR56, MR36, MR36H, MR78

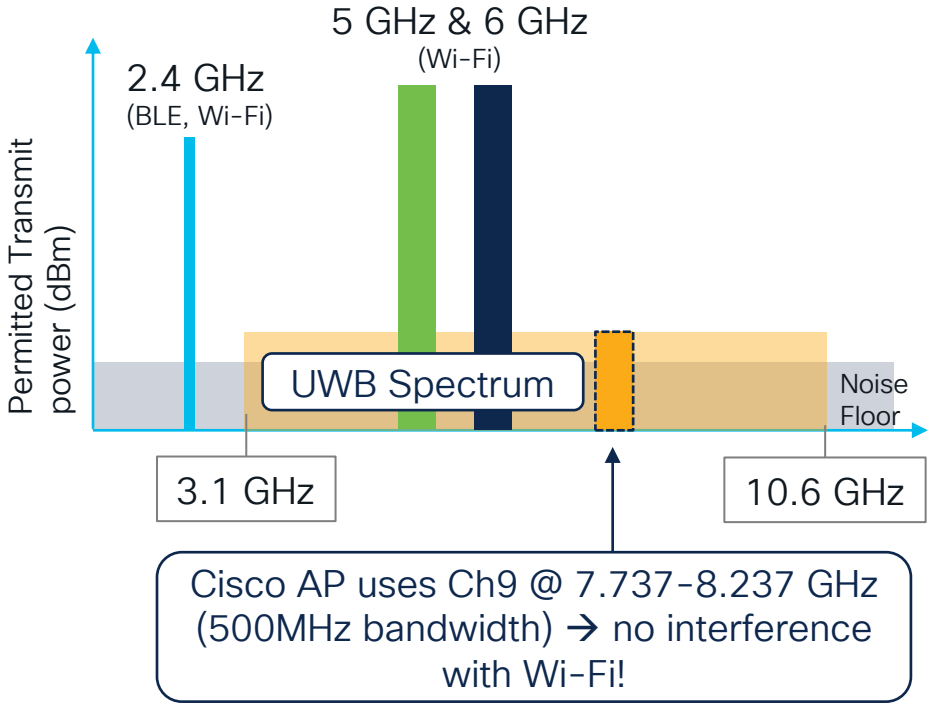
Meraki Dashboard > Network-wide > Map & floor plans



Red = Manual placement
Green = Automatic placement

Ultra Wide-Band (UWB)

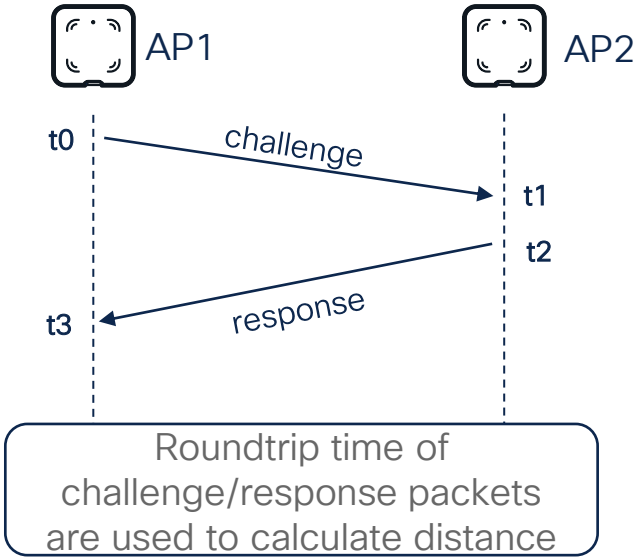
Integrated with Access Points CW9176 & CW9178



AP Auto Locate is using UWB

Integrated with Access point CW9176 & CW9178

- UWB enhances the accuracy of AP Auto Locate
- Combining information from UWB with Wi-Fi Fine Timing Measurement (FTM) on 5GHz and 6GHz.

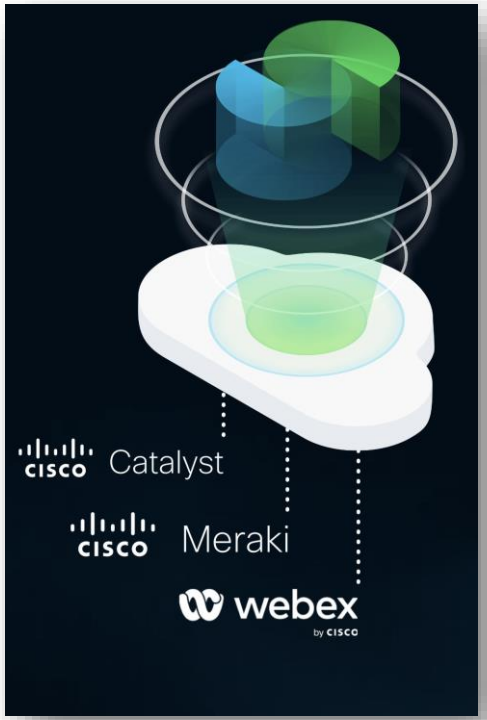


AP Auto Locate with UWB support:
- Cisco Spaces: available
- Catalyst Center: 2.3.7.9
- Meraki: FTM now, UWB Beta H1 CY25

Agenda

1. Wi-Fi 7 & APs
2. Platform Choices
3. Simplified Operation
4. Location Services
5. Secure!
6. Built in IoT

What is Cisco Spaces?



Leverages data and **location** information from **Wi-Fi**, BLE, UWB and IoT devices to improve operations and **drive business outcomes**

Cloud **Platform**. Cisco Native & Partner Apps, APIs, monitoring

Secure & Compliant
(GDPR, PDPA, ISO 27001, SOC Type 1)

Designed to **Scale**! Proactive monitoring & support. **99.9%** uptime

Wi-Fi 7 Unified Licensing includes Cisco Spaces

cisco SPACES

UL – Essentials

- Meraki Enterprise
- DNA-E
- Spaces Extend

UL – Advantage

- Meraki Advanced
- DNA-A
- Spaces ACT

Cisco Spaces Deployment Options

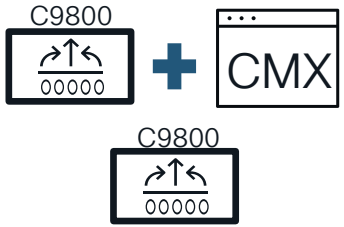
Cloud to Cloud

- Cisco Spaces to connect to Meraki Dashboard
- Cisco Spaces to connect to 3rd Party cloud Services

Cloud to On-Premise

- Catalyst Center is synched with Cisco Spaces
- WLC 9800 (via Connector VM) is synched with Cisco Spaces

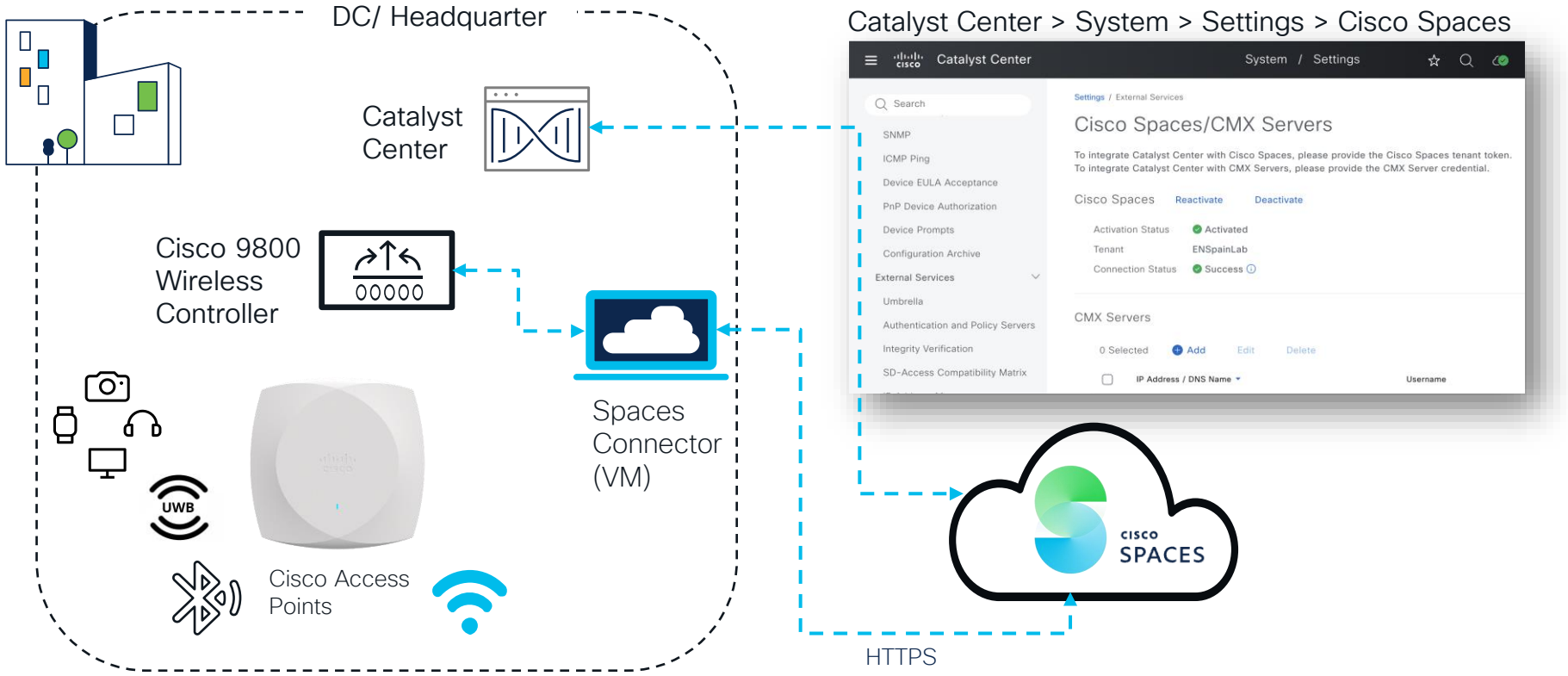
On-Premise



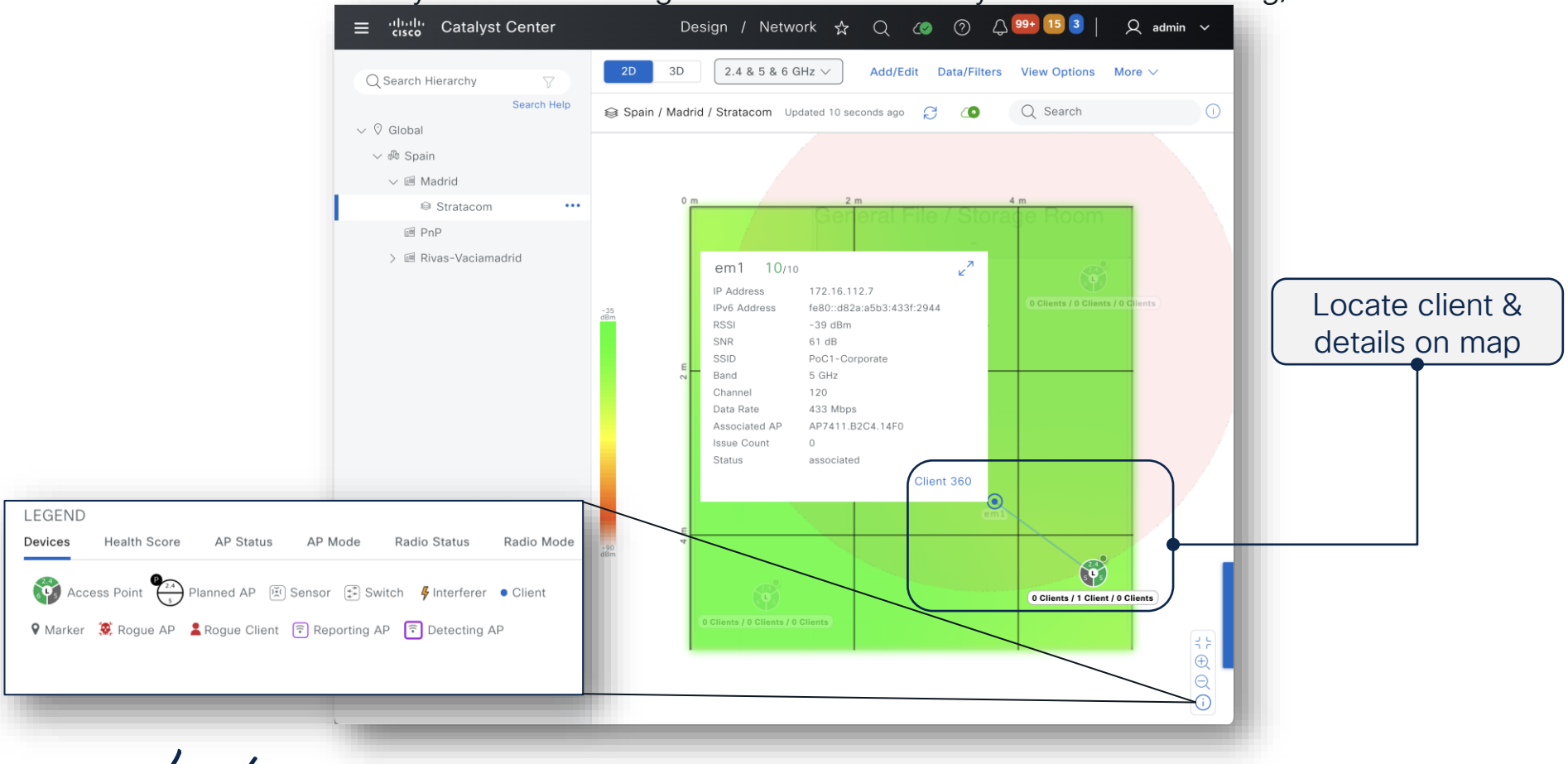
- Location Calculation embedded in CMX Appliance (Wi-Fi only)
- Location Module embedded in C9800 Wireless Controller (BLE only)

NEW

Add Cisco Spaces to Catalyst Center

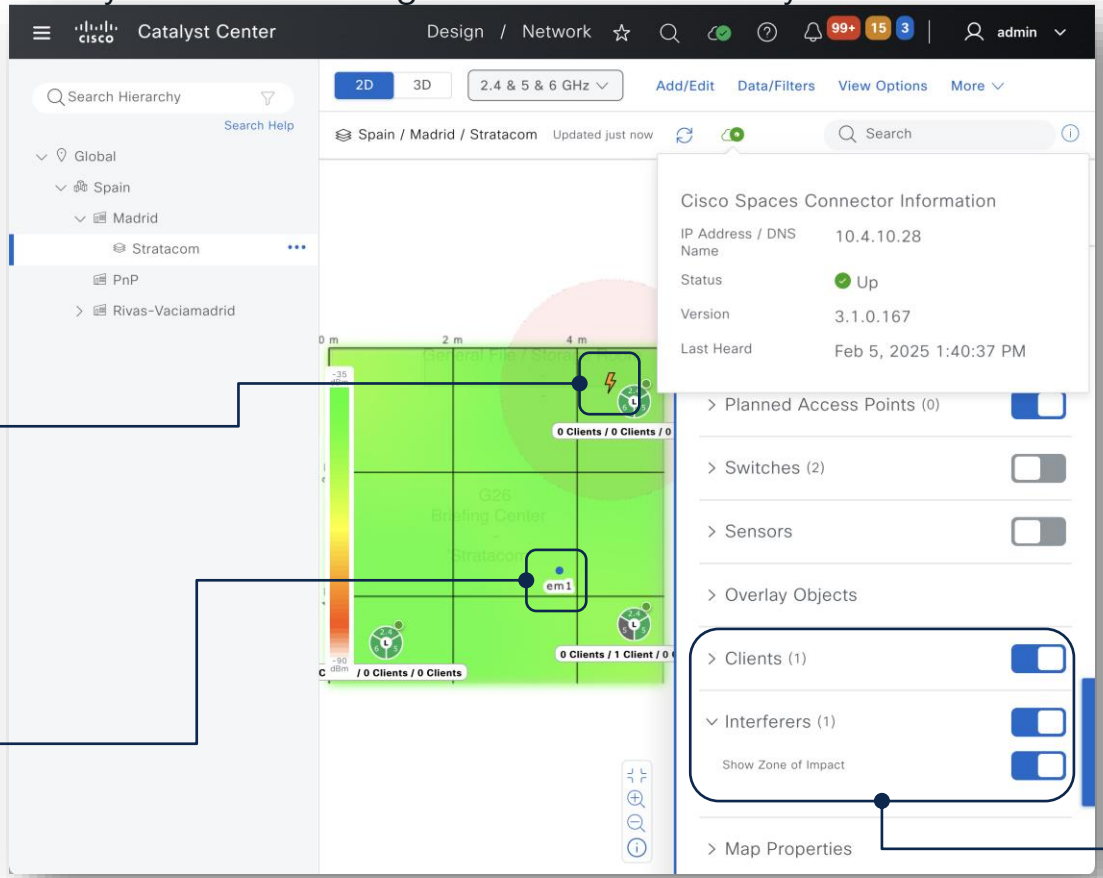


Catalyst Center > Design > Network Hierarchy > *“selected Building/Floor”*



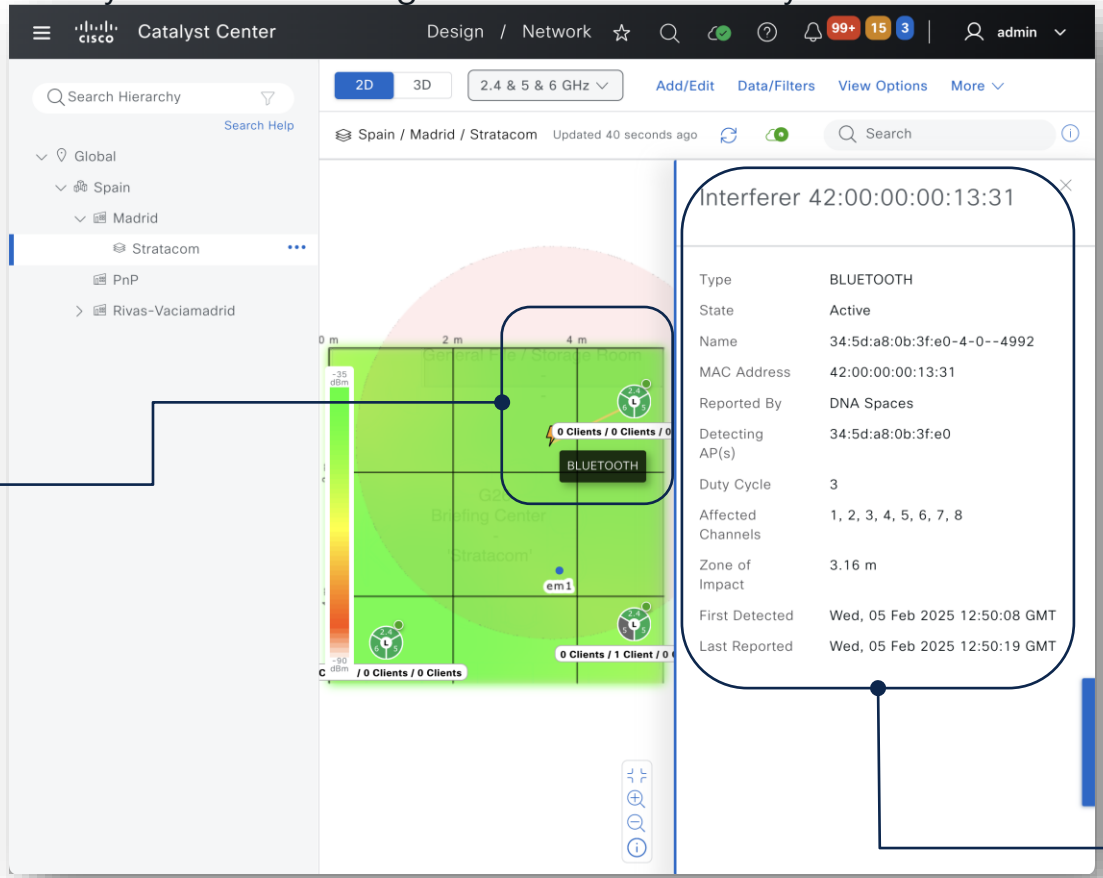
Locate client & details on map

Catalyst Center > Design > Network Hierarchy > *“selected Building/Floor”*



Catalyst Center > Design > Network Hierarchy > *“selected Building/Floor”*

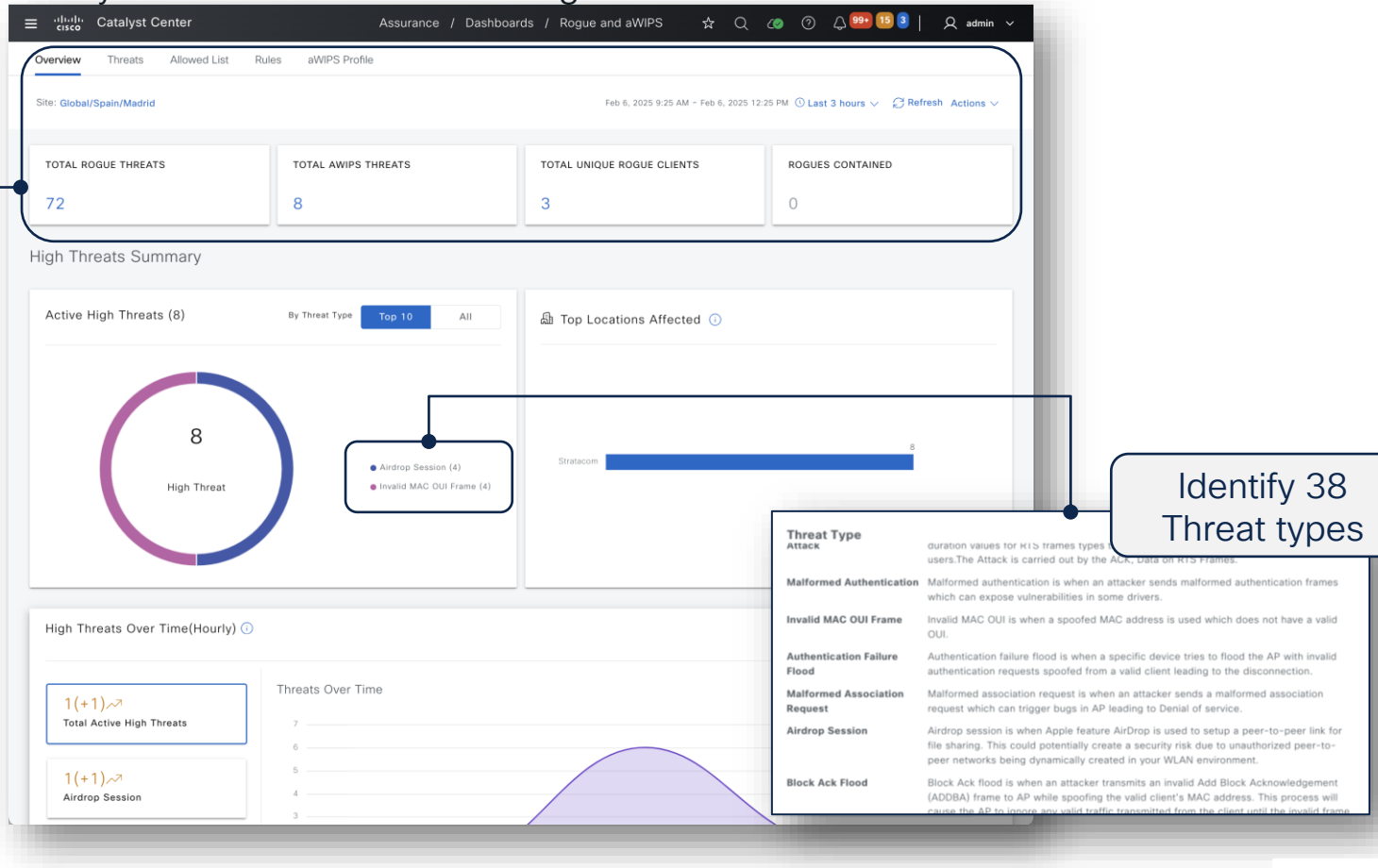
Bluetooth interferer and zone of impact



CleanAir Pro

Interferer Details provided by Cisco CleanAir Pro

Catalyst Center > Assurance > Rogue and aWIPS

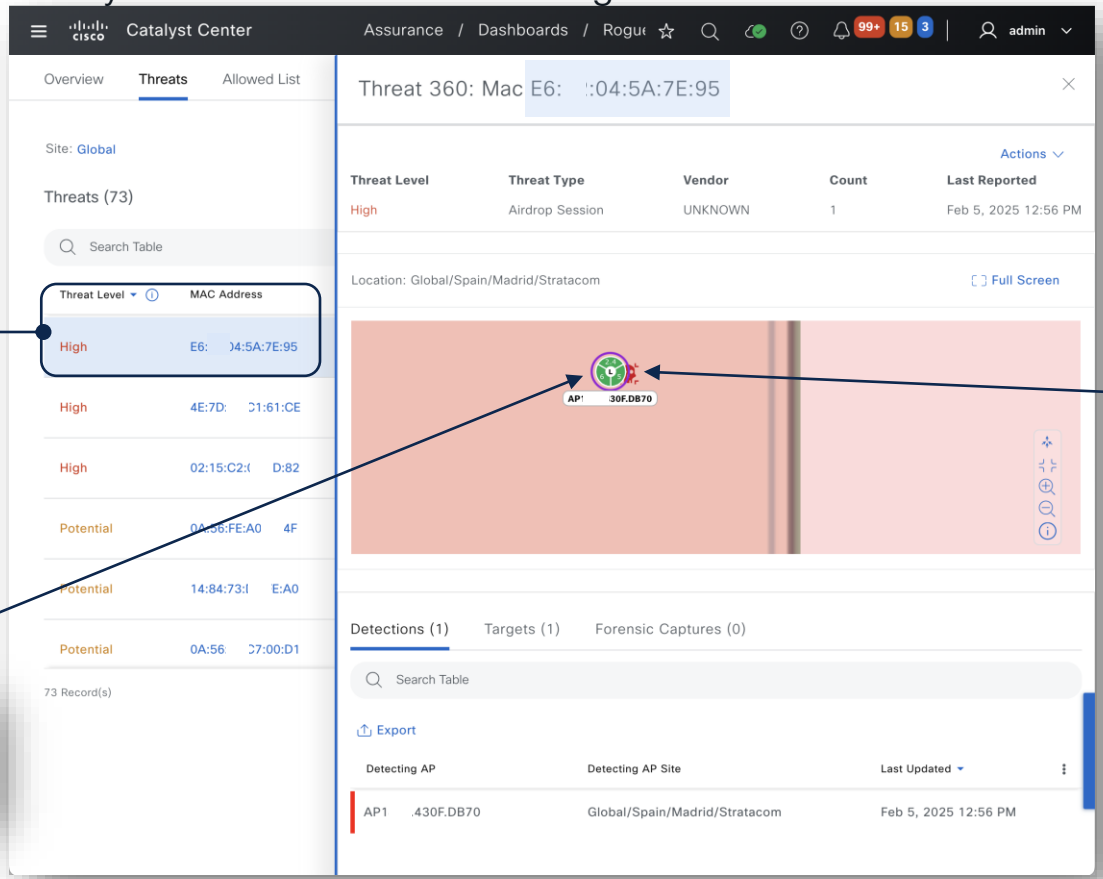


Built-in Rogue & aWIPS Dashboard in Catalyst Center!

Per site reporting and action dashboard

Identify 38 Threat types

Catalyst Center > Assurance > Rogue and aWIPS > Threats



Selected Threat (Airdrop Session)

Detecting AP

Location on Map!

Rogue AP

Cisco Spaces turns your Network into a Sensor

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

Panic Buttons

- Button Alert, Location

Environmental Monitors

- Temp, humidity
- CO2, Air quality

Occupancy (wired & wireless)

- People Count
- Presence

The Solution: How it all comes together

Business Outcomes

Native & Partner Apps

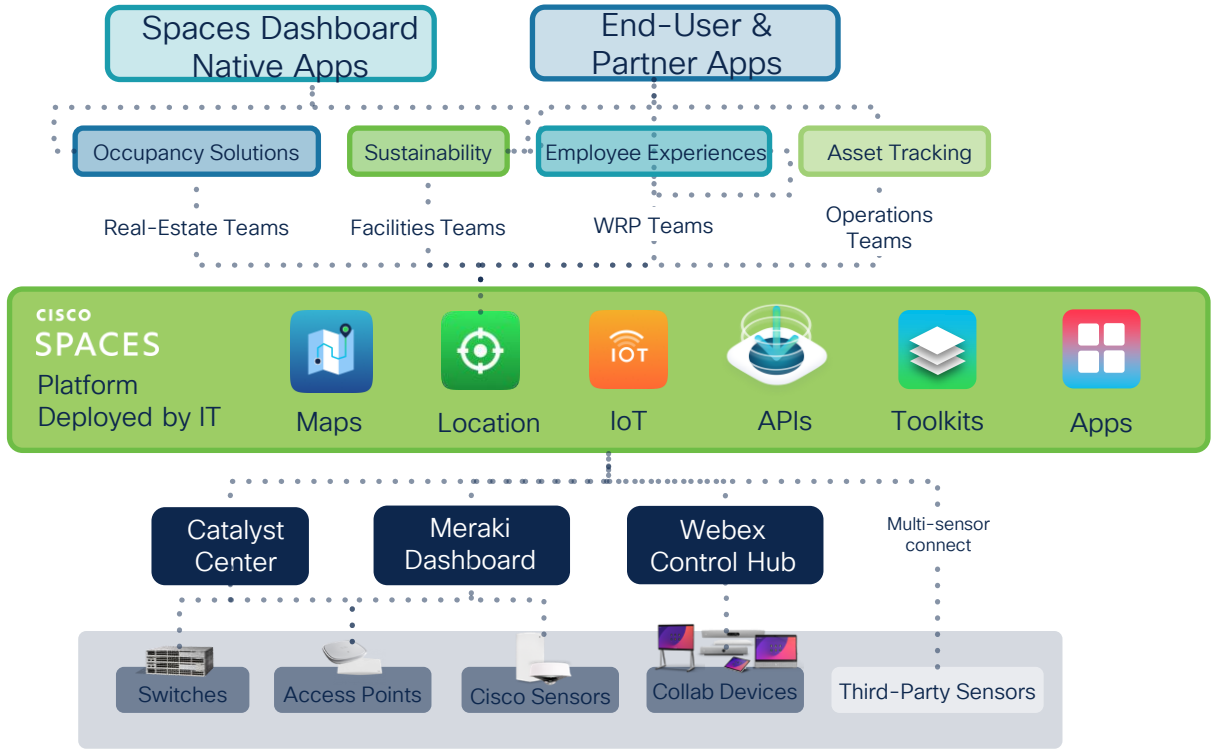
Software

Smart Spaces Stack

Powered by Cisco Spaces

Hardware

Cisco Hardware as the Foundation



Cisco Spaces is Designed to address the needs of every industry

- Occupancy Analytics
- Enhance Employee Experience
- Indoor Navigation
- Sustainable Meeting Rooms
- Hot Desking

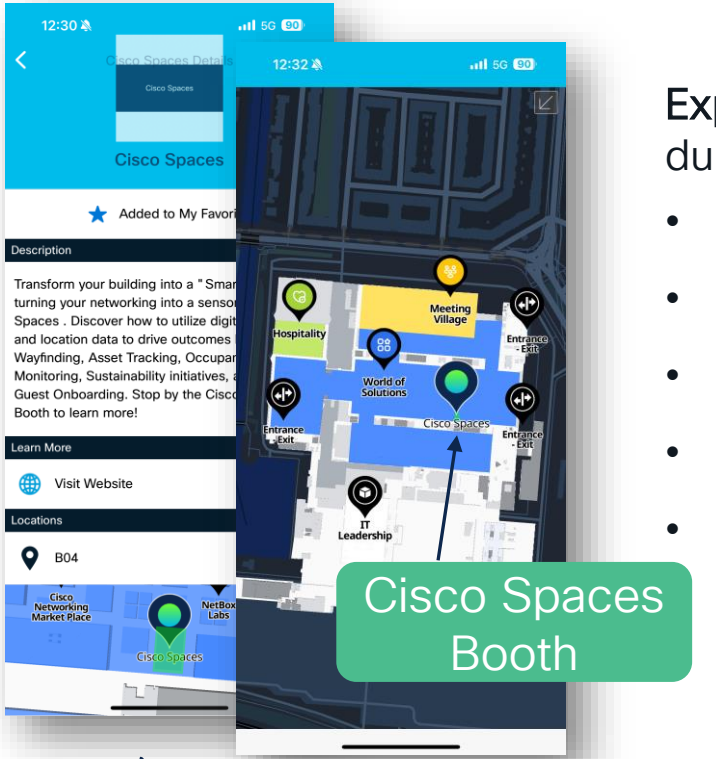
- Seamless Wi-Fi Onboarding
- Indoor Navigation
- Infant Monitoring & Patient Safety
- Asset tracking
- Panic Buttons for Staff Safety

- Customer Acquisition & Loyalty
- Personalized Engagements
- Indoor Navigation
- Occupancy analytics
- Asset tracking

- Heavy Equipment & Asset Tracking
- Machine Condition Monitoring
- Employee Safety

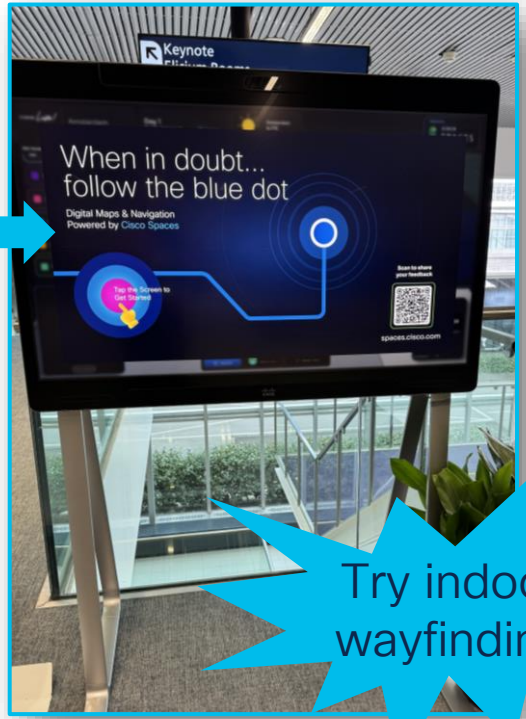
Visit Cisco Spaces Booth & try Wayfinding!

World of Solutions Hall 1, B04



Experience Cisco Spaces during Cisco Live:

- Indoor Wayfinding
- Asset Tracking
- Occupancy Monitoring
- Guest Onboarding
- Sustainability Initiatives



Agenda

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4. Location Services
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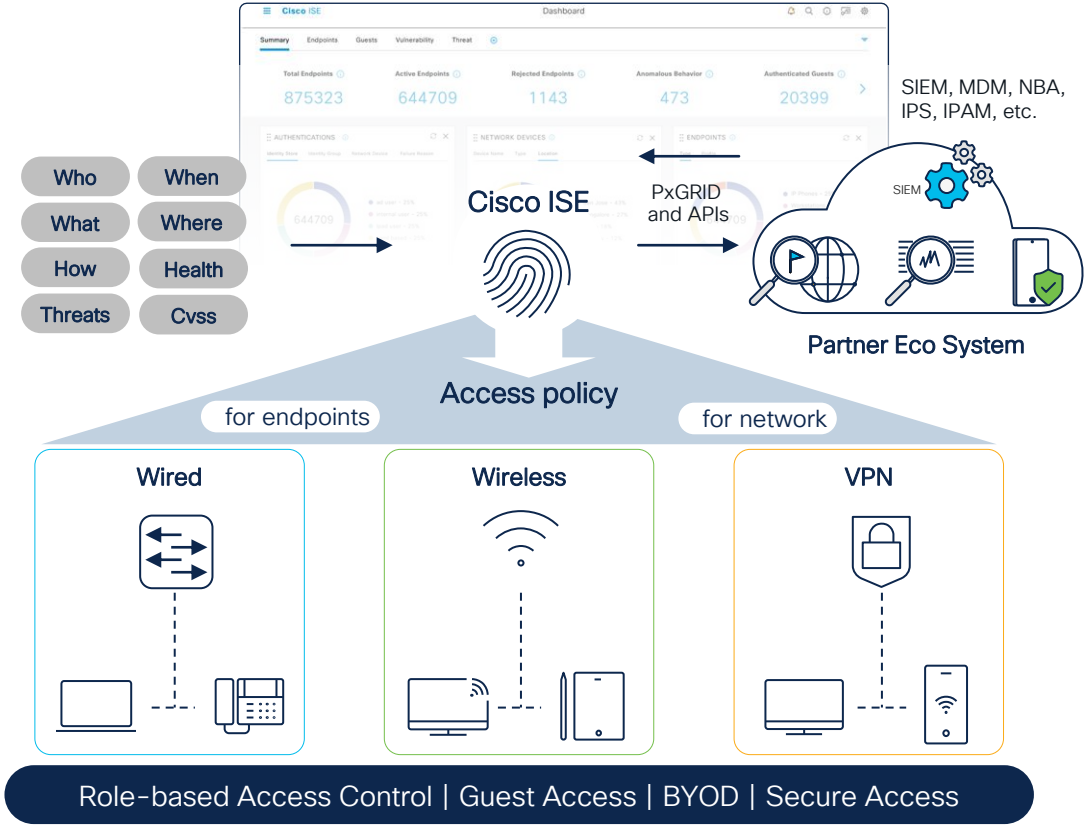
Cisco Identity Services Engine (ISE)

Cisco Identity Services Engine (ISE) is an industry leading, Network Access Control and Policy Enforcement platform, that lets you:

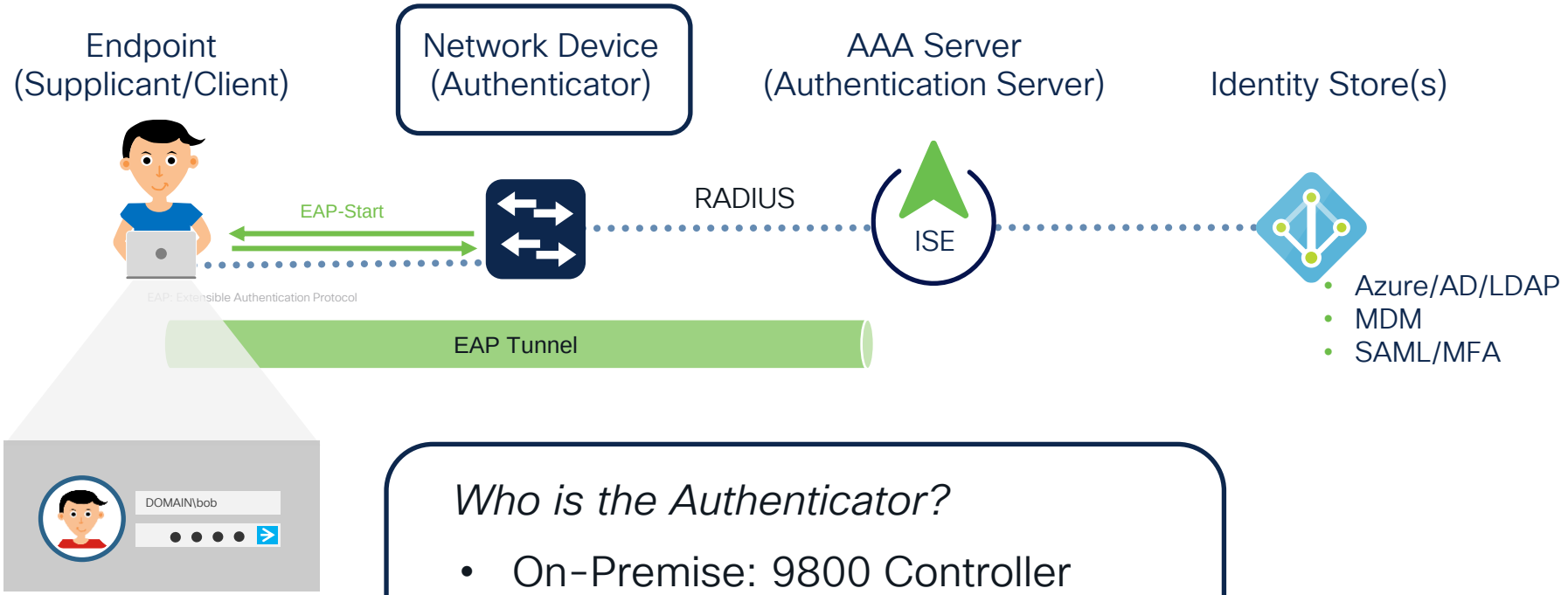
See
Users, endpoints and applications

Secure
By controlling network access and segmentation

Share
Context with partners for enhanced operations



IEEE 802.1X Fundamentals



Who is the Authenticator?

- On-Premise: 9800 Controller
- FlexConnect: Access Point
- Meraki Dashboard: Access Point

ISE is the Centralized Policy manager for Access Control & Micro-Segmentation

ISE: Common Policy Engine across Network Domains!

Active Probes: DHCP | DNS | HTTP | RADIUS | NMAP | SNMP | AD

Device Sensor: CDP| LLDP | DHCP | HTTP | H323 | SIP | MDNS

Wi-Fi Analytics: Firmware, HW_Model, Manufacturer, OS_Version, Vendor OUI

pxGrid: CyberVision (for Industrial endpoints)

ISE gathers context from network devices and endpoints

pxGrid

ISE

...and builds database of endpoints with their attributes

Device Type	Camera	IP-Phone	Laptop	Laptop
Manufacturer	Arlo	Cisco	Apple	Lenovo
Mode	Pro Wireless Cam	7980	MacBook Pro	Thinkpad 540
OS	Linux	IOS	macOS 13.0.1	Windows Enterprise

ISE classifies this data into Endpoint Profile

Meraki connector

INTEGRATIONS

Catalyst Center

- Group-based policy
- Group-based policy analytics
- SDA Fabric Networks (LISP/EVPN)
- AI Endpoint Analytics

COMMON

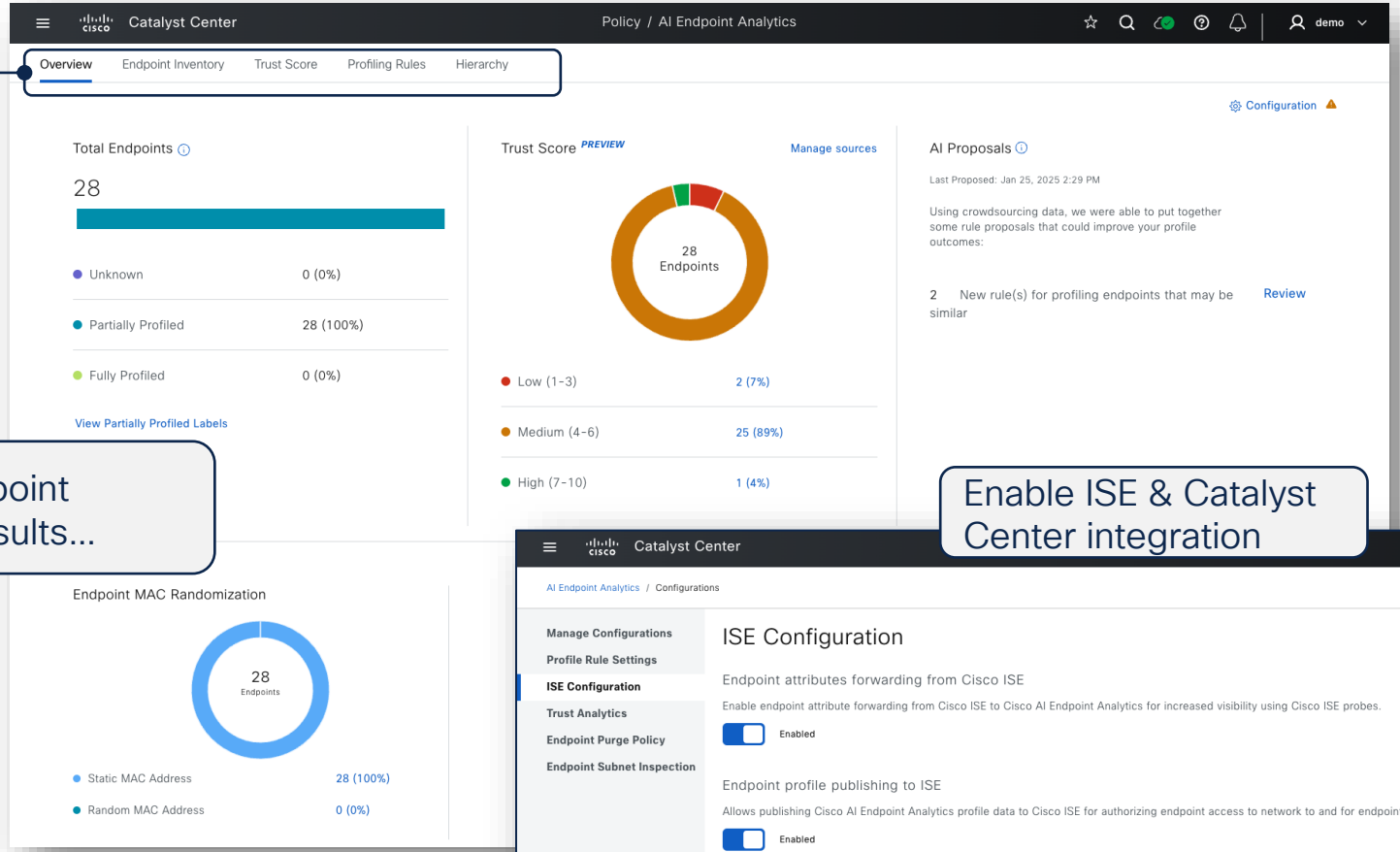
- AAA (Wired/Wireless)
- BYOD (Wireless)
- Guest Access (Wired/Wireless)
- Access Control (Wired/Wireless)
- Device Administration
- Context Exchange
- User defined network
- IoT Onboarding (Wired/Wireless)

Meraki Dashboard

- Group-based policy
- Adaptive Policy
- Meraki Dashboard policy scale and flexibility upgrade

ISE is a COMMON Policy Engine providing visibility and control across your network domains

Catalyst Center > Policy > AI Endpoint Analytics



View AI Endpoint Analytics Results...

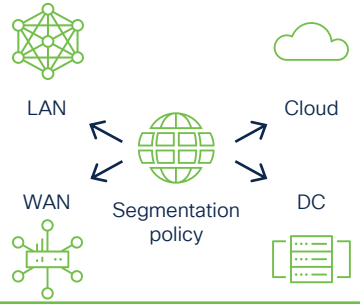
Enable ISE & Catalyst Center integration

Cisco Differentiation to Build robust network

Visibility & Endpoint Identity

Advanced Profiling **across Catalyst Center, Meraki & ISE** for accurate endpoint classification

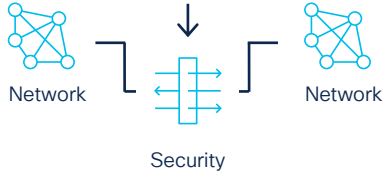
Wi-Fi Analytics: Catalyst 9800 share endpoint specific attributes to ISE, enabling for fast, accurate, and simple profiling of **Samsung**, **Apple**, and **Intel** devices



Segmentation & Policy Validation

End-end segmentation with **Common Policy**

Sharing context & KPI with Splunk for threat validation



Threat Containment

Policy-driven steering of high-risk traffic within fabric to Cisco firewalls for stateful inspection

Closed-loop Response with XDR for Threat Containment

Agenda

1. Wi-Fi 7 & APs
2. Platform Choices
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6. Built in IoT

No single technology can meet all needs

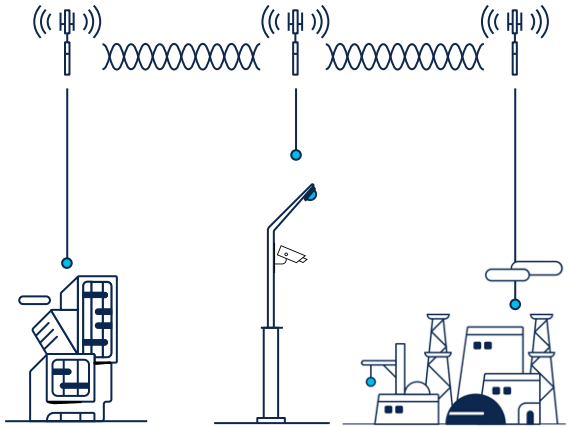
Cellular (5G)	Cisco URWB	Wi-Fi
Broad geographic coverage	Zero loss – sub ms latency and seamless roaming	Applications focused on capacity, client density, mobility, “guest” access, BYOD, stationary machinery
Mission Critical Applications		
 Tablets	 Cranes	 Stationary machines
 Robots	 AGVs	 Endpoints for workforce and guests
 Tow motor	 Forklifts	

5G, URWB and Wi-Fi are complementary technologies

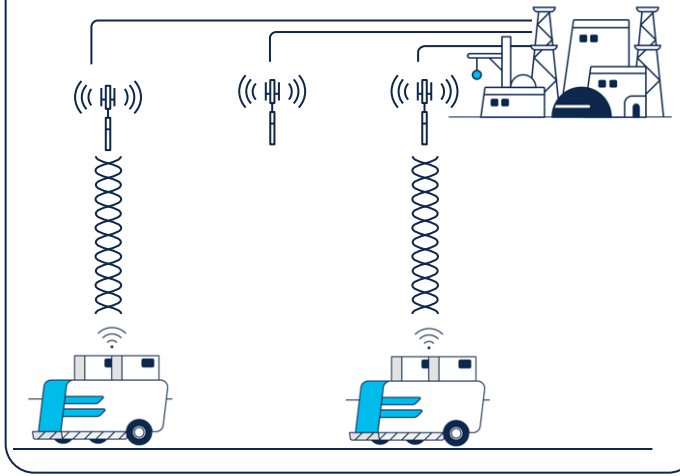
What is Cisco Ultra-Reliable Wireless Backhaul?

Reliable fiber-like wireless connectivity, anywhere

Connectivity where fiber isn't available or is too costly



Connectivity for moving assets



- Ultra-reliable
- Ultra-low latency (<10 ms)
- Zero loss Seamless handoffs
- Unlicensed spectrum

Proven · Deploys like Wi-Fi · Full control of your network · Unlicensed spectrum

Examples of reliable wireless use cases

Cisco Ultra-Reliable Wireless Backhaul Use Cases

Physical security

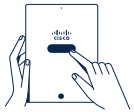
Video/VoIP for emergency stations and security cameras

Theme parks

Dark rides, Wi-Fi

Rail and mass transit

Communications-Based Train Control (CBTC), onboard Wi-Fi, CCTV, VoIP, intercar, femtocells



Campus and education

CCTV, monitoring, security alerts, Wi-Fi backhaul

Manufacturing

Enhanced Autonomous Mobile Robot (AMR) and AGV connectivity for factory floors

Ports and terminals

Terminal Operating System (TOS) and automation to Rubber-Tired Gantry (RTG), Ship-To-Shore (STS), AGV, and tractors

Digital divide

Bridge the gap with unconnected areas

Airports

Vehicle control and dispatch, deicing, CCTV, VoIP

Mining

Fleet Management System (FMS), Autonomous Haulage System (AHS), Teleremote, Video surveillance

Warehousing and logistics

Wireless communications for AGV and Automated Storage and Retrieval (AS/RS) Systems

Power and water utilities

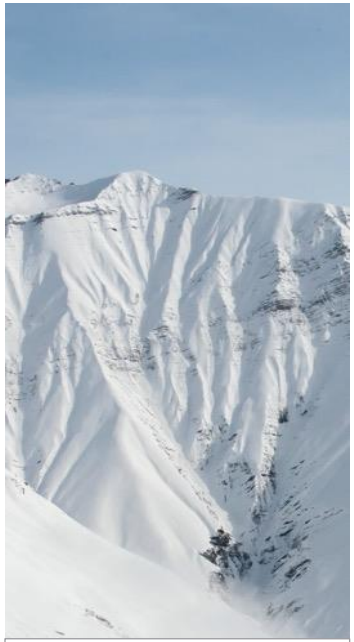
Sensor telemetry, remote monitoring

Oil and gas

Vehicle connectivity, pipeline telemetry, CCTV

Cisco IoT Access Points & Solution

Your network goes wherever you need it



- 50C

+75C

Shock / Vibration

Water

Dust

Industrial certifications (e.g. EN50155)

Industrial protocols

Outdoor and industrial wireless access points
Wi-Fi 6/6E and URWB

Catalyst IW9167E Access Point

Tri-radio, 4x4
External antenna
IP67, EN50155
Modes: URWB, WGB and Wi-Fi 6/6E

Wi-Fi
URWB
WGB

Catalyst IW9167I Access Point

Tri-radio, 4x4
Internal omni-directional antenna
IP67
Wi-Fi 6/6E

Wi-Fi

Catalyst IW9167E-HZ Access Point

Tri-radio, 4x4
External antenna
IP67, EN50155, Class I Division 2
Modes: URWB, WGB and Wi-Fi 6/6E

Wi-Fi
URWB
WGB

Catalyst IW9165E Wireless Client and Access Point

Dual-radio, 2x2
External antenna
DIN rail compact form factor, IP30, EN50155
Modes: URWB, WGB and Wi-Fi 6/6E

Wi-Fi
URWB
WGB

Catalyst IW9167E-STA/STA2 Access Point

Tri-radio, 4x4
Built-in directional panel antenna
STA: 75° wide beam, STA2: 35° narrow beam
IP67
Modes: Wi-Fi 6/6E

Wi-Fi

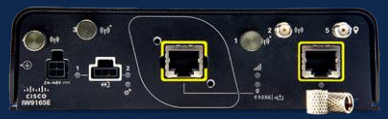
Catalyst IW9165D Access Point

Dual-radio, 2x2
External antenna
IP67
Modes: URWB and Wi-Fi 6/6E

Wi-Fi
URWB

IW9165E Access Point & Wireless Client (WGB)

Wi-Fi
URWB
WGB



Catalyst IW9165E

Your wireless network, your choice
Wi-Fi 6/6E, Cisco URWB, Workgroup Bridge (WGB)

Cisco's first dedicated wireless client
Compact DIN rail form factor for easy integration into moving assets, flexible mount position

Industrial certifications & industrial protocol support
Rolling stock, EN50155

Dual-radio
5 GHz, 5/6 GHz

2x2 MIMO
2 spatial streams

Multigigabit
RJ45 or SFP+

Heavy-duty design
IP67, -40 to +70C
EN50155
Optional M12 adapter

GNSS, BLE, GPIO
IoT radio, scanning radio

PoE+, UPOE or DC powered

AGVs, forklifts, tractors, trucks, cranes and other moving assets in manufacturing, warehouses, ports, rail, roadways

Operate IoT Access Points with your Enterprise Network Stack

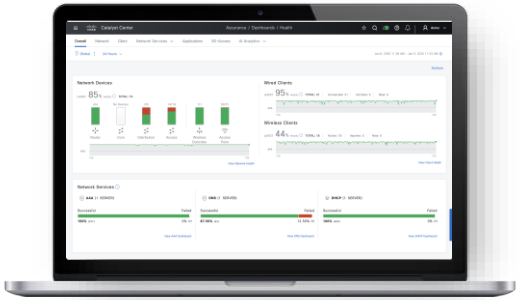
Wi-Fi mode

Catalyst IW9167 Series

Catalyst IW9165 Series

Wi-Fi mode

Cisco Catalyst Center



Catalyst 9800 Series Wireless Controllers

Optimize resources, reduce spending, and enhance your organization's digital agility with a powerful management system that uses AI to connect, secure, and automate network operations.

Get started with Cisco secure Wi-Fi 7 and Spaces today!

Wondering if we can go deeper? Yes, we can!

Selected intermediate Wireless Sessions per topic during this Cisco Live

Wi-Fi 7 & APs

Tuesday, February 11 | 8:00 a.m.
BRKEWN-2107
Cut the Cord: Design Principles to Deliver a Wireless-First Enterprise

Tuesday, February 11 | 2:30 p.m.
BRKEWN-2025
Wi-Fi 7 is Here - Are you Ready?

Platform Choices

Monday, February 10 | 4:15 p.m.
BRKEWN-2035
Design your Enterprise Wireless Network with Cisco Meraki

Tuesday, February 11 | 1:00 p.m.
BRKEWN-2094
Successfully Configuring Cisco Catalyst 9800 Series Wireless on Your First Shot

Tuesday, February 11 | 4:30 p.m.
BRKEWN-2339
Catalyst 9800 Configuration Best Practices

Simplified Operation

Monday, February 10 | 4:00 p.m.
BRKOPS-2402
Automate the Deployment of a Wireless Network with the Help of Cisco Catalyst Center

Wednesday, February 12 | 5:15 p.m.
BRKEWN-2039
AI Wireless Assurance - when AI meets Cisco Meraki Wireless

Thursday, February 13 | 1:00 p.m.
BRKEWN-2667
Cisco Wireless Supercharged by Catalyst Center: The Ultimate Guide

Location Services

Wednesday, February 12 | 3:00 p.m.
BRKEWN-2718
4 Steps to Unlock Location Based Intelligence from your Wi-Fi Network with Cisco Spaces

Secure!

Thursday, February 13 | 8:45 a.m.
BRKEWN-2104
Understanding Wireless Security and the Implications for Secure Wireless Network Design

Thursday, February 13 | 5:15 p.m.
BRKEWN-2325
Secure Your Cisco Wireless Network with Identity Services Engine (ISE)

IoT

Tuesday, February 11 | 12:00 p.m.
BRKIOT-2365
Unified Wireless for Industries - from WIFI to Private 5G and Beyond

Thursday, February 13 | 10:30 a.m.
BRKIOT-2555
Industrial Wireless for Manufacturing - New Solution

Some session may be full or offer additional delivery times. Make sure to verify in the Cisco Live App and register!

Fill Out Your Session Surveys

Participants who fill out a minimum of 4 session surveys and the overall event survey will get a unique Cisco Live t-shirt.

(from 11:30 on Thursday, while supplies last)

All surveys can be taken in the Cisco Events mobile app or by logging in to the Session Catalog and clicking the ‘Participant Dashboard’

Content Catalog

Continue your education

- Visit Wi-Fi 7 @ the Cisco Showcase in the World of Solutions (Hall 1)
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at ciscolive.com/on-demand. Sessions from this event will be available **from March 3**.

Contact me at: **mkostede@cisco.com**


cisco
Thank you
cisco Live!

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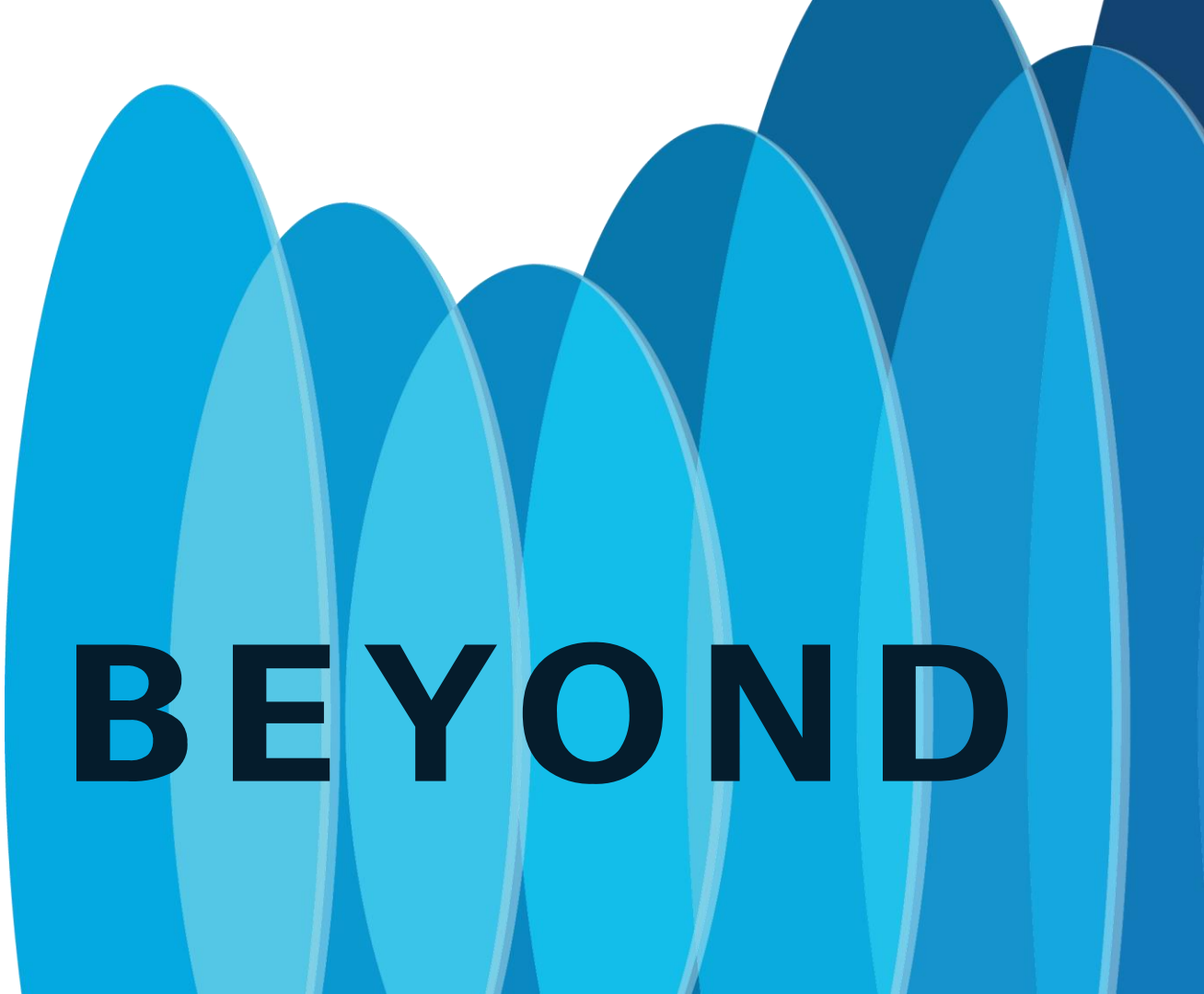

GO BEYOND