

# Co přináší Cisco Wi-Fi 7?

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4.2.2025

# Agenda

## 1. Hlavní témata v oblasti Wi-Fi

## 2. Nasazení Wi-Fi 7

- Aspekty nasazení Wi-Fi 7
- První připojení Wi-Fi 7 AP do wireless infrastruktury

## 3. Cisco Wi-Fi 7 řešení a Wi-Fi portfolio

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

# 6 GHz is the biggest Wi-Fi spectrum expansion ever



Band Channels Bandwidth

2.4 GHz

3  
1

20 MHz  
40 MHz



60 MHz of spectrum and  
3x 20-MHz channels

2.4 and 5GHz = **22x** 20MHz Channel

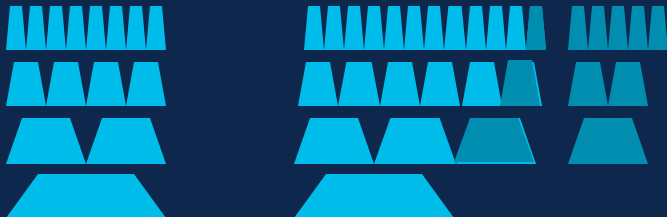


6GHz = **24x** 20MHz Channel

5 GHz

25  
12  
6  
2

20 MHz  
40 MHz  
80 MHz  
160 MHz



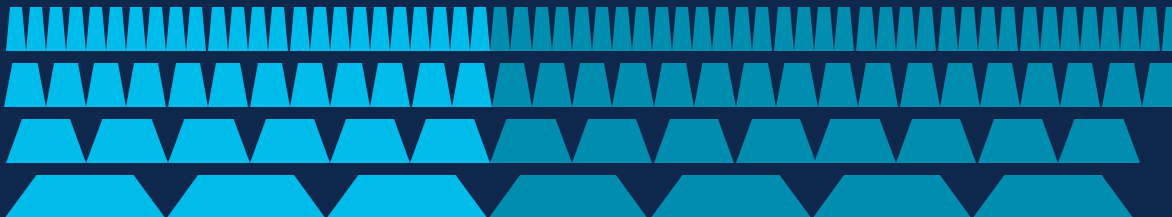
555 MHz of spectrum and  
25x 20-MHz channels in US

455 MHz of spectrum and  
19x 20-MHz channels in EU

6 GHz

59  
29  
14  
7

20 MHz  
40 MHz  
80 MHz  
160 MHz

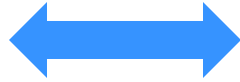


1200 MHz of  
spectrum and  
59x 20-MHz  
channels in US

500 MHz of  
spectrum and  
24x20-MHz channel  
in EU

# What is Wi-Fi 7 (and a bit of 11be)

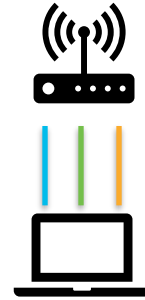
*TechClub odkaz  
(23.04.2024):  
Vše, co potřebujete  
vědět o Wi-Fi*



320 MHz in 6 GHz



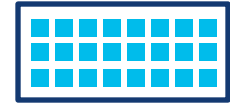
4K QAM



MLO



Enhanced Security



Compressed Block Ack  
(512 MPDUs)



Multi-RU



Preamble puncturing

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



Triggered UL Access Optimization



EPSC

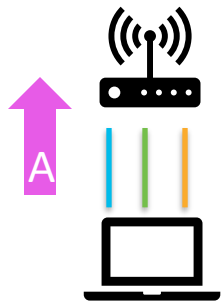
*Note: Wi-Fi 6E explicitly includes 6 GHz, but **Wi-Fi 7 does NOT require 6 GHz!***

# The many “modes” of MLO

...because clients have different hardware capabilities

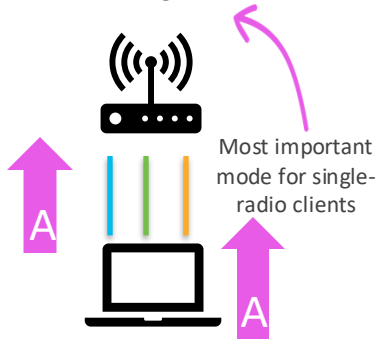
## Single Radio

### MLSR



Only one link operational at a given time

### EMLSR



MLSR plus additional capability to listen to two links.

#### Acronyms:

**MLMR** – Multi-link Multi Radio

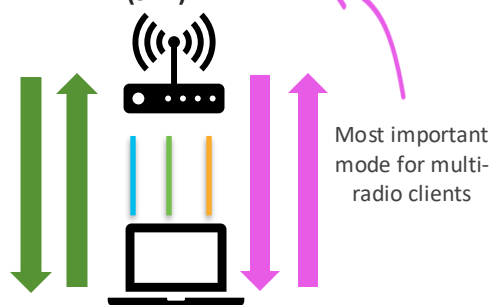
**MLSR** – Multi-link Single Radio

**EMLSR** – Enhanced Multi-link Single Radio

## Multi Radio

### MLMR

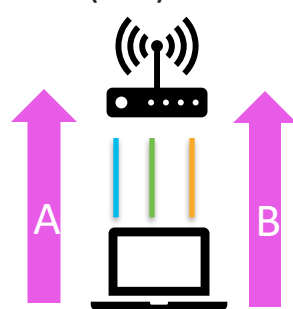
Simultaneous TX + RX (STR)



Each link operating independently for Tx and Rx

### MLMR

Non-Simultaneous Tx+Rx (nSTR)



Tx or Rx at the same time on different links  
(Not included in Wi-Fi 7 Certification)

# Aspekty nasazení Wi-Fi 7

# Cisco Wireless CW9178I/9176I/9176D

## Mechanical Design

Brand New Design



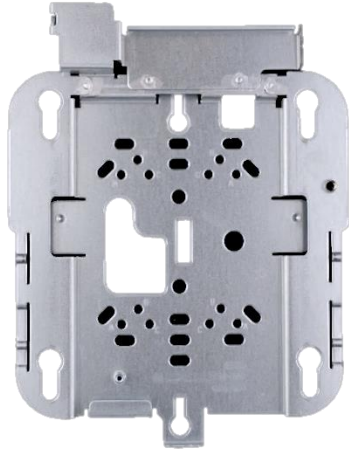
**Compatible with Standard Mounts:**  
AIR-AP-BRACKET-1 & AIR-AP-BRACKET-2

Enlarged Recessed Area



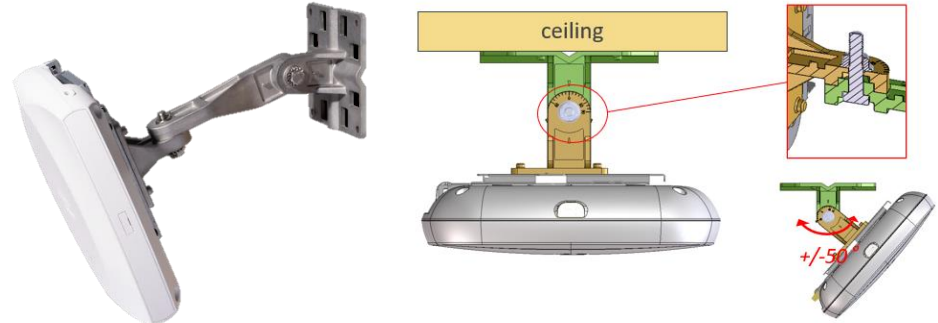
**Improved Cabling Experience:**  
Larger Recessed Area

# Cisco Wireless CW9176D1 Mounting brackets



## AIR-AP-BRACKET-2

The **default bracket shipped** with the 9166D designed to adapt to electrical boxes ideal for ceiling or wall mounting. Adapts to Articulating Arm.



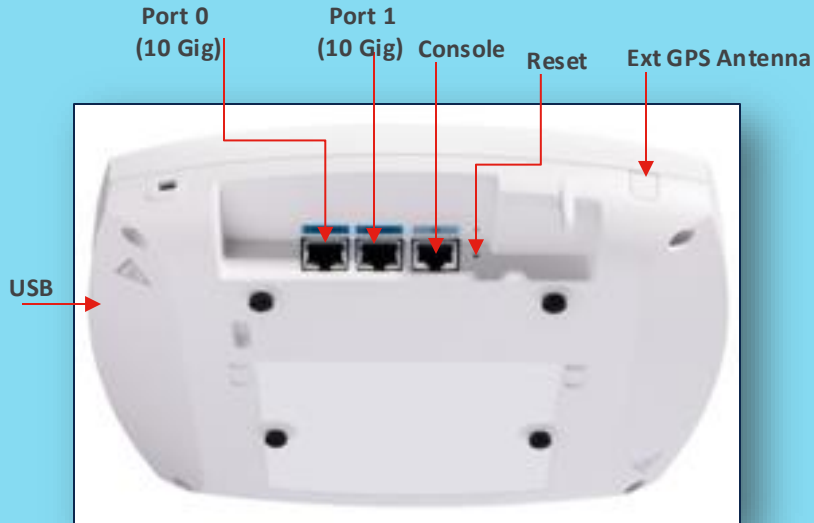
## Articulating Arm (CW-MNT-ART2-00)

**Optional bracket kit that attaches to AIR-AP-Bracket-2** allowing the AP to be articulated to cover many different mounting positions (left, right, up, down) etc. Recommended for the most flexibility in aiming the radio signal.

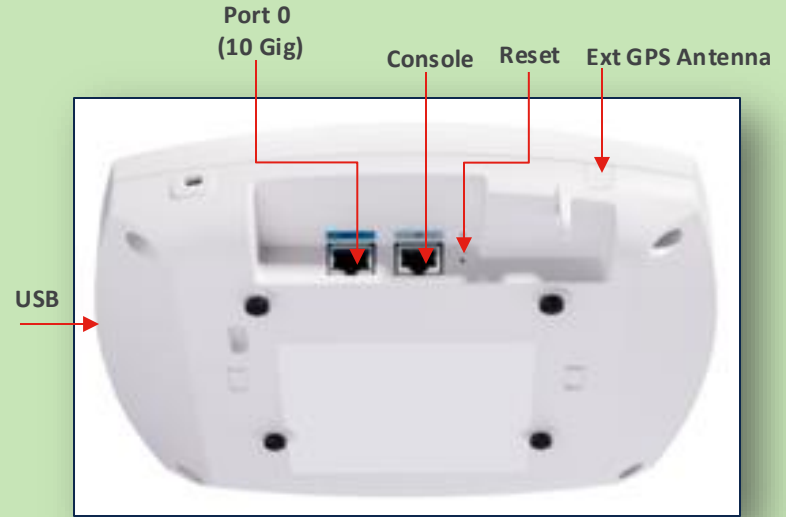


# Cisco Wireless CW9178I/CW9176I/D Ports

## CW9178I



## CW9176I/D



# Hardware and Software Matrix for CW917x APs

## Supported Controller Platforms:

- Cisco Catalyst 9800-L
- Cisco Catalyst 9800-40
- Cisco Catalyst 9800-80
- Cisco Catalyst CW9800M
- Cisco Catalyst CW9800H1
- Cisco Catalyst CW9800H2
- Cisco Catalyst C9800-CL

## Software Version:

IOS-XE : 17.15.2 or later

Meraki : R31.2 or later

Catalyst Center: 2.3.7.6\*

**Catalyst Center 2.3.7.7**

Recommended Release as of  
**Dec 18, 2024**

# Deploying and migrating to Wi-Fi 7

## Recommendations, tips, and tricks

### Power considerations

**Recommendation:**  
802.3bt (Cisco UPOE)  
is the suggested  
power input for full operation of AP

802.3at (PoE+) and 802.3af (PoE) are  
also supported by the  
CW9178I/CW9176I&D

### Security requirements

**Mandatory:**  
WPA3 is mandatory for 11be rates and  
MLO.

WPA3 was not required for prior Wi-Fi generations; hence, it must be top of mind.

### Multigigabit switching

**Recommendation:**  
Use a Multigigabit switch with 10G  
Capability.

Better user experiences with speeds  
beyond 1 Gbps. Cat 6/6A cabling  
recommended,

### Wireless coverage

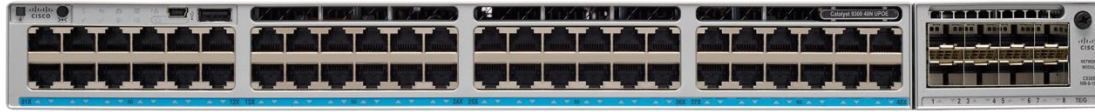
**Recommendation:**  
Ensure uniform cell size for 5 and 6  
GHz cells. 2.4 & 5 GHz does not need a  
new site survey

Review the current RF coverage of 5  
GHz network to achieve similar  
coverage for 6 GHz network.

**Review Global Use AP Functionality; especially for WLC Management Mode Deployments**

# Switching and Power Considerations

More advanced Wi-Fi → More processing → More Power



- 1 Enterprise grade, tri-band, tri-radio, Wi-Fi 7 4x4 APs will require more than 30W (peak) for all on features operation.
- 2 Aggregate AP throughput over 1G is a reality
- 3 Note: 802.3bt does not mean 60W(!). 30W 802.3bt is a thing(!!)

New deployments and refreshes should plan for >30W and mGig

# Power Considerations

But first



802.3bt != More than 30W (!)



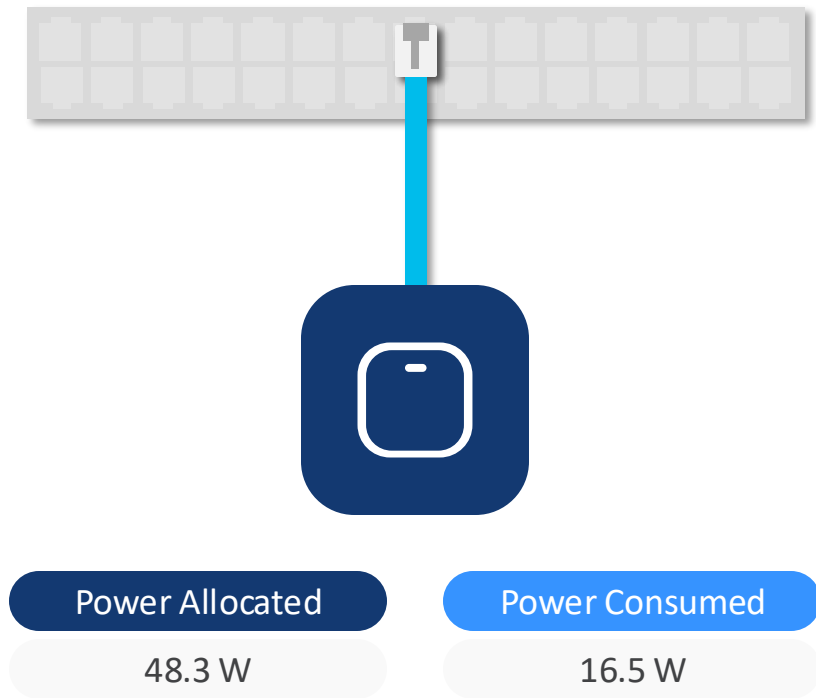
## Key Definitions

UPoE: Cisco speak for > 30W

802.3at: Maximum of 30W

802.3bt: Can do 30W and >30W

# AP Power Consumption



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

# CW9178I Power Consumption (dual port)



## Power Allocated

Port 0 54.4 W

Port 1 54.4 W

## Power Consumed

16.5 W

0.5 W

Both ports negotiate power and need to be considered for budget

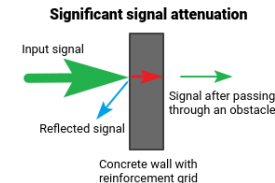
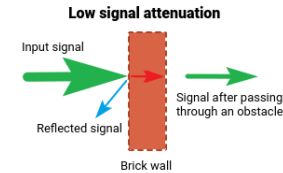
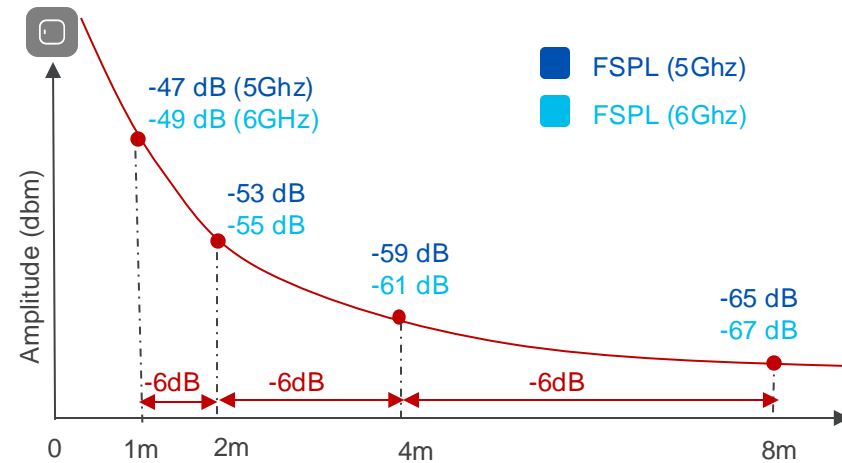
If no-LAG, Standby port consumes very little power

If LAG, both ports are active, and they both draw power

# Wireless coverage / 6 GHz RF Design

## What you need to consider?

- **Path Loss (FSPL)\*** - Path loss in the first meter is on average **2dB higher at 6GHz** vs. 5GHz. After that, the 6 dB rule applies: doubling the distance results in a 6 dB loss, regardless of the frequency
- **Cell Size** – At 6 GHz @ same power level cell is smaller vs. cell size at 5 GHz
- **Absorption/Reflectance** – 6 GHz will be attenuated more through wall or other surface
- **Noise floor** at 6 GHz is much lower than 5 GHz, at least for some time 😊
- **Coverage type**: Today 6GHz is indoor only



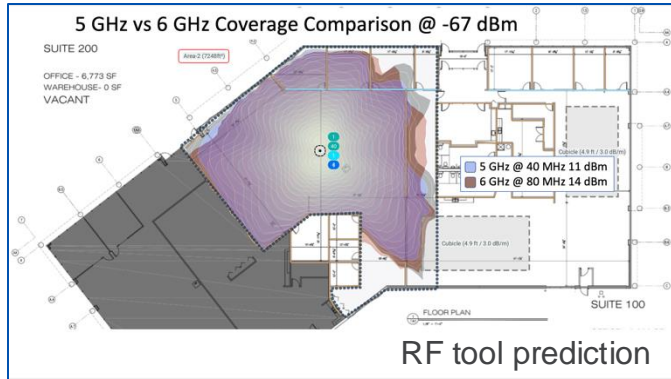
(\*) FSPL = Free Space Path Loss: [https://en.wikipedia.org/wiki/Free-space\\_path\\_loss](https://en.wikipedia.org/wiki/Free-space_path_loss)

<https://help.keenetic.com/hc/en-us/articles/213968869-Wi-Fi-signal-attenuation-coefficients-when-passing-through-different-materials>



# RF Design considerations

- AP antenna patterns at 6GHz are similar to 5GHz
- **AP coverage** between 5GHz and 6GHz will be similar, especially in open spaces BUT it does require to compensate with **power > 3dB higher in 6GHz**



- 5GHz @40 MHz 11dbm
- 6GHz @80 MHz 14 dbm

- With brick walls, elevator and other environments, you would probably need to measure and add few APs

# Where are we then on 5 and 6 GHz assumptions?

Q1: Can a co-resident 6 GHz radio provide the same coverage as the 5 GHz cell while dramatically increasing performance?

**A1: Yes!**

Q2: Can a one for one replacement of Wi-Fi 6/5 APs with Wi-Fi 6E APs be achieved?

**A2: Yes! / Assuming 140-190 m<sup>2</sup> of average AP density, carpeted office normal ceiling (3m)**

**NEW SITE SURVEY RECOMMENDED!!!**

**ALSO, REVALIDATE ALL WIRELESS REQUIREMENTS**

- Business (Purpose, Objectives, Stakeholders, ...)
- Technical (Covered Areas, Reg Domain limitations, ...)
- RF/Deployment Specifics (Coverage, SNR, Throughput, ...)

- 5 GHz network with RRM operating at power levels 3-4? >then equal 5 and 6 GHz coverage is possible with a one for one AP replacement in both ETSI and FCC. Assuming 80 MHz channel in FCC and 40 MHz channel in ETSI/UK
- If the power level is in 1-2, then you may need around 10 to 20% additional access points.

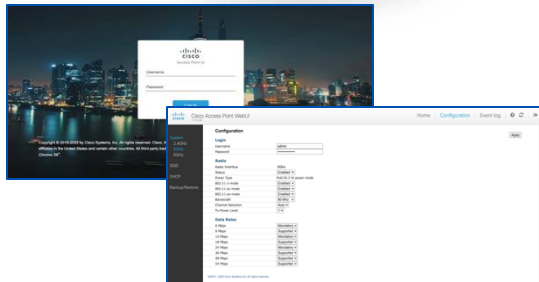
# Assess environmental RF coverage using the CW9178I & CW9176I/D site survey mode



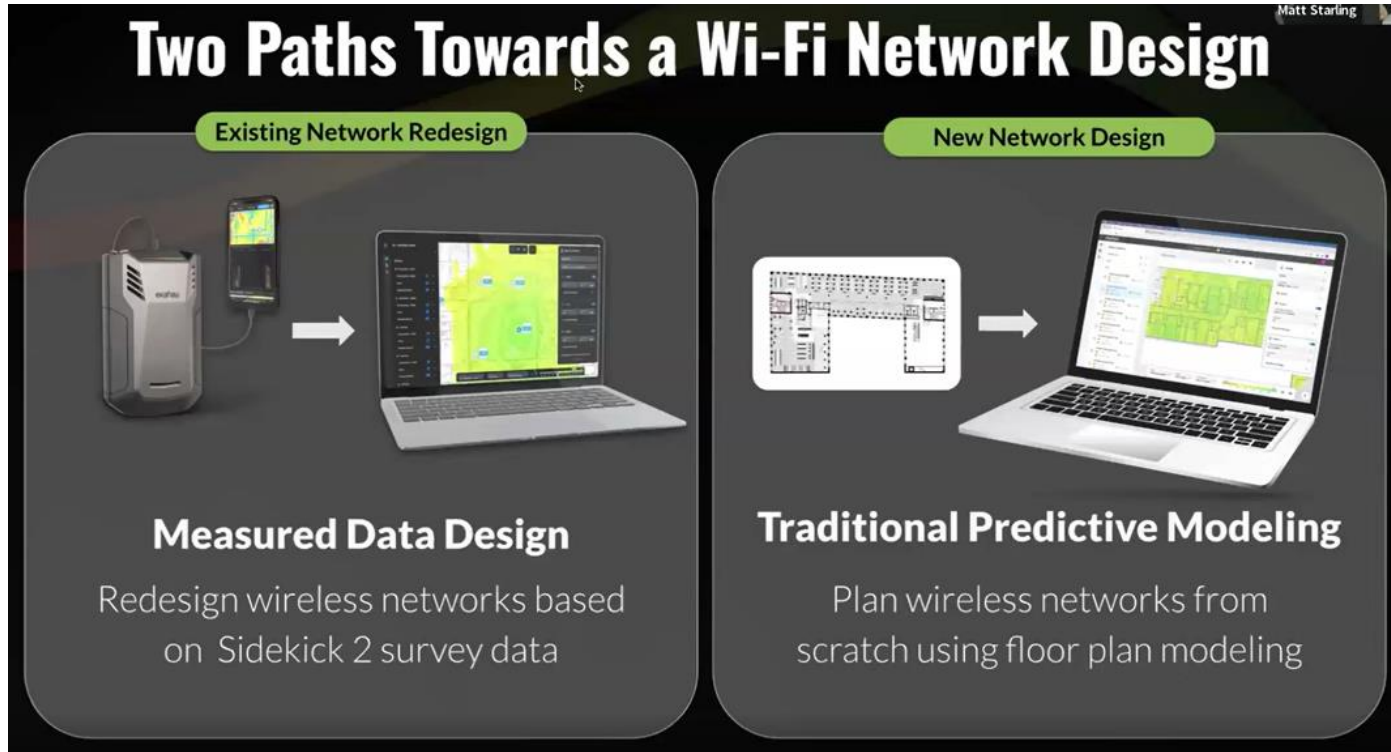
Puts AP in standalone mode and enables it to broadcast 2.4-, 5-, and 6-GHz SSIDs and have clients join via internal DHCP.

Supports WebUI access for easy configuration and viewing of various RF metrics for RF coverage and planning.

Supports configuration of channel number, channel width, Tx power, SSID, and data rates.



# Ekahau – Paths Towards Wi-Fi Network Design



*Source: Ekahau Webinar*

Upcoming

# Exploring Wi-Fi 7 with Special Guests from Cisco

📅 Starts in 31 days — Feb 20, 2025



Thursday, February 20, 2025 | 12:00 – 1:00 pm ET

## Exploring Wi-Fi 7 with Special Guests from Cisco

Get ready to unlock the full potential of Wi-Fi 7! Join us on February 20, 2025, as we bridge the gap between Wi-Fi 7's innovative capabilities

### Register for webinar

First Name \*

Jaroslav

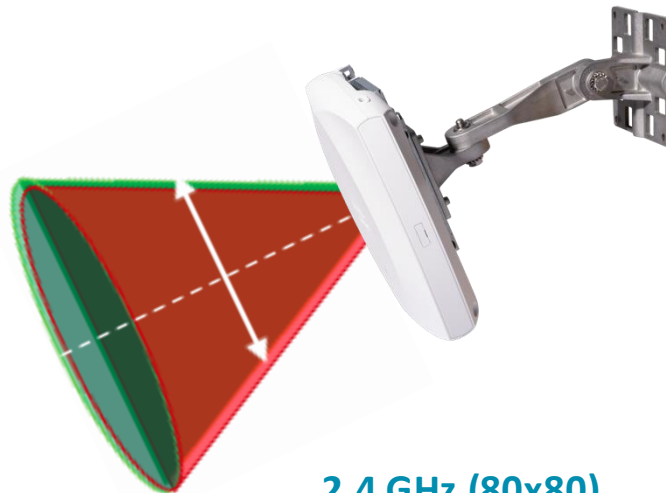
Last Name \*

Cizek

# Antenna differences between CW9176I and CW9176D1



**CW9176I** designed with an integrated omnidirectional antenna ceiling mount for a “360 degree” coverage pattern – ideal for offices, conventional buildings

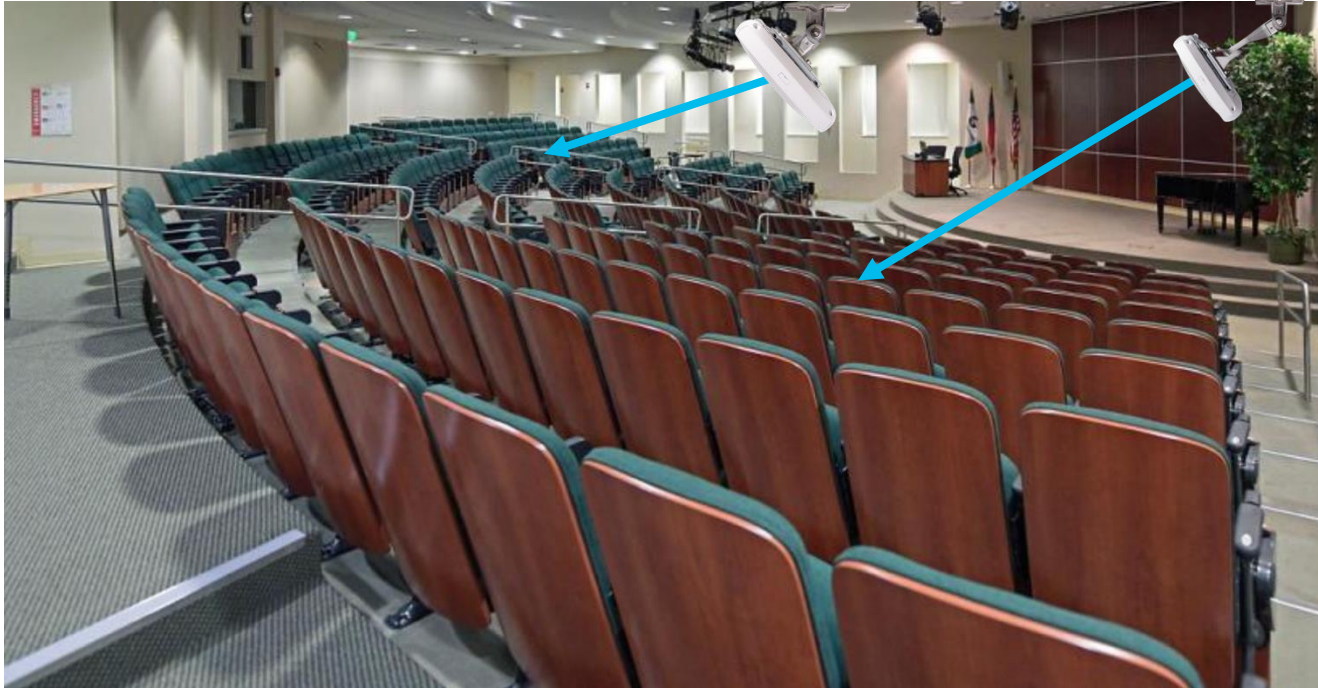


**2.4 GHz (80x80)**

**5 & 6 GHz (70x70)**

**CW9176D1** designed with an integrated directional antenna allowing the coverage pattern to favor the area the AP is facing - ideal for warehouse, auditoriums etc.

# CW9176D1 Use cases - Auditoriums (Focused connectivity/ High Density)



Focusing the direction of the signal improves range, increases signal strength and reduces retries improving overall performance

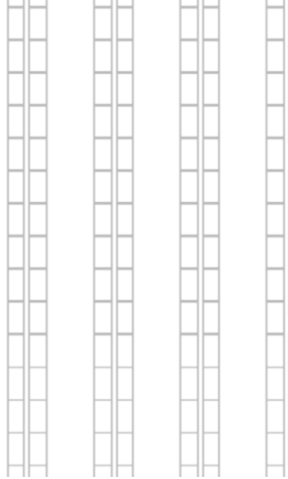
**While an Omni-Directional would work, in this fashion, RF connectivity is optimized as each AP is focused into a specific area**



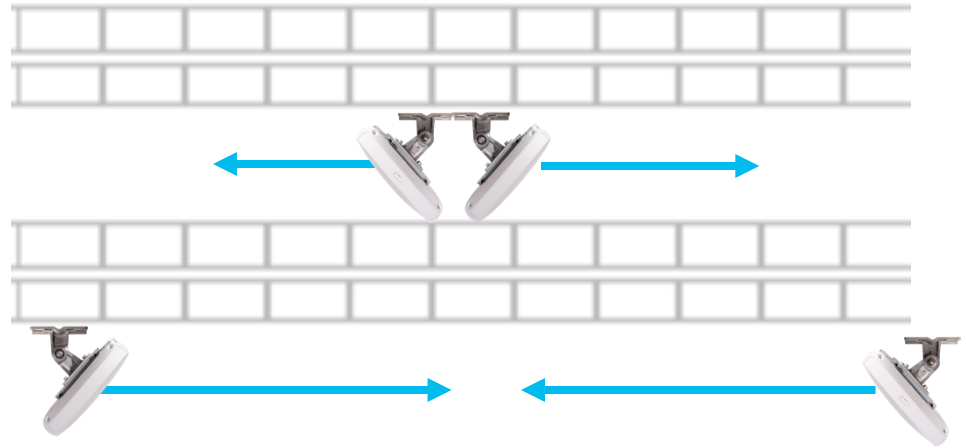
# CW9176D1 Use cases - Warehouse (High ceilings / long aisles)

## Warehousing challenges

- High Ceilings
- Long aisles
- Stock material changes (seasonal)
- AP (distance to client) & mounting



Back-to-Back units in center of aisle covering long aisles (Ability to adjust tilt)



Or perhaps at each end of the aisle shooting down the aisle

**Omni-directional pattern is problematic in these areas as AP should be directional and located high to avoid tow motors, changing stock material etc.**



# CW9176D1 Use cases – Healthcare (Long hallways)



Long hallways are oftentimes handled with Omni-directional Access Points such as this Cisco Access Point flush mounted to a wooden ceiling.

When it becomes problematic or cost prohibitive to install multiple Access Points, a directional antenna unit can be installed on each end of the hallway assuming there are no metal doors or obstructions in the path



CW9176D1

# Wi-Fi 7 Security

Wi-Fi 7 brings new AKM support for WPA3-SAE and new increased ciphers for OWE & SAE, WPA3 /OWE mandatory for EHT (11be MCS rates) & MLO

Cipher: GCMP 256 – Better Encryption & Speed; AKM: Better security

Legacy	Wi-Fi 6	Wi-Fi 6E (6 GHz)	Wi-Fi 7
Open	Open (OWE support required)	OWE (AKM: 18) (Cipher: CCMP 128)	OWE (AKM: 18) (Cipher: CCMP 128 or GCMP 256)
WPA1/WPA2/WPA3 Transition WPA3-Personal, PMF Optional	WPA2/WPA3 Transition/ WPA3-Personal, PMF Optional (WPA 2 - AKM – 2, 4 & 6) (WPA 3 – AKM – 8 & 9) (Cipher: CCMP 128 or AES)	WPA3-Personal, PMF Mandatory (AKM: 8 & 9) (Cipher: CCMP 128 or AES)	WPA3–Personal, PMF Mandatory (AKM: 24 & 25) (Cipher: CCMP128 or GCMP 256)
WPA1/WPA2/WPA3 Transition/ WPA3-dot1x (Enterprise), PMF Optional	WPA2/WPA3 Transition/ WPA3-dot1x (Enterprise), PMF Optional (AKM 1, 3 & 5, 11 & 12) (Cipher: AES, CCMP 128, GCMP128 GCMP256)	WPA3 Enterprise, PMF Mandatory (AKM: 3, 5, 11 & 12) (Cipher: CCMP128, GCMP 128 & GCMP 256)	WPA3 Enterprise, PMF Mandatory (AKM: 3, 5, 11 & 12) (Cipher: CCMP128, GCMP 128, GCMP 256)

Clients connecting to lower security, can connect to 2.4 & 5 GHz bands of Wi-Fi 7 AP, but restricted to 11ax or earlier. No 11be rates & MLO

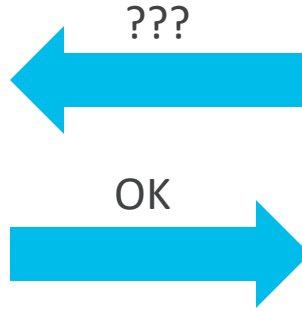
*Note: All devices since 2019 are required to support WPA3, regardless of generation*

*Note2: WPA3 is from 2018. FT/11r from 2008. Time to move on. All the latest OS on PC, Apple and Android support WPA3 and Enhanced Open.*

# Roaming



SAE-PSK (akm 8)

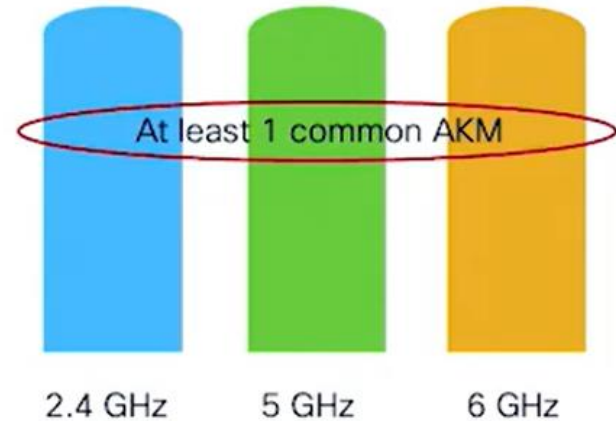


SAE-PSK (akm 8)

SAE-PSK-EXT (akm 24)

# Wi-Fi 7 - WPA3 (& 6GHz) WLAN Design Considerations

- Rule #1
  - To use 6 GHz, you must use WPA3 (OWE, SAE-PSK, 1x)
- Rule #2
  - For Wi-Fi 7/MLO – all link must use one common AKM
  - For SAE, this must be AKM 24 (SAE-EXT Key) – no WPA2-PSK. Possible roaming issue with AKM 24 -> AKM 8
- So, if you want Wi-Fi 7:
  - On the SSID: You must use WPA3!
  - You can mix in transition modes to bridge the gap
- Security requirements enforcement
  - Disconnect a client
  - Operating the AP in Wi-Fi6/6E mode



# Wi-Fi 7 - WPA3 (& 6GHz) WLAN Design Considerations

Most likely your current WLAN design would prevent it from being supported on 6GHz

## 6GHz SSID Requirements

- L2 Security: **WPA3** or **OWE**
- Any other L2 security method is not allowed – **no mixed mode possible**
- **Protected Management Frame (PMF)** enabled

## What options would you have?





1. Reconfigure the existing WLAN and move to WPA3 → one SSID for all radio policies (2.4/5/6 GHz) – **(Most unlikely ... or not?)**
2. **Redesign your SSIDs, adding specific SSID/WLAN with specific security settings. (Most Safe and Recommended)**
3. **Use single SSID WLAN Profile and enable WPA3 Transition Mode (Most Flexible and the only solution in some cases, but ...)**

# Real deployment may not be greenfield



# Current list of Wi-Fi7 clients

- Iphone 16
- Galaxy S24 Ultra
- Asus ROG phone 7
- Oneplus 11
- Pixel 8
- Playstation 5 Pro
- Sony Xperia 1
- Intel BE 200/202

Clients			
Windows	Android	iPhone/iOS	MacOS
			
<ul style="list-style-type: none"><li>• Only Windows 11</li><li>• MLO not (really) supported until 24H2 - released Oct 1<sup>st</sup> 2024(!)</li><li>• Predominantly Intel BE200 and QCA 7800 chips</li><li>• Update your drivers</li></ul>	<ul style="list-style-type: none"><li>• Bit of a mixed bag</li><li>• Samsung S24 is generally good, same with Pixel 8 and above</li></ul>	<ul style="list-style-type: none"><li>• iPhone 16 and 16 Pro</li></ul>	<ul style="list-style-type: none"><li>• If I knew anything I couldn't tell you (I don't)</li></ul>

Source: WLPC / Nicholas Swiatecki (Cisco)

# Windows

Network band (channel): 5 GHz (161), 6 GHz (133)  
Aggregated link speed (Receive/ 2161/1729 (Mbps)

“netsh show wlan interfaces” shows this as well

If you don't see two (or more) channels:

- Update windows to 24H2
- Update Driver
- Check security settings (AKM/Pairwise cipher)
- Check that your AP actually is doing MLO 🤔

Source: WLPC / Nicholas Swiatecki (Cisco)



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## Network & internet > Wi-Fi > NS-W7-HomeLab

### Network profile type

#### ☒ Public network (Recommended)

Your device is not discoverable on the network. Use this in most cases—when connected to a network at home, work, or in a public place.

#### ☐ Private network

Your device is discoverable on the network. Select this if you need file sharing or use apps that communicate over this network. You should people and devices on the network.

### Configure firewall and security settings

### Metered connection

Some apps might work differently to reduce data usage when you're connected to this network.

### Set a data limit to help control data usage on this network

### Random hardware addresses

Help protect your privacy by making it harder for people to track your device location when you connect to this network. The setting takes effect the next time you connect to this network.

IP assignment: Automatic (DHCP)

DNS server assignment: Automatic (DHCP)

SSID: NS-W7-HomeLab

Network name: Wi-Fi 7

Security type: WPA3: Personal

Manufacturer: Intel Corporation

Description: Intel(R) Wi-Fi 7 BE200 320MHz

Driver version: 23.80.0.7

Network band (channel): 5 GHz (161), 6 GHz (133)

Aggregated link speed (Receive/ Transmit): 2161/1729 (Mbps)

IPv6 address:

Link-local IPv6 address: fe80:9590:f800:a98b:ad63%11

IPv6 default gateway: fe80:bedb:9ff:fed1:ccb6%11

IPv6 DNS servers: 2620:119:53::53 (Unencrypted)

2620:119:35::35 (Unencrypted)

IPv4 address: 172.17.1.242

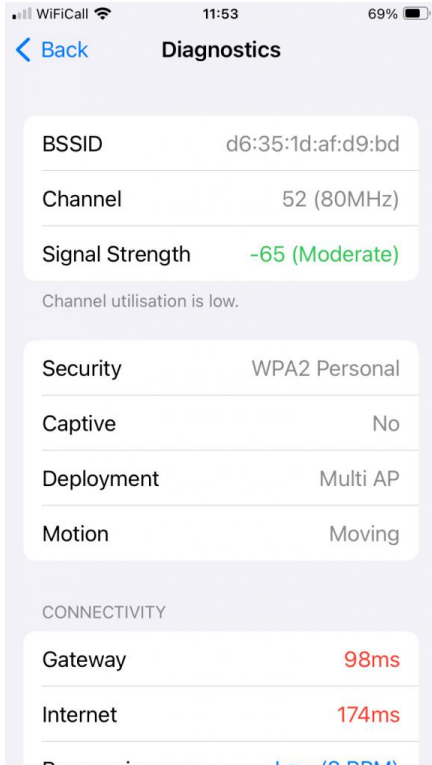
IPv4 DNS servers: 208.67.222.222 (Unencrypted)

208.67.220.220 (Unencrypted)

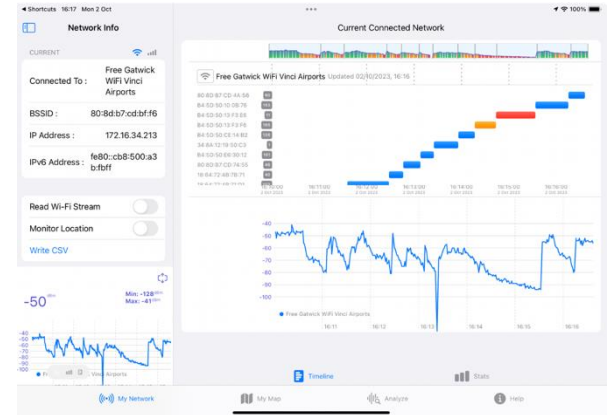
Physical address (MAC): 10-91-D1-06-0C-E8



# Apple Diagnostic Profile



[How to link](#)



[Noveris link](#)

# Samsung S24



## Connection information

Link status

L2 status

L3 status

NS-W7-HomeLab

c6:14:a2:fb:0b:51 [MLD]

Frequency

2412 6615 [Associated Links]

KVR

Neighbor Report: Enabled

BSS Transition: Enabled

11R: Disabled

Country code

AP: US

STA: US

Security type

WPA3 SAE

Generation

Wi-Fi 7

Multi-Link information

Link 0 [Associated] c4:14:a2:fb:0b:50 Freq=2412 (CH1)

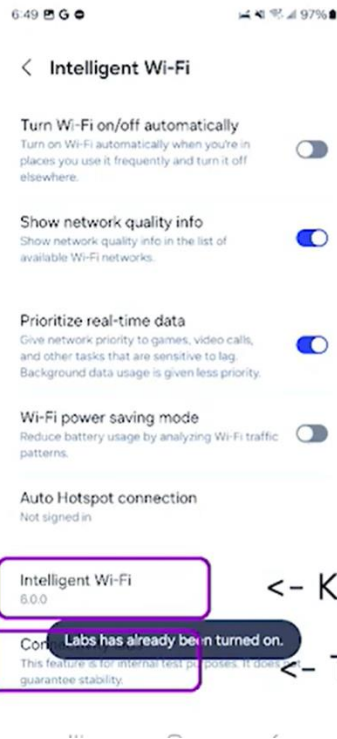
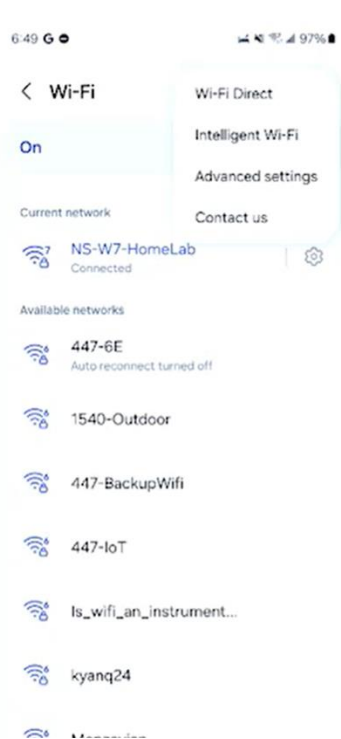
Link 1 [UnAssociated] c6:14:b2:fb:0b:50

Link 2 [UnAssociated] c6:14:82:fb:0b:50

Link 3 [Associated] c6:14:92:fb:0b:50 Freq=6615

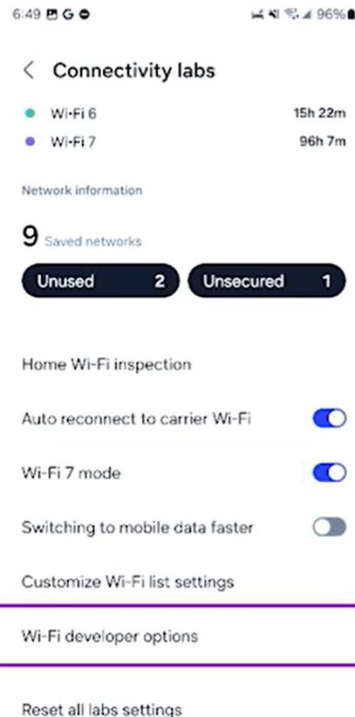
(CH133)

# Samsung – how to enable this



<- Keep tapping this (~7x times)

<- Then, this appears 🤖



Source: WLPC / Nicholas Swiatecki (Cisco)

# Clients and MLO – What we have observed

- Intel BE200: Single Radio, eMLSR
- QCA 7800: Multi radio/STR, and MLSR
- iPhone 16 Pro: Multi radio/STR, and MLSR
- Samsung s24: Multi radio/STR, and MLSR
- Pixel 9: Multi radio/STR and eMLSR



How was this observed? Want to go deeper?  
Shameless promotion  
"Inside Scoop on Wi-Fi 7 | Nicholas Swiatecki | WLPC Prague 2024"



# První připojení Wi-Fi 7 AP do wireless infrastruktury

# One Cisco Wireless Access Point

Global Use AP, Unified Product, Single SKU



Cisco Catalyst Management Mode  
C9800 & Catalyst Center Stack



Meraki **Management Mode**  
MR Dashboard Stack



Join WLC or Meraki stack on Day 0, based on Intent  
Management Mode Change from Day 1 to N

# Customer scenario 1: Catarina



Catarina is a “classic” Catalyst WLC customer, here is how she onboards Global Use APs.

1. Plug in APs.
2. APs detect that they are **not** claimed into a Meraki network or connected to the internet, and they then try to detect the presence of WLC (or CatC). If a compatible controller is found, They will reboot into WLC Mode, and join the WLC, using DHCP, DNS, Broadcast and PnP Mechanisms that exist today.
3. After joining WLC, AP determines which country it should operate in, through GPS/GNSS, Proximity based discovery or a manual way through Regulatory Activation file

# Customer scenario 2: Miles

Miles is a Meraki customer, here is how he onboards Global Use APs



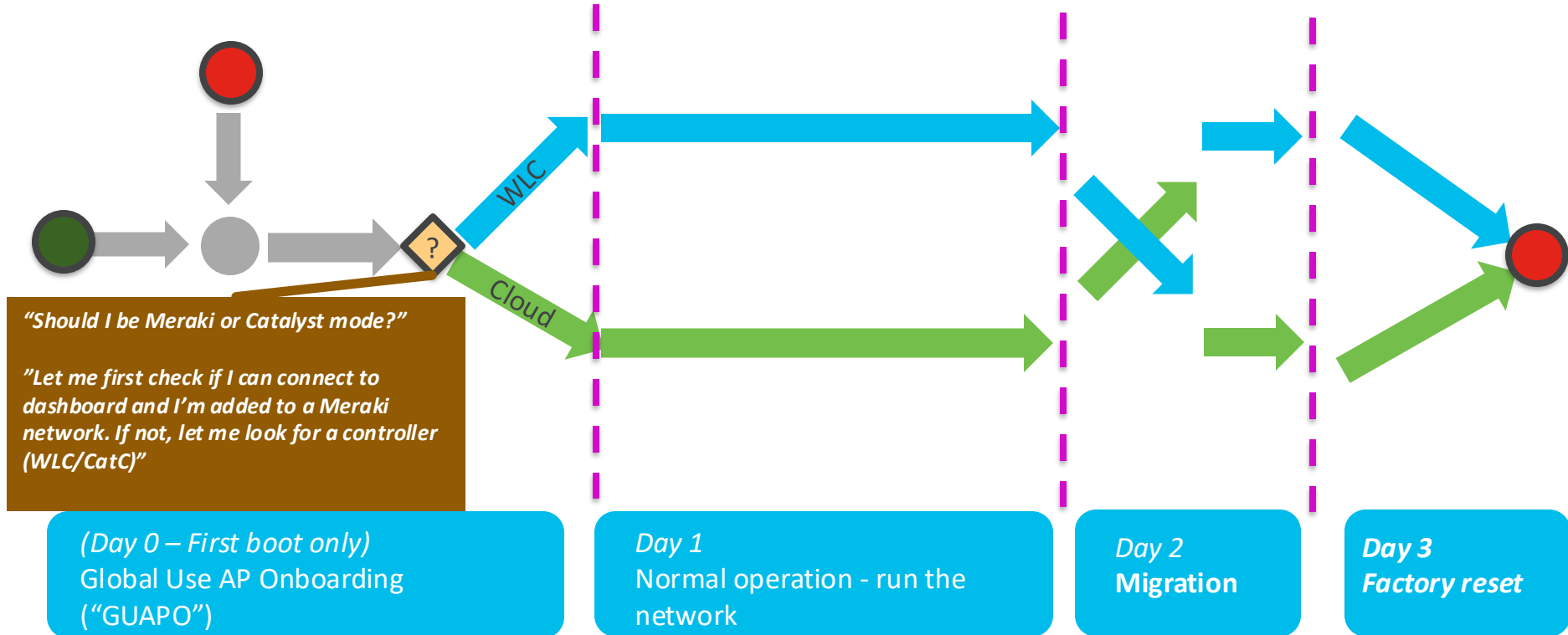
1. Claim AP via the Cloud ID in Dashboard
2. Plug in the AP, AP joins Meraki Dashboard
3. Done 🎉

In short: Nothing changes during onboarding for majority of Meraki Customers.

The only thing to pay attention to are deployments with both Meraki Mode APs and WLC or CatC in the same network



# Map of a Global Use AP's journey



# Fast Migration to Catalyst Mode using DHCPv4 Option 43 “F3”



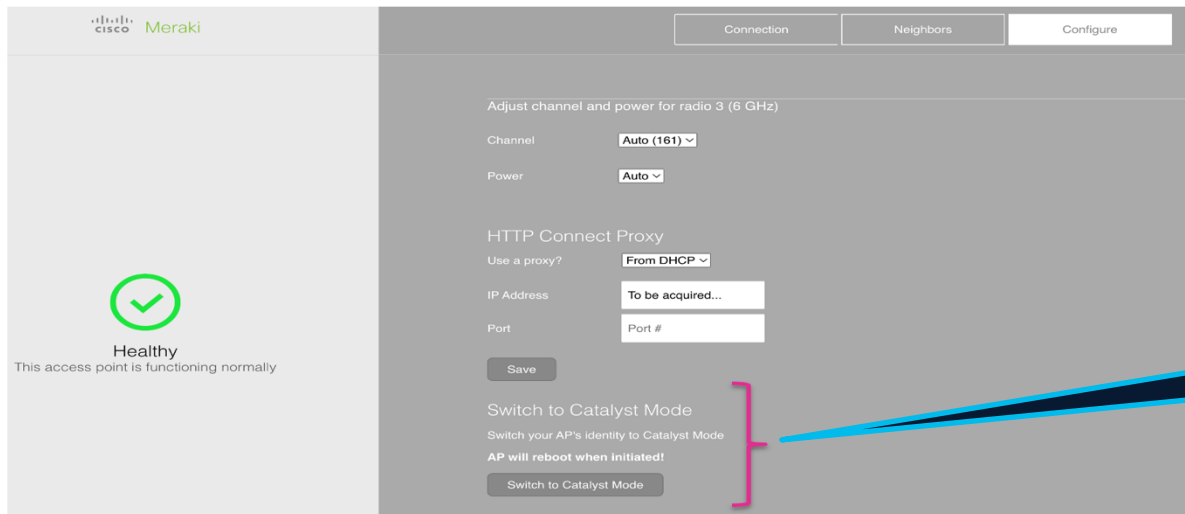
- Customers can use this **NEW** option to do “Fast” migration without delay
- Reachability checks using ONE of the below (both are not checked)
  - ICMP
  - CAPWAP Discovery

## DHCPv4 Option 43 – F3

- F3 <size> <IP array> Mode Value=<1/2>
  - Meraki: Mode=1
    - IP array is not used
  - Catalyst: Mode=2
    - At least one IP of the IP array must be ICMP reachable
- Example
  - **WLC IP address:** 200.1.0.100
  - ip dhcp pool vlan200
  - option 43 hex **F305c801006402**

# Local Status Page Migration to Catalyst

If device is not claimed then customer can trigger the migration to Catalyst from Local Status Page. To do that, Customer will have to open local status page (see [https://documentation.meraki.com/General\\_Administration/Tools\\_and\\_Troubleshooting/Using\\_the\\_Cisco\\_Meraki\\_Device\\_Local\\_Status\\_Page](https://documentation.meraki.com/General_Administration/Tools_and_Troubleshooting/Using_the_Cisco_Meraki_Device_Local_Status_Page)) and go to configure tab. Then, if migration is allowed customer will have to click on “Switch to Catalyst Mode” as in the screenshot below:

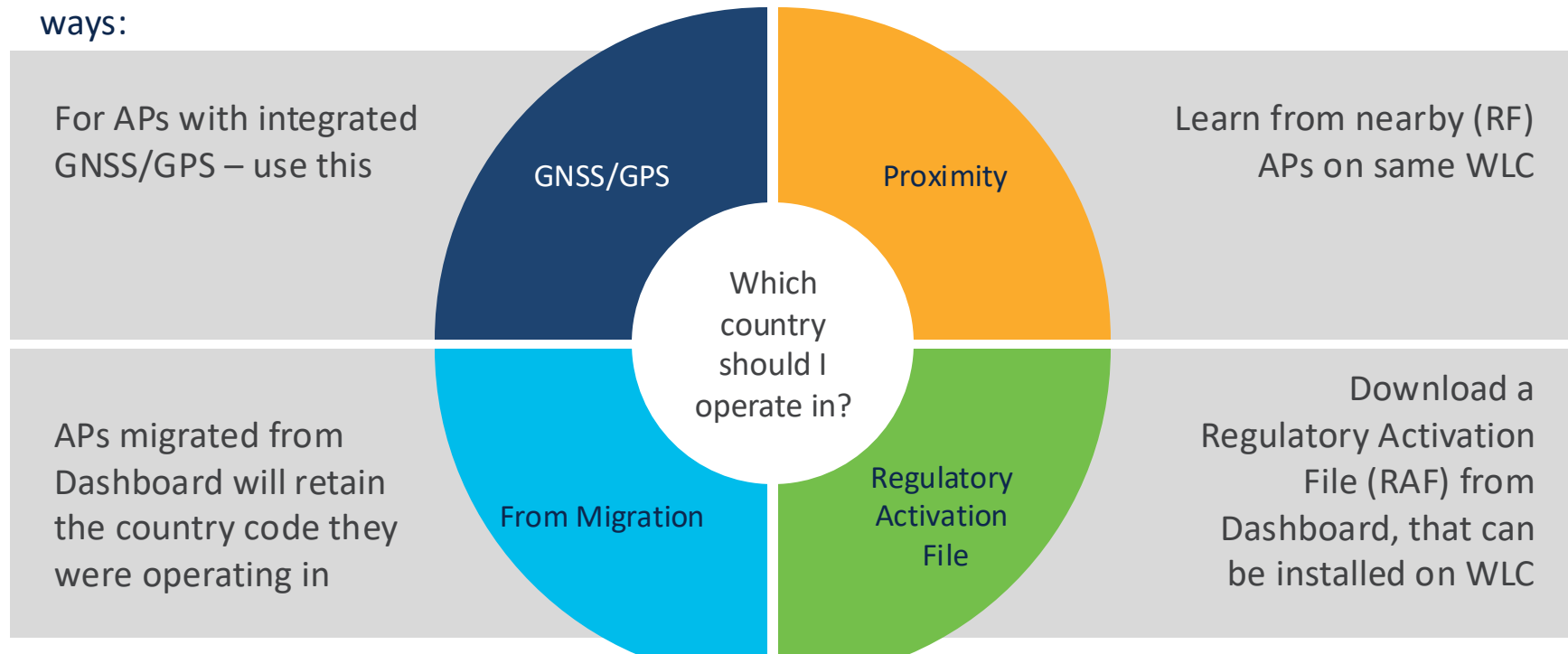


The screenshot shows the Meraki Local Status Page. On the left, a green checkmark icon is displayed above the word "Healthy" and the text "This access point is functioning normally". On the right, there are three tabs: "Connection", "Neighbors", and "Configure". The "Configure" tab is active, showing settings for radio 3 (6 GHz). The settings include "Channel" set to "Auto (161)" and "Power" set to "Auto". Below these, there is a section for "HTTP Connect Proxy" with "Use a proxy?" set to "From DHCP", "IP Address" set to "To be acquired...", and "Port" set to "Port #". A "Save" button is located below the proxy settings. At the bottom, there is a section titled "Switch to Catalyst Mode" with the text "Switch your AP's identity to Catalyst Mode" and "AP will reboot when initiated!". A "Switch to Catalyst Mode" button is located at the bottom of this section. A red bracket is drawn around the "Switch to Catalyst Mode" button and the text "AP will reboot when initiated!".

Useful for “Single AP” conversion  
(hence can’t scale for Bulk  
migration)

# Regulatory Compliance - “Country Code”

When APs are in **WLC mode**, APs will determine their Country Code in one of the following ways:



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

# Resources: GUAP – Global Use AP Deployment Guide

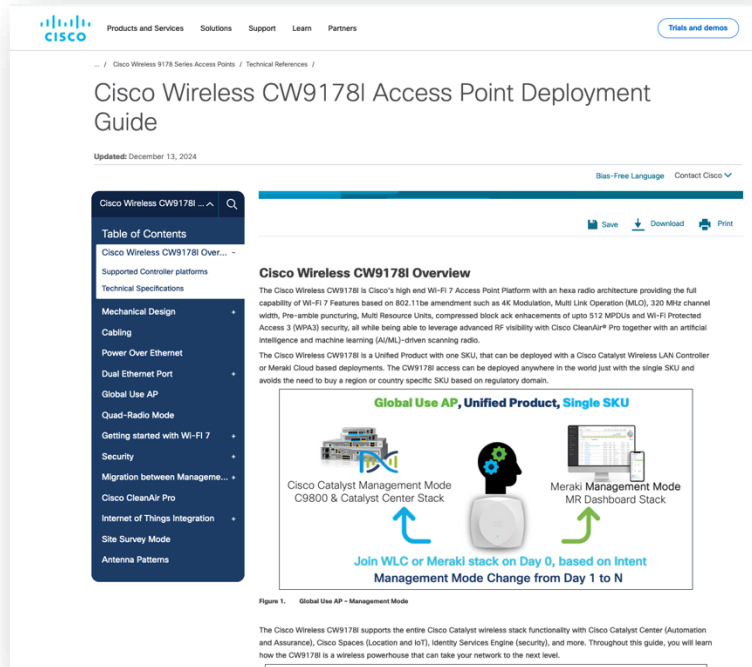


- Link: [global-use-ap-dg.html](https://www.cisco.com/c/en/us/td/docs/wireless/global-use-ap-dg.html)

The screenshot shows the Cisco Wireless Global Use Access Points Deployment Guide page. The page has a header with the Cisco logo, navigation links (Products and Services, Solutions, Support, Learn, Partners), a 'Trials and demos' button, and a search bar. The main title is 'Cisco Wireless Global Use Access Points Deployment Guide', updated on December 11, 2024. A left sidebar contains a 'Table of Contents' with links to 'Cisco Wireless Global Use AP ...', 'Map of a Global Use AP's Jour...', 'Cloud ID', 'Day 0 Workflow: Technical Det...', 'Country Code and Regulatory ...', 'Factory Reset', and 'Important Links'. The main content area is titled 'Cisco Wireless Global Use AP Overview' and includes a paragraph explaining that the Cisco Wireless CW917x Series Access Point is a Unified Hardware with a single product ID, deployable with either a Cisco Catalyst 9800 Wireless LAN Controller or Meraki Cloud-based deployments. Below this is a diagram titled 'Global Use AP, Unified Product, Single SKU' showing a central Cisco Catalyst 9800 access point. To its left is 'Cisco Catalyst Management Mode C9800 & Catalyst Center Stack' with a blue arrow pointing up to the AP. To its right is 'Meraki Management Mode MR Dashboard Stack' with a green arrow pointing up to the AP. Below the diagram, text reads 'Join WLC or Meraki stack on Day 0, based on Intent' and 'Management Mode Change from Day 1 to N'. A caption below the diagram states 'Figure 1. Global Use AP - Management Mode'. At the bottom, a paragraph explains that the Global Use AP simplifies the Cisco Wireless AP portfolio by decoupling the AP PID/SKU from geography and management mode. It lists two examples: 1. Decoupling the AP PID/SKU from geography, and 2. Decoupling AP PID/SKU from the boot mode (WLC or Meraki based). Examples of PID/SKU (in the past):

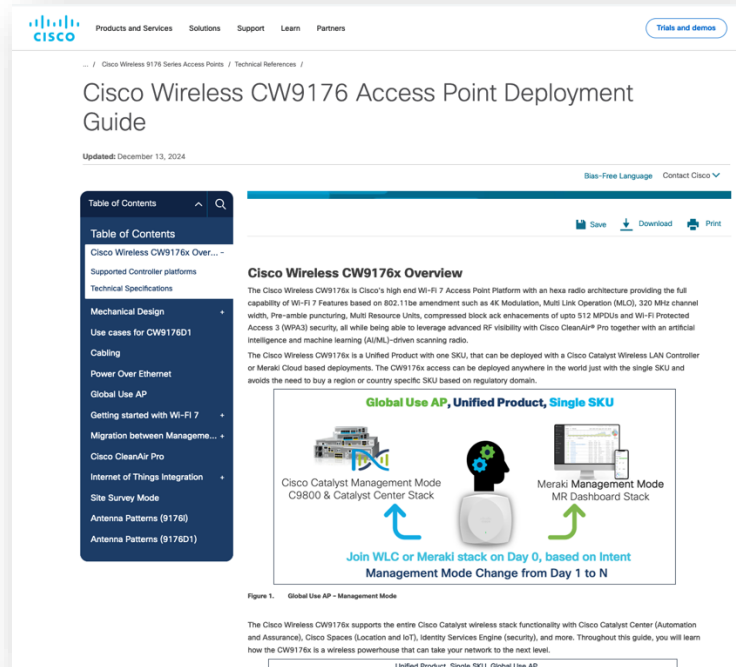
# CW9178 & CW9176 Access Point Deployment Guides

Link: [cw9178i-dg.html](https://www.cisco.com/c/en/us/td/docs/wireless/cw9178i-dg.html)



The screenshot shows the Cisco Wireless CW9178i Access Point Deployment Guide. The page title is "Cisco Wireless CW9178i Access Point Deployment Guide" with a sub-header "Updated: December 13, 2024". The left sidebar contains a "Table of Contents" with links to "Cisco Wireless CW9178i Overview", "Supported Controller platforms", "Technical Specifications", "Mechanical Design", "Cabling", "Power Over Ethernet", "Dual Ethernet Port", "Global Use AP", "Quad-Radio Mode", "Getting started with Wi-Fi 7", "Security", "Migration between Management...", "Cisco CleanAir Pro", "Internet of Things Integration", "Site Survey Mode", and "Antenna Patterns". The main content area features a "Global Use AP, Unified Product, Single SKU" section with a diagram showing the transition from "Cisco Catalyst Management Mode C9800 & Catalyst Center Stack" to "Meraki Management Mode MR Dashboard Stack" via a "Join WLC or Meraki stack on Day 0, based on Intent Management Mode Change from Day 1 to N". Below the diagram, it states: "The Cisco Wireless CW9178i supports the entire Cisco Catalyst wireless stack functionality with Cisco Catalyst Center (Automation and Assurance), Cisco Spaces (Location and IoT), Identity Services Engine (security), and more. Throughout this guide, you will learn how the CW9178i is a wireless powerhouse that can take your network to the next level."

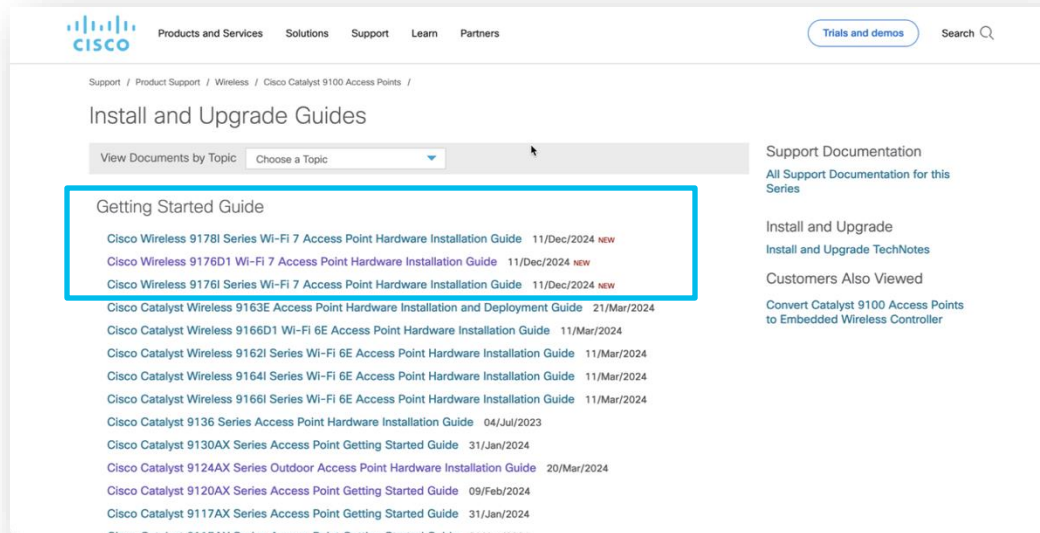
Link: [cw9176-dg.html](https://www.cisco.com/c/en/us/td/docs/wireless/cw9176-dg.html)



The screenshot shows the Cisco Wireless CW9176 Access Point Deployment Guide. The page title is "Cisco Wireless CW9176 Access Point Deployment Guide" with a sub-header "Updated: December 13, 2024". The left sidebar contains a "Table of Contents" with links to "Cisco Wireless CW9176x Overview", "Supported Controller platforms", "Technical Specifications", "Mechanical Design", "Use cases for CW9176D1", "Cabling", "Power Over Ethernet", "Global Use AP", "Getting started with Wi-Fi 7", "Migration between Management...", "Cisco CleanAir Pro", "Internet of Things Integration", "Site Survey Mode", "Antenna Patterns (9176i)", and "Antenna Patterns (9176D1)". The main content area features a "Global Use AP, Unified Product, Single SKU" section with a diagram showing the transition from "Cisco Catalyst Management Mode C9800 & Catalyst Center Stack" to "Meraki Management Mode MR Dashboard Stack" via a "Join WLC or Meraki stack on Day 0, based on Intent Management Mode Change from Day 1 to N". Below the diagram, it states: "The Cisco Wireless CW9176x supports the entire Cisco Catalyst wireless stack functionality with Cisco Catalyst Center (Automation and Assurance), Cisco Spaces (Location and IoT), Identity Services Engine (security), and more. Throughout this guide, you will learn how the CW9176x is a wireless powerhouse that can take your network to the next level."

# CW9178 & CW9176 Hardware Installation Guide

- Link: <https://www.cisco.com/c/en/us/support/wireless/catalyst-9100ax-access-points/products-installation-guides-list.html>



# Why Wi-Fi 7?





# Cisco's first Wi-Fi 7 products

Data Sheet ->  
[link](#)



CW9176I & CW9176D1

- Tri-radio, 4x4 (12ss); 2.4/5, 5, 6 GHz
- Dedicated scan radio & IoT Radio
- UWB, Accelerometer
- Built-in GNSS/GPS
- Single 10 Gbps port

Data Sheet ->  
[link](#)



CW9178I

- Quad radio, 4x4, 16ss (2.4, 5, 5,6)
- Dedicated scan radio & IoT Radio
- UWB, Accelerometer
- Built-in GNSS/GPS
- Dual 10 Gbps ports for redundancy

Both will require more than 30W of power for full radio operation

# Cisco Wireless – Wi-Fi 7



**One Simplified Product**  
for smart, secure, sustainable operations



**Resilient Wireless**  
for digital transformation



**Wi-Fi, IOT Analytics**  
for Smart Workspaces



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CleanAir® Pro

# Simplified Product

# Cisco Wireless Unified Product Evolution

0%

Wi-Fi 6



1 SKU per model



17+ SKUs per model

75%

Wi-Fi 6E



- Day0 Separate SKUs (~10)
- Initial management Mode determined at purchase.
- Post-purchase/Day N option to migrate
- Separate lead time/RMA/license
- Same Warranty

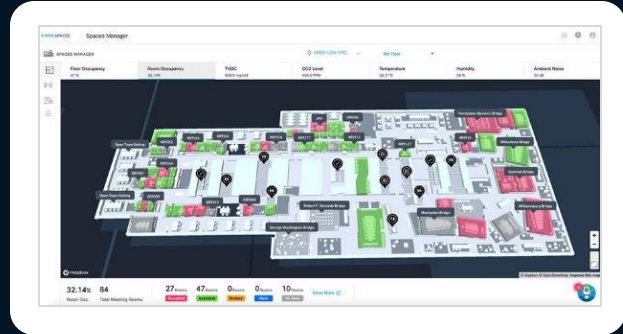
100%

Wi-Fi 7  
Global Use AP



Today!  
Join any stack on Day 0; based  
on Intent  
Management mode change  
from Day 1 to Day N

# Wi-Fi licensing includes Cisco Spaces



## Unified Licensing (UL):

### UL – Essentials

Meraki  
Enterprise

DNA-E

Spaces  
Extend

### UL – Advantage

Meraki  
Advanced

DNA-A

Spaces  
ACT

# Resilient Wireless

# Cisco Networking Cloud

TechClub odkaz  
(17.09.2024):  
Situace ze života IT  
správce

## Unify the Services

AI Services  
(ex. AI RRM)



Policy



Analytics



APIs



User/Application  
Experience



## Unify the Management



On prem  
Dashboard

Cloud  
Dashboard



## Unify the Infrastructure



Common  
edge platform



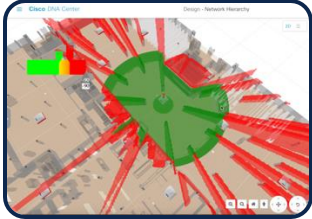
Common  
platform

# AI Ops Main Services

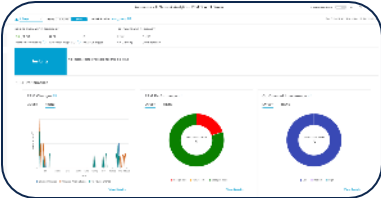
## Wi-Fi 6E/7 Integrations



## Wireless 3D Analyzer



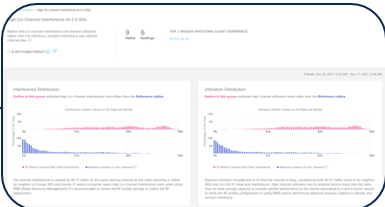
## AI-Enhanced RRM



## AI Network & Endpoint Analytics



## Performance Advisories



## Device Ecosystem Partnerships



ThousandEyes





# AI-Enhanced RRM Now

## 1 Enable AI-Enhanced RRM cloud access in Settings

### Cisco AI Analytics

#### AI Network Analytics

AI Network Analytics harnesses machine learning to drive intelligence in the network, empowering administrators to effectively improve network performance and accelerate issue resolution. AI Network Analytics eliminates noise and false positives significantly by learning the network behavior and adapting to your network environment.



Enable AI Network Analytics

#### AI-ENHANCED RRM

Provides sophisticated closed-loop optimization of your radio network based on historical data, while delivering visual insights into why and how. AI-Enhanced RRM delivers macro level suggestions for config optimization and the ability to apply these within minutes. AI-Enhanced RRM is applicable to sites running Catalyst 9800.



This feature can be enabled only if AI Network Analytics is enabled.

## 2 Select the newly designed workflow and deployment option!



### Configure AI-Enhanced RRM

Deploy AI-enhanced RRM with or without provisioning your wireless controllers and access points.

Wireless

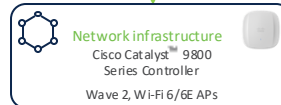
...

### Enable Without Device Provisioning

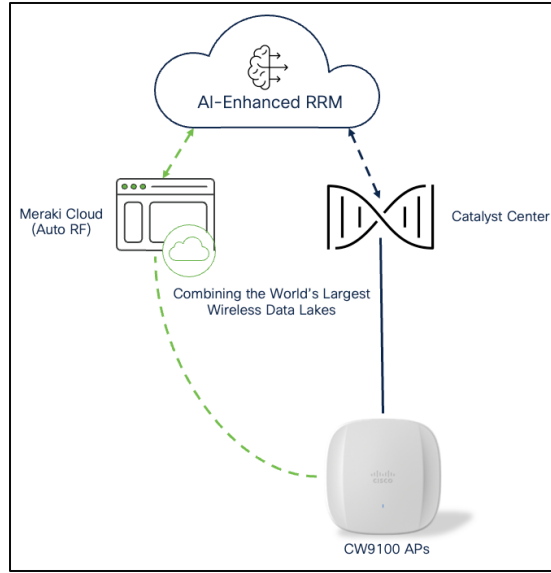
This flow enables AI-Enhanced RRM without provisioning your wireless controllers or access points.

If you do not want Cisco DNA Center to manage the configuration of your devices, choose this option.

## 3 AI-Enhanced RRM is enabled without device provisioning!



# Best Enterprise Wi-Fi Solution



# Wi-Fi and IoT Analytics



# The OS for Smart Spaces

A comprehensive set of software tools and services to make your buildings smart



## Multi-sensor Connect

No gateways  
Sensor & Partner  
Ecosystem



## Advanced Location

Wi-Fi | BLE | UWB  
Presence, Occupancy &  
Identity

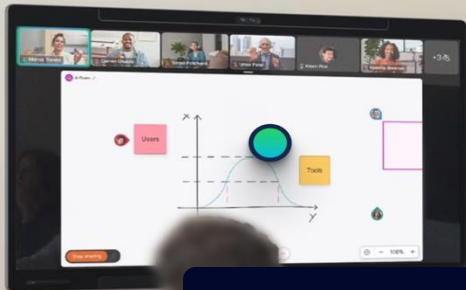


## APIs & Integrations

One API for the  
building | Enterprise  
Integrations

Cisco Spaces Platform

# Cisco Spaces turns your network into a sensor



## Cisco Collaboration Devices

- Room & Desk Occupancy
- Air Quality
- Temperature & Humidity



## Catalyst APs

- Occupancy
- BLE Gateway



## Cisco Switches

- Occupancy
- Wired Gateway



## MT Sensors

- Temperature
- Humidity
- Indoor Air Quality
- CO<sub>2</sub>



## Meraki APs

- Occupancy
- Sensor Gateway



## Meraki Cameras

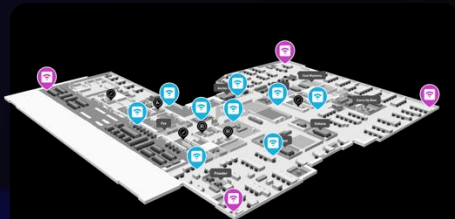
- People Count



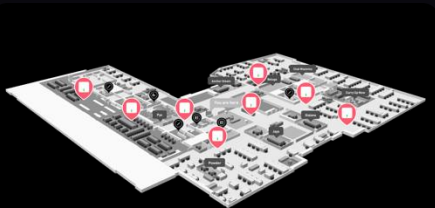
## 3rd Party Sensors

- Occupancy
- People Count
- Air Quality, CO<sub>2</sub>
- Asset Location and More

# 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

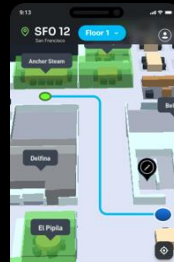


**Digital Signage Experience**  
for Employees & Facilities Teams



**Occupancy Analytics**  
for Real-Estate & Facilities

**Indoor Wayfinding**  
for Employees & WPR



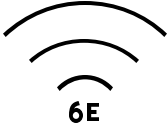
**Contextual Notifications**  
for Marketing & Loyalty




**APIs**  
To extend to enterprise



# Wi-Fi 6 & 6E Access Points




Dual Mode APs




CleanAir® Pro

9162




CleanAir Pro

9164



CleanAir Pro

9166



9166D1



CleanAir Pro

9136



MR57





9105I/W



MR28/36/36H



9115



MR44



RF-ASIC

9120



MR46



RF-ASIC

9130



MR56



RF-ASIC

9124



MR78/76/86

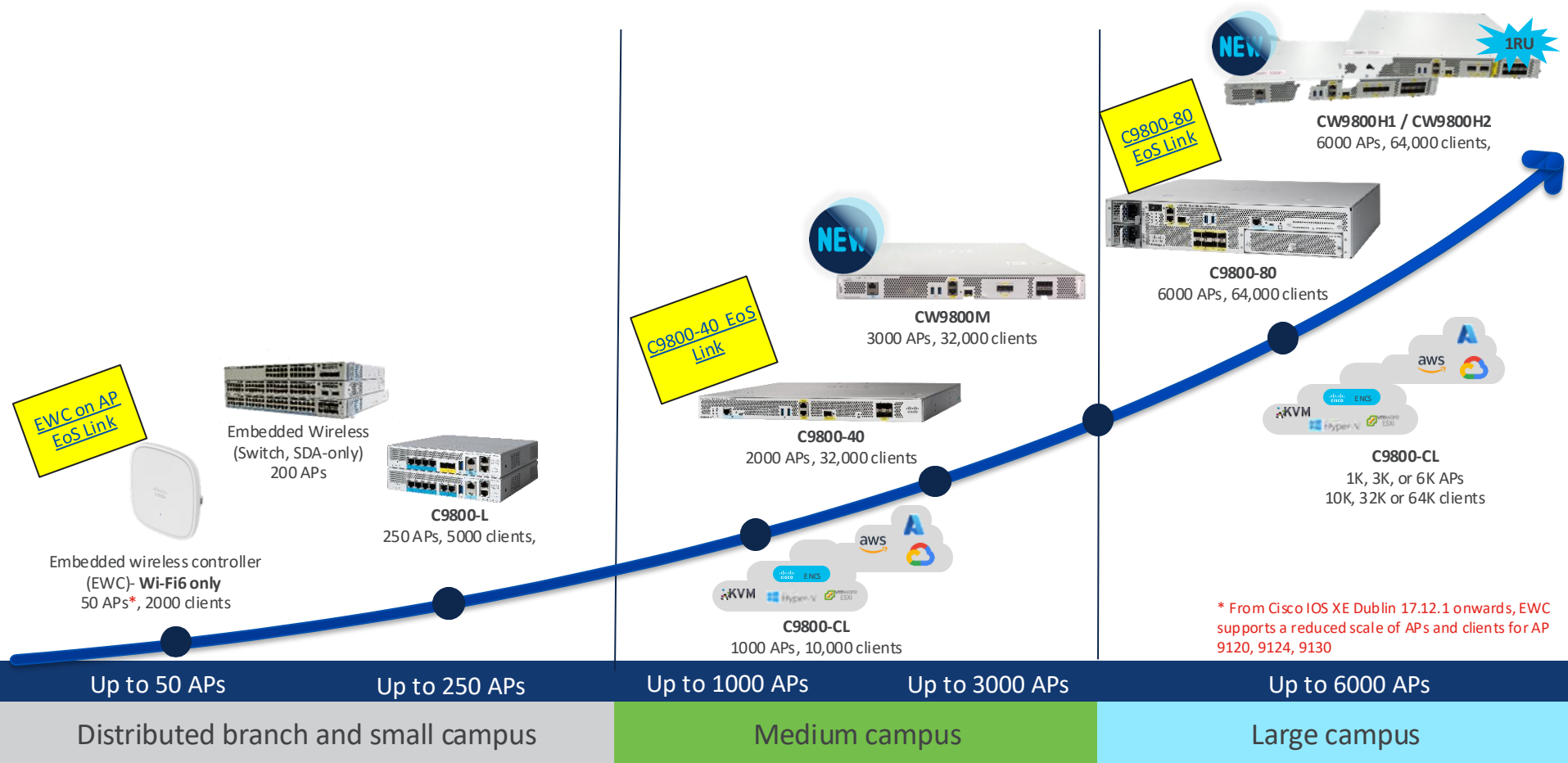
Dual Mode APs



NEW

9163

# Cisco 9800 Wireless Infrastructure





# C9800 Controller EoS Announcement! (Jan 9, 2025)

9800-40 and 9800-80 only! (9800-L is NOT EoS)

Milestone	Definition	Date
End-of-Life Announcement Date	The date the document that announces the end-of-sale and end-of-life of a product is distributed to the general public.	January 9, 2025
End-of-Sale Date: HW,OS SW,Accessory	The last date to order the product through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.	December 31, 2025
Last Ship Date: HW,OS SW,Accessory	The last-possible ship date that can be requested of Cisco and/or its contract manufacturers. Actual ship date is dependent on lead time.	March 31, 2026
End of SW Maintenance Releases Date: HW,OS SW	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	December 31, 2026
End of Vulnerability/ Security Support: HW	The last date that Cisco Engineering may release a planned maintenance release or scheduled software remedy for a security vulnerability issue.	December 31, 2030

End of Routine Failure Analysis Date: HW	The last-possible date a routine failure analysis may be performed to determine the cause of hardware product failure or defect.	December 31, 2026
End of New Service Attachment Date: HW,OS SW	For equipment and software that is not covered by a service-and-support contract, this is the last date to order a new service-and-support contract or add the equipment and/or software to an existing service-and-support contract.	December 31, 2026
End of Service Contract Renewal Date: HW,OS SW	The last date to extend or renew a service contract for the product.	March 31, 2030
Last Date of Support: HW,OS SW,Accessory	The last date to receive applicable service and support for the product as entitled by active service contracts or by warranty terms and conditions. After this date, all support services for the product are unavailable, and the product becomes obsolete.	December 31, 2030

HW = Hardware    OS SW = Operating System Software    App. SW = Application Software

- Link: <https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-series-wireless-controllers/catalyst-c9800-wireless-lan-controller-eol.html>



# Děkujeme za Vaši pozornost

Následující Tech Club webinář:

18.2. Cisco Licencování

Přednášející: Peter Morvay



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



The bridge to possible