

The Wi-Fi Buffet

Secure Network Track

Dan Davis

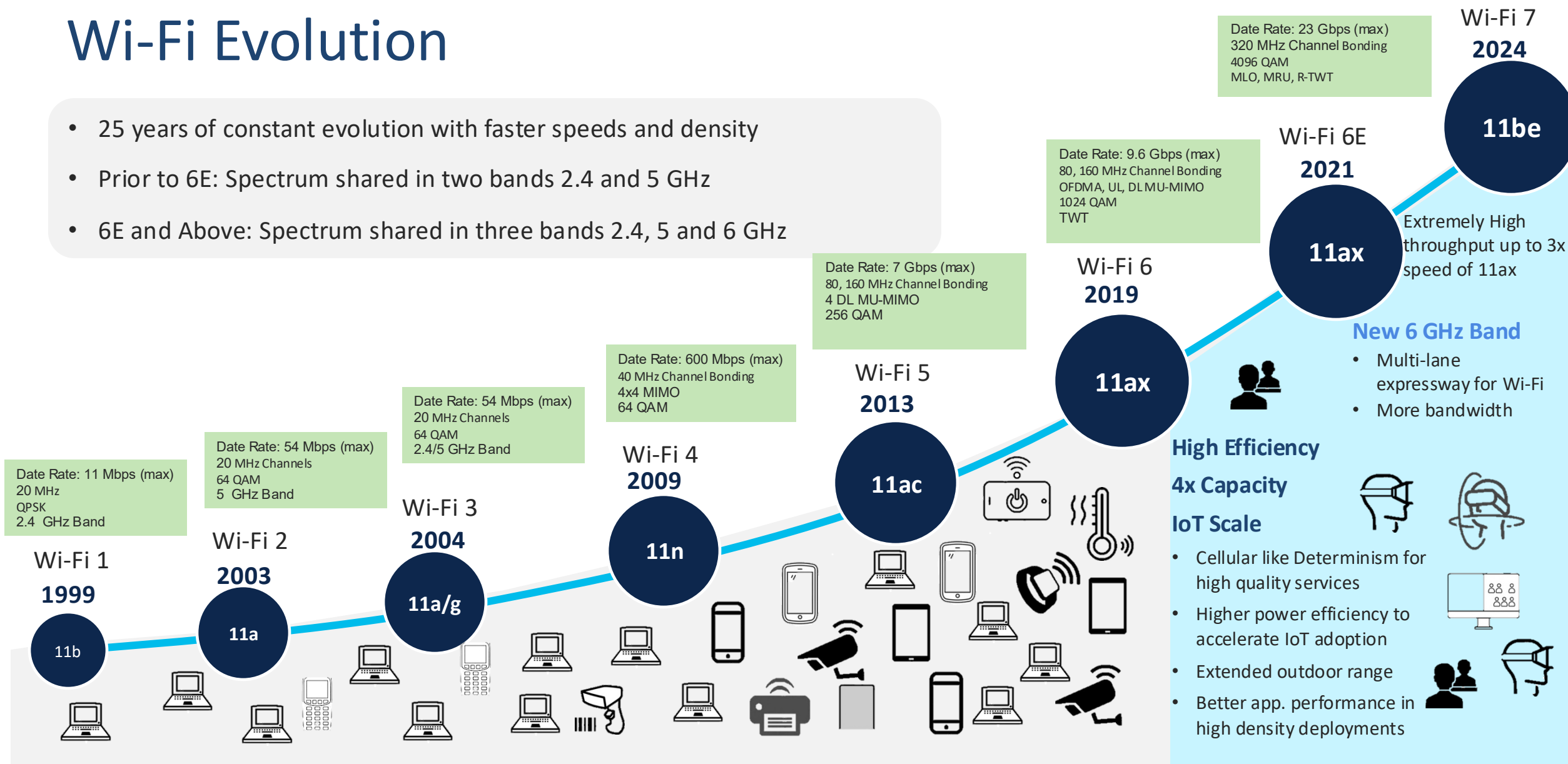


~MENU~

- Wi-Fi 7 and historical perspective
 - Global Use APs
 - 6GHz
 - Multi Link Operation
 - Security - WPA3
- Synthetic Testing
- Location Tech and Use Cases
- Campus Gateway
- Wireless and AI
- URWB – Ultra Reliable Wireless Backhaul
-

Wi-Fi Evolution

- 25 years of constant evolution with faster speeds and density
- Prior to 6E: Spectrum shared in two bands 2.4 and 5 GHz
- 6E and Above: Spectrum shared in three bands 2.4, 5 and 6 GHz



Access the best enterprise Wi-Fi with the Cisco Wi-Fi 7 portfolio



CW9172

- Omni and wall mount models
- Quad-radio, tri-band
- Flexible radio assignment



CW9178

- High density coverage
- Penta-radio, tri-band, with UWB
- Dual 10G redundant power uplinks



CW9176

- Omni and internal directional models
- Quad-radio, tri-band, with UWB
- Flexible radio assignment



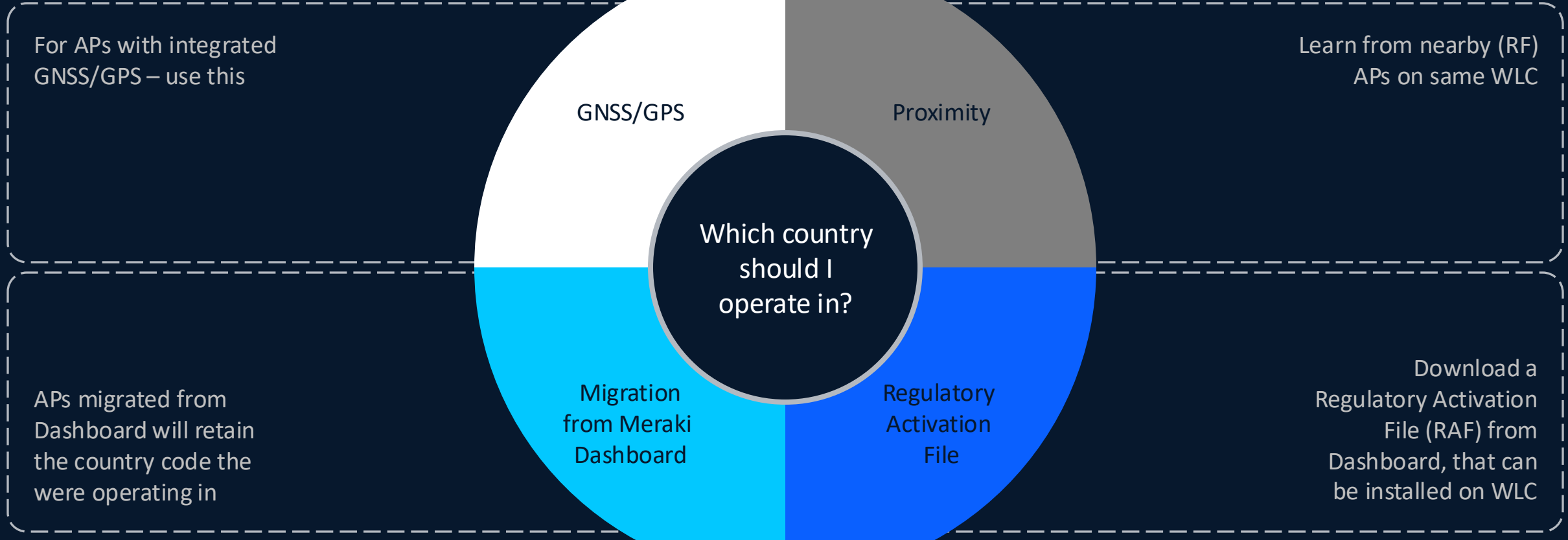
CW9179F

- Enterprise grade for large venues
- Indoor/Outdoor Convertible
- Software configurable beam patterns

Let's zoom in on "Country Code"

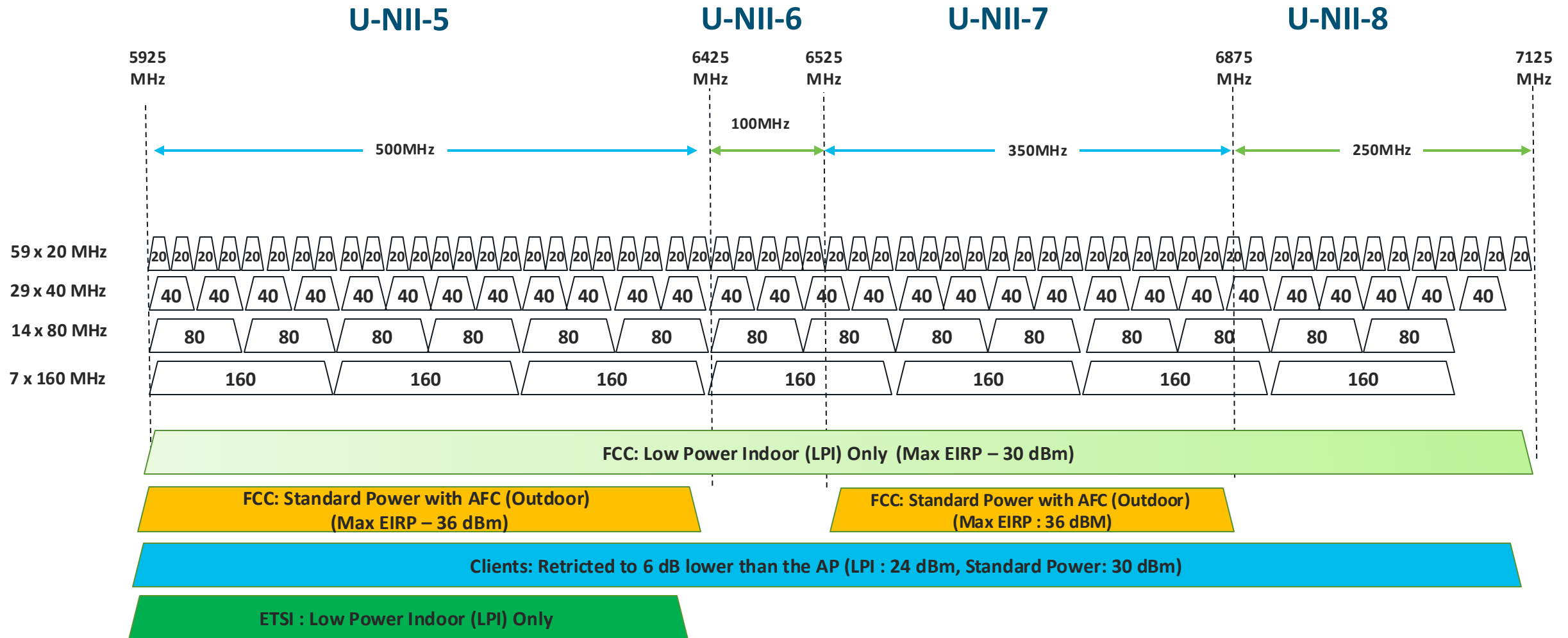
Catalyst Mode

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!

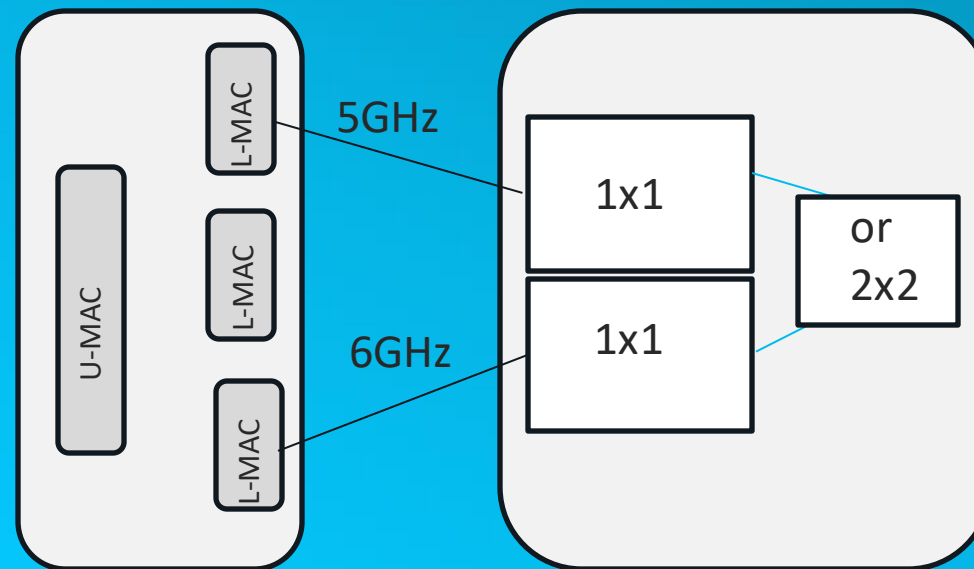
6GHz Spectrum- Equipment Classes & Regulations



Wi-Fi 7 – Multilink (MLO)



Enhanced Multi-Link Single Radio (eMLSR)



Goal: Enable Wi-Fi 7, 6GHz, and WPA3 across corporate, IoT, and guest WLANs.



Wi-Fi 6E and Wi-Fi 7 require WPA3!

WPA2 was a 2004 release, WPA3 is more secure.

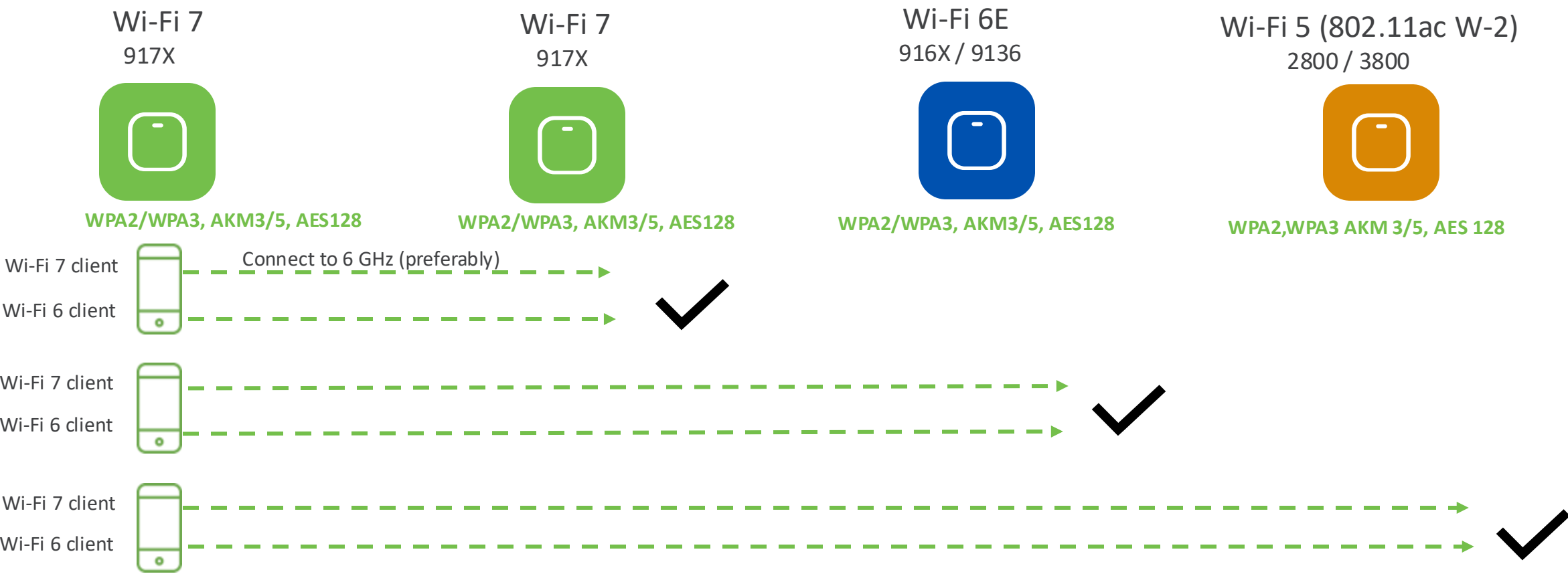


Some Key Points

- 1.) AKM – Authentication Key Management, IEEE speak for security configurations
- 2.) Transition Mode - an SSID can have WPA2 and WPA3 configured supporting both security types.
- 3.) Some code changes on Meraki (32.4) and Catalyst(17.18) change the behavior.
- 4.) You are only as secure as your weakest security.
- 5.) When using 802.1x or SAE you should have a Fast Transition (802.11r) protocol enabled.
- 6.) All clients, and OSes are not the same. Test!
- 7.) PSK might require a second SSID
- 8.) Guest networks will need a separate SSID for Wi-Fi 6E and 7

Wi-Fi 7 Single SSID – Corporate SSID (802.1x)

(Transition Mode)



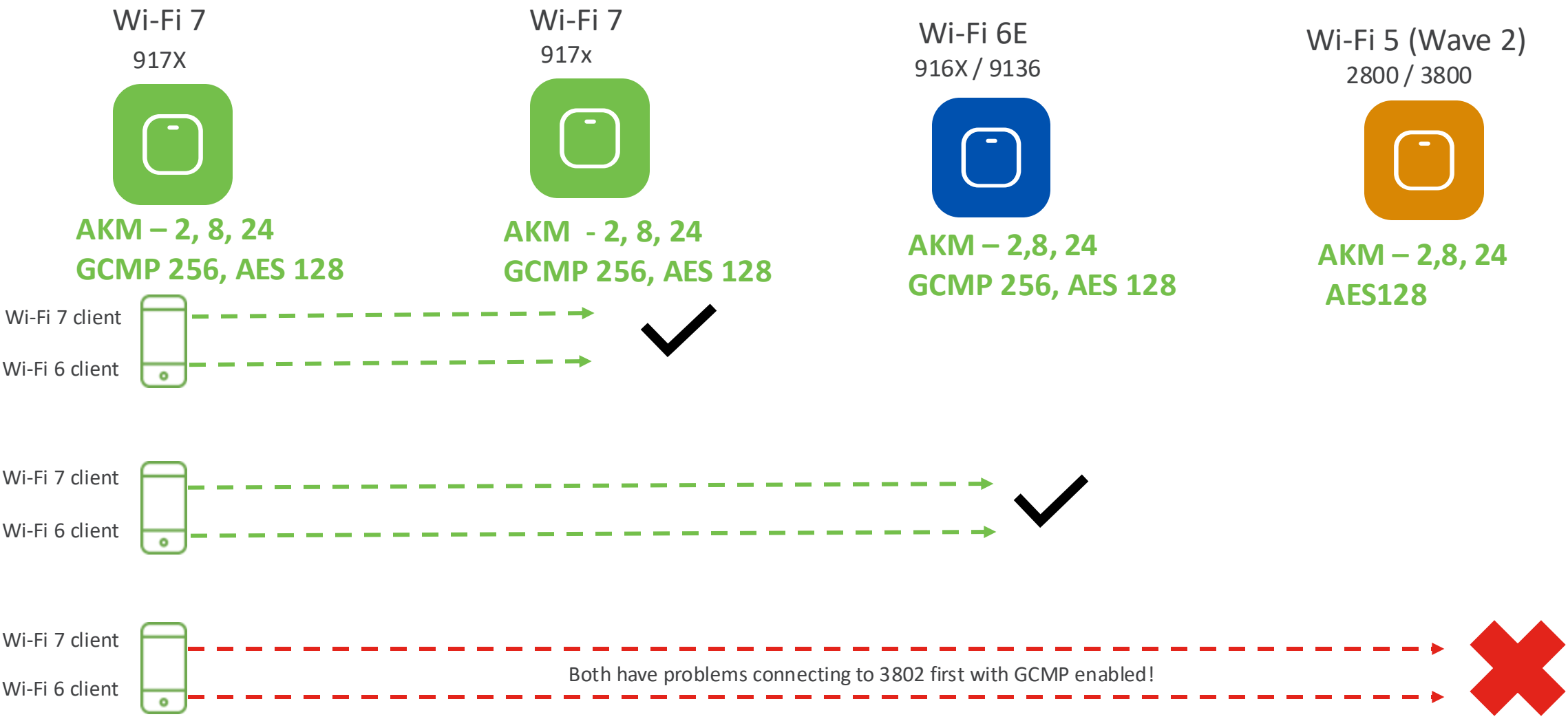
Wi-Fi 7 client – iPhone 16, v. 26.01

Wi-Fi 6 client – iPhone 11, v. 18.6.2

Transition Mode:
WLAN Profile: WPA2 and WPA3 both using AKM3/5
AKM 3 FT-802.1X
AKM 5 8021X-SHA256,
Cipher AES128

Wi-Fi 7 Single SSID – Personal (SAE) IoT Use Case

Transition Mode

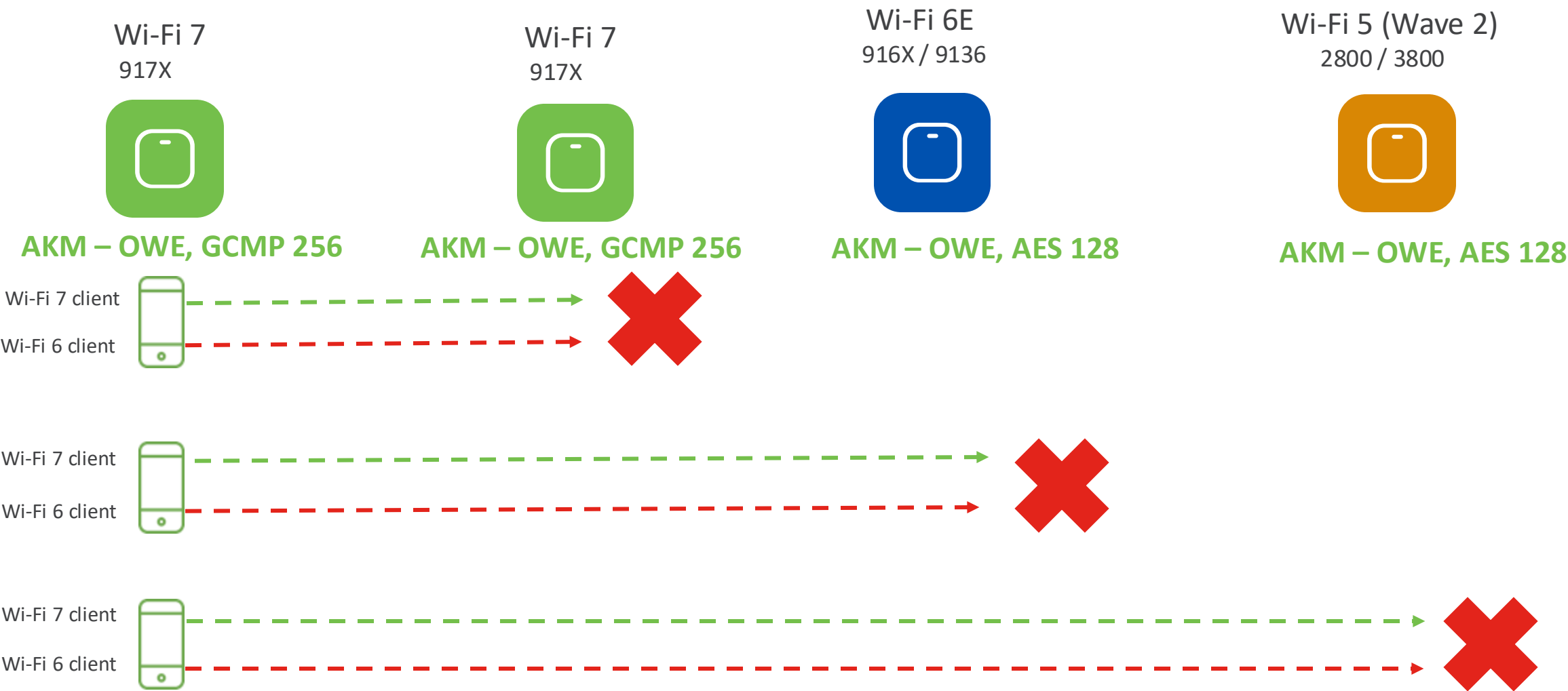


Wi-Fi 7 client – iPhone 16, v. 26.01

Wi-Fi 6 client – iPhone 11, v. 18.6.2

Transition Mode:
WLAN Profile: AKM 2,8,24
WPA3 Personal, AKM 2: PSK, AKM 8: SAE, AKM 24: SAE-EXT
Cipher – AES128,GCMP 256

Wi-Fi 7 Single SSID – Guest SSID - OWE (Opportunistic Wireless Encryption)



Wi-Fi 7 client – iPhone 16, v. 26.01

Wi-Fi 6 client – iPhone 11, v. 18.6.2

WLAN Profile:
Enhanced Open, AKM: OWE, Cipher: AES, GCMP256

Wireless synthetic testing

Convert access points into synthetic clients to run network and application tests...and more.

1

Accelerate Issue Resolution

Reduce MTTR by quickly identifying issues, understanding root causes, and resolving them faster with network baselining and validation along with actionable insights.

2

Proactively Assure Readiness

Validate infrastructure performance with scheduled synthetic tests, catching issues early – before users connect and after configuration changes occur.

3

End-to-End Visibility

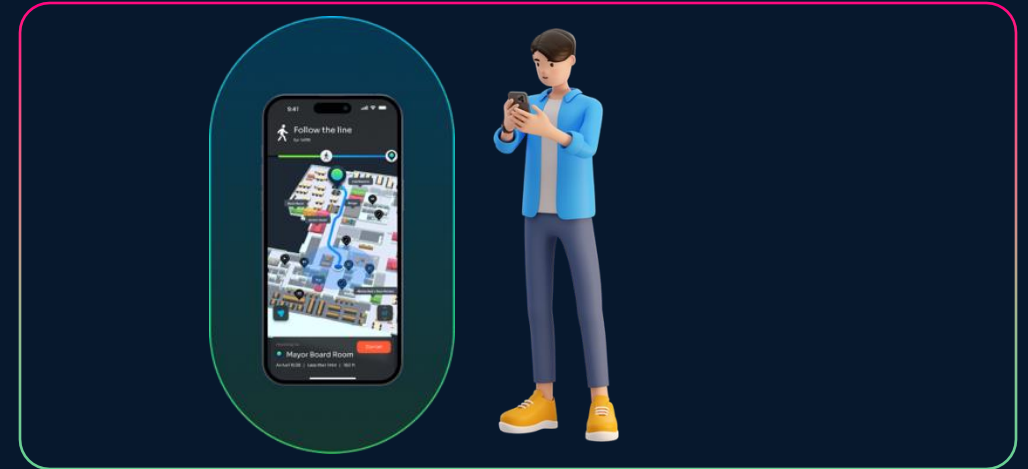
Track application performance from AP to cloud, monitor unmanaged devices, and run natively on Cisco Wi-Fi APs – no additional hardware required.

Received Singal Strength (RSSI)



Accuracy 20-30'

Bluetooth Low Energy (BLE) RSSI



Accuracy 9-15'



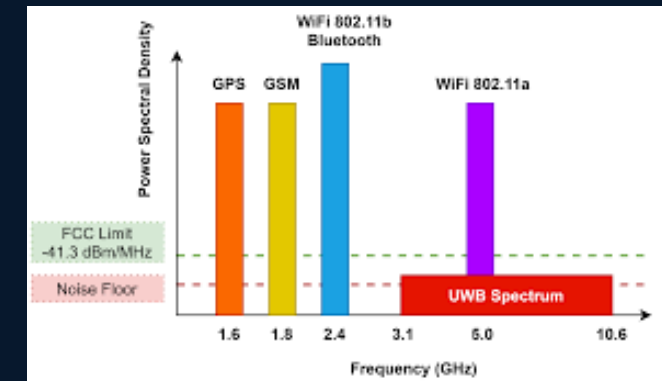
The OS for Smart Spaces

Fine Time Measurements (FTM, 802.11 mc)



Line of Sight 3-6'

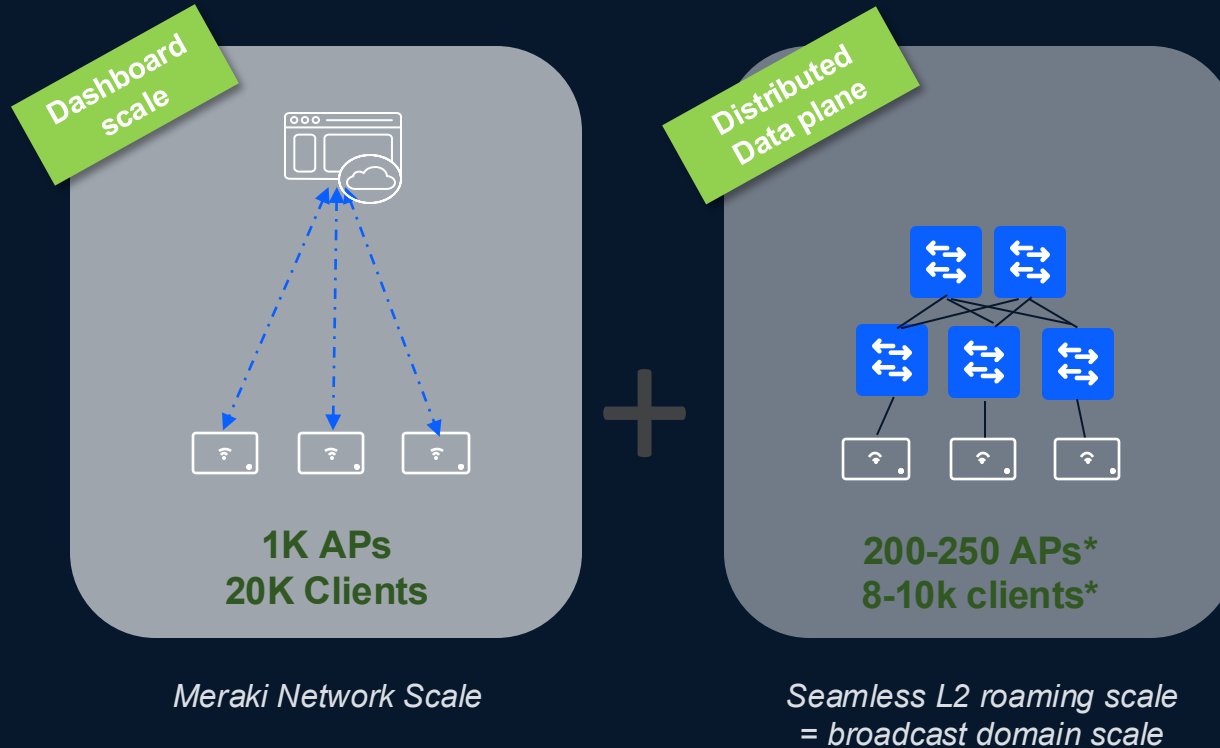
Ultra Wideband (UWB, 802.15.4)



Accuracy 3''

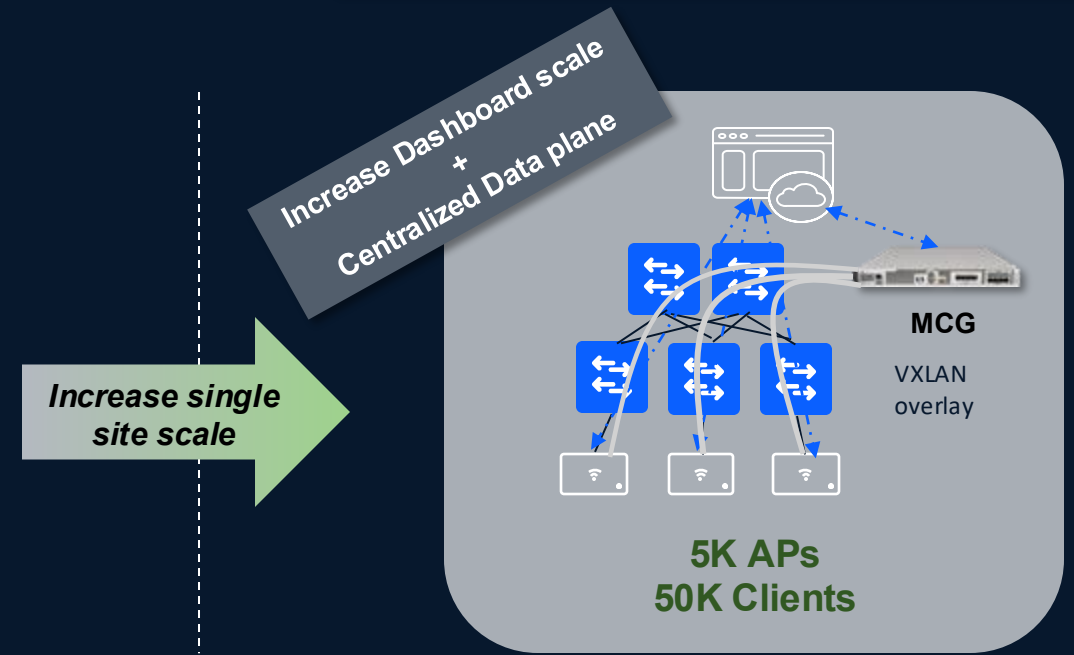
What is a Campus Gateway?

Roaming domain scale without CG



(*) not a hard limit. Calculated based on MAC/ARP tables and STP limitations. Detailed info in CL session BRKEWN-2035

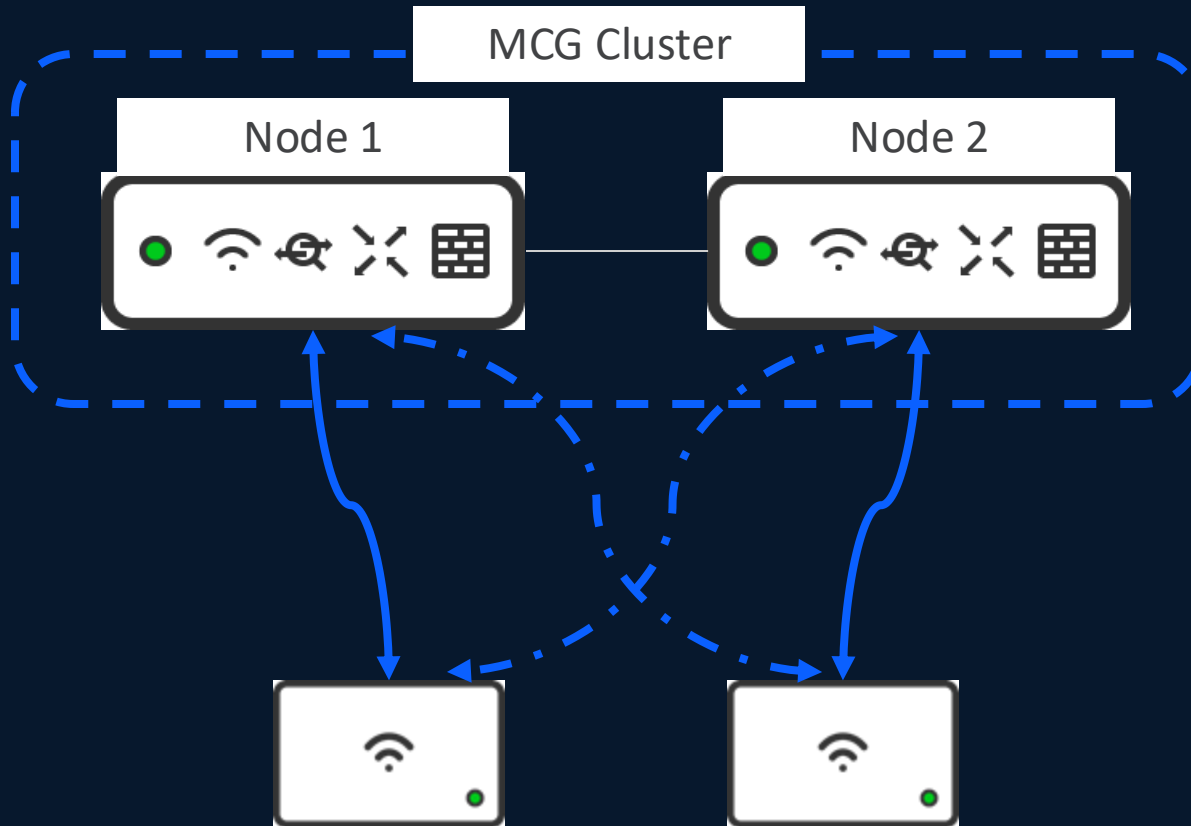
Roaming domain scale with MCG



VXLAN overlay enables L3 roaming and client & AP scale to match Meraki Network scale in a single site

Use a CG every time you have a large roaming domain (>200/250 APs) and/or need to centralized data plane solution for IT operation reasons.

MCG – Active/Active High Availability



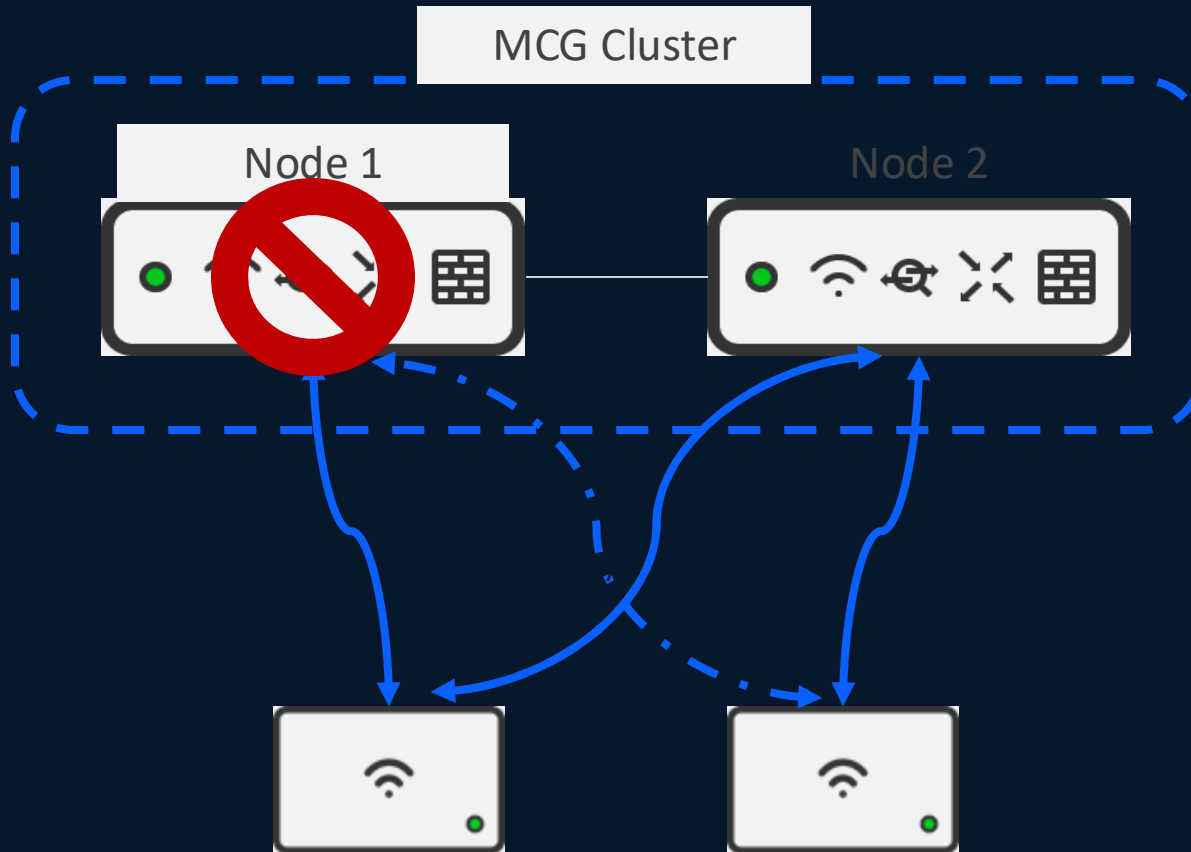
Runs in Active-Active with APs load balanced between the nodes in the cluster*

MRs receive a list of MCGs in a cluster and connect to Primary and Secondary MCGs

When Primary MCG node fails, the connected MRs will failover to the Secondary MCG in the cluster.

AP and Gateway are cloud managed. VXLAN is used for data, QUIC for control channel

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AI Assistant Demo



- ✓ Troubleshooting
- ✓ Monitoring
- ✓ Configurations



How can I help today?

Choose a suggestion or use the text field to ask a question. I have limitations and won't always get it right, but your feedback will help me improve.

What are recent config changes in my network?

Show me the Top 10 most utilized APs

List any firmware updates for my routers

How do I configure WPA2-Enterprise in the dashboard?

Ask the AI Assistant a question

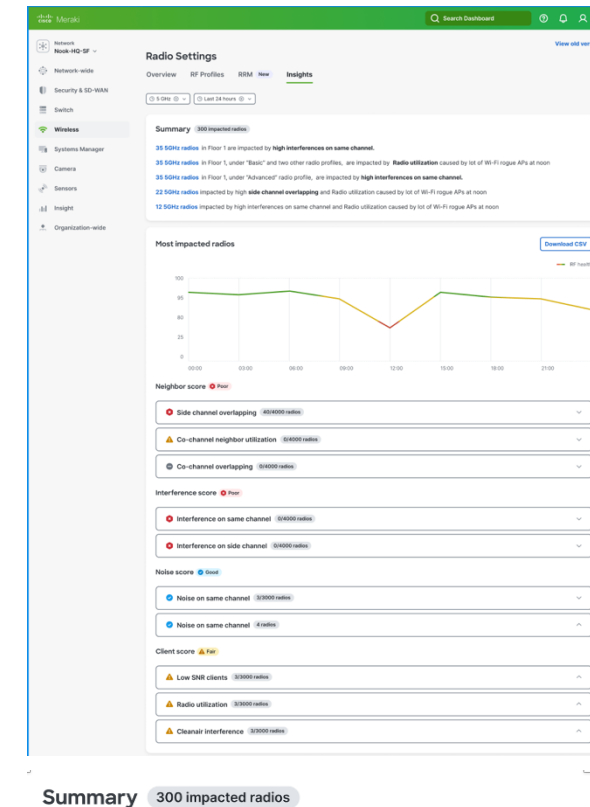
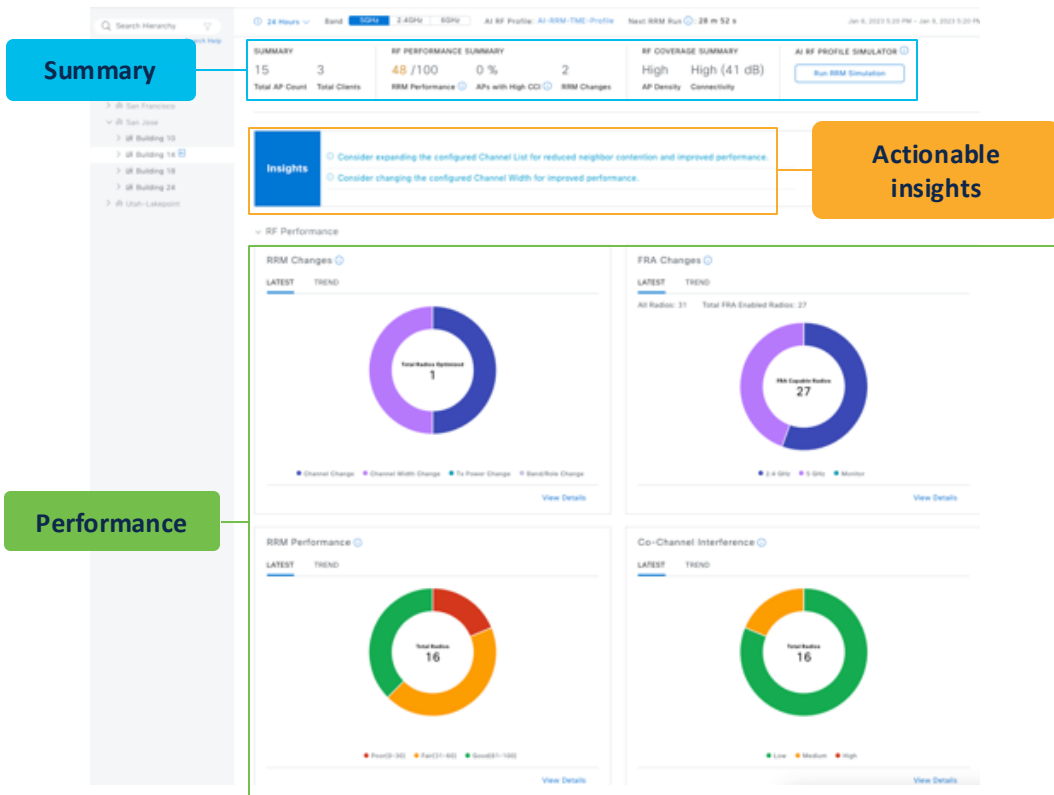


Assistant can make mistakes. Verify responses. Learn how the AI Assistant handles your data at [AI Assistant Data Privacy](#).

AI-Enhanced RRM is AI that Powers RF Optimization

Catalyst Center

Meraki



Impacted Radio Trends

Download Raw data for serviceability

Identify what's the most prevalent root cause of the impact

- Neighbor score
- Interference score
- Noise score
- Client score

35 5GHz radios in Floor 1 are impacted by **high interferences on same channel**.

35 5GHz radios in Floor 1, under "Basic" and two other radio profiles, are impacted by **Radio utilization** caused by lot of Wi-Fi rogue APs at noon

AI-Enhanced RRM Customer – University of British Columbia (UBC)

Interference Lowered on 2.4 GHz and Client Capacity Increased on 5 GHz

Deployment highlights

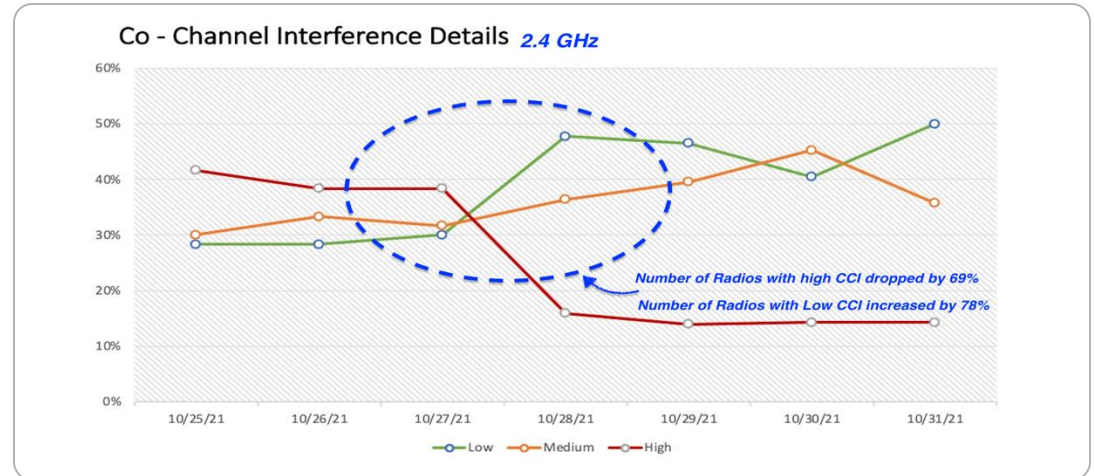
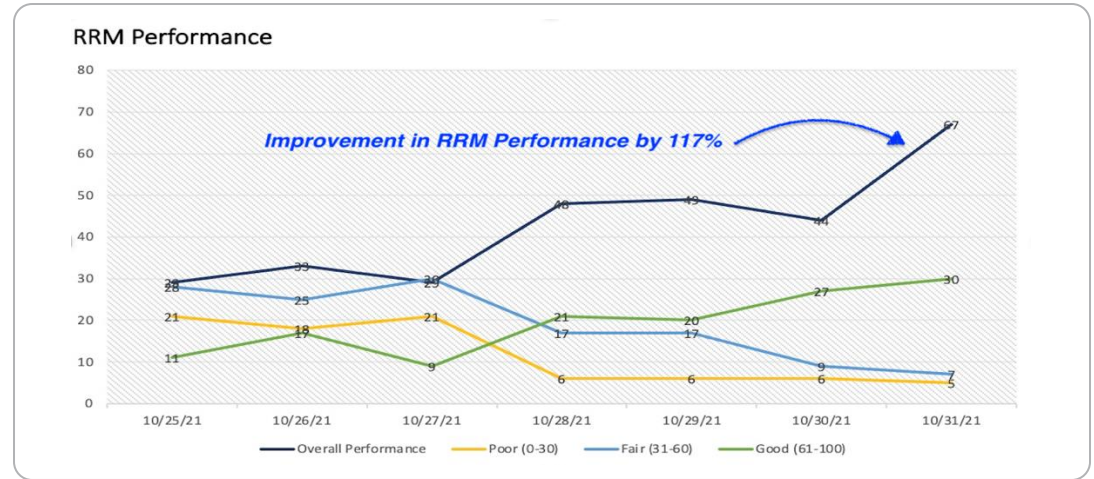
- **Location:** University building
- **Network:** 63 APs in high density
- **Client count:** Peak 639, average 430, 90% are on 5 GHz

Before AI-Enhanced RRM

- **2.4-GHz pain point:** High interference
- **5-GHz pain point:** Low capacity, since 90% of endpoints are there

After AI-Enhanced RRM

- **Optimization:** 61% of 2.4-GHz radios changed to dual 5 GHz or monitor mode
- **2.4-GHz outcome:** Co-Channel Interference (CCI) dropped by 33% for 2.4 GHz
- **5-GHz outcome:** 5 GHz improved with an increase of 8 dB in Signal-to-Noise Ratio (SNR)



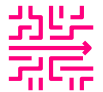
URWB Ultra-Reliable Wireless Backhaul



End-to-End Overlay

Ultra-fast failover
Carrier-grade availability

Make-before-break
handoff

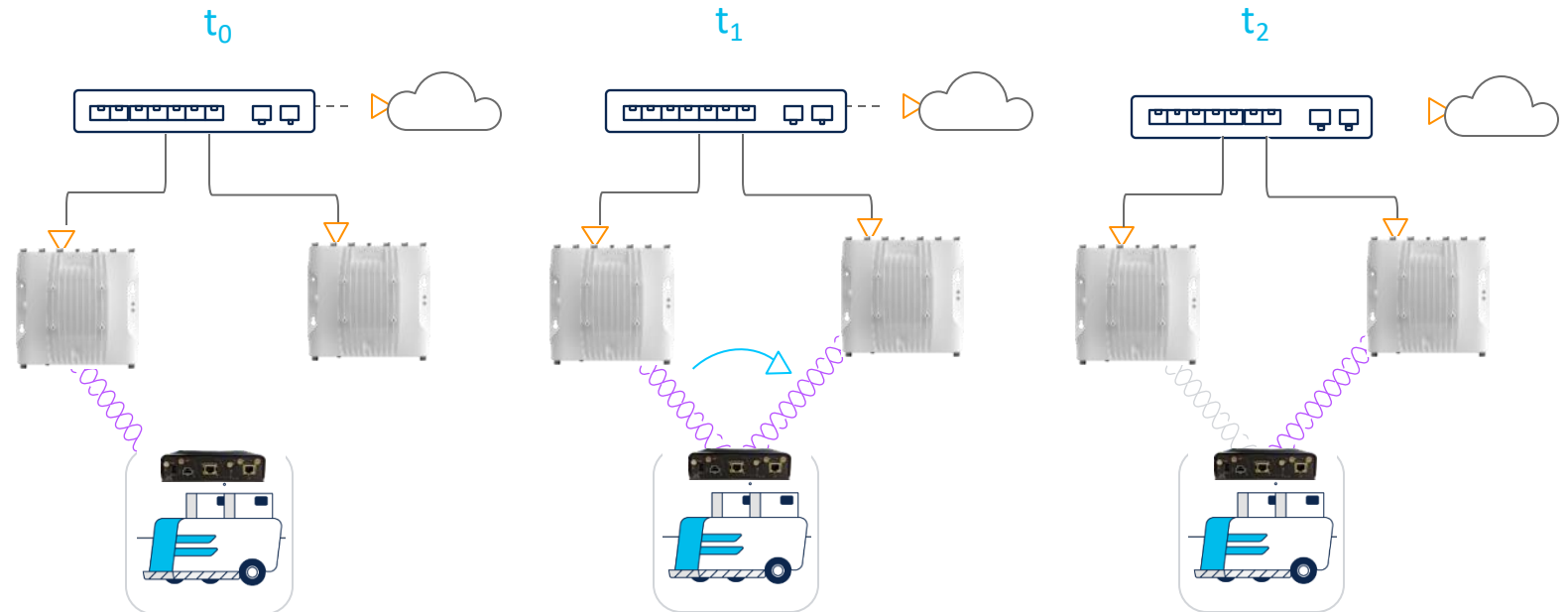


Multipath operations
(MPO)

Wi-Fi

URWB

Make-before-break
handoff

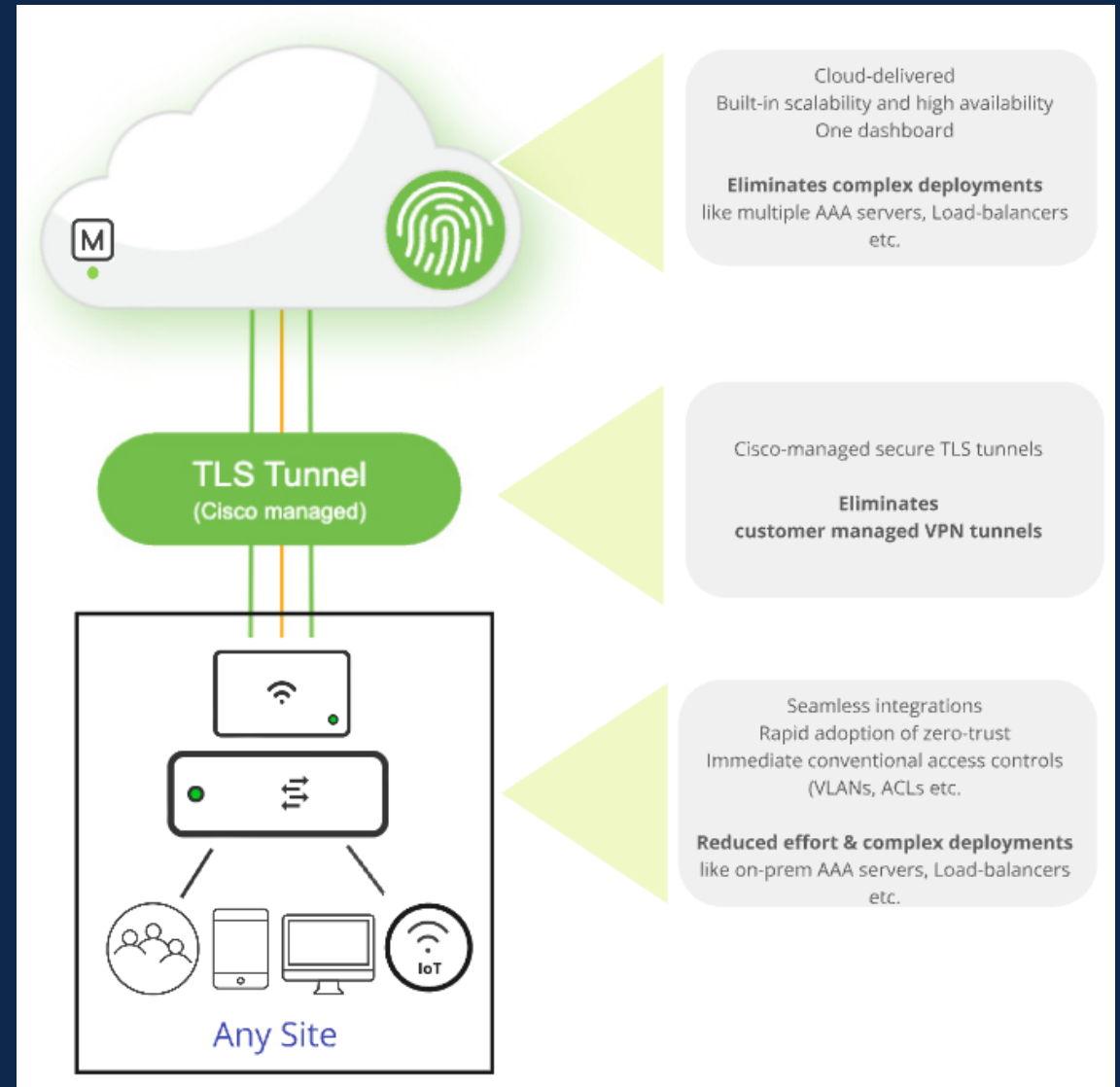


Introducing Access Manager

Network Access Control in pure SaaS form factor

Cloud-delivered access control services to **enforce identity and context-based access** to the users and devices

- **Multi-tenant SaaS** (Software as a Service) natively available in Cisco Meraki Dashboard
- **Highly available and scalable** services globally distributed across the shards
- **Secure RADIUS transport over 256-bit** encrypted Meraki dashboard management tunnel
- **Simplified and rapid Zero-Trust** adoption using identity based micro-segmentation



Early Access Features



Authentication methods

Authenticate users and devices using



EAP-TLS (certificate)



EAP-TTLS
(Username/Password)



MAB (MAC Authentication Bypass)



Identity & Context

Match following identity & context attributes



Certificate Attributes



RADIUS attributes



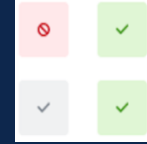
Entra ID attributes



Networks, SSIDs, connection details etc.



Endpoints and their groups



Authorization Results

Apply following authorizations



Adaptive Policy Group



L3 ACL/Group Policy



VLAN Assignment

iPSK passphrase (wireless only)

Thank you

