Co přinesl Cisco Live pro podnikové sítě

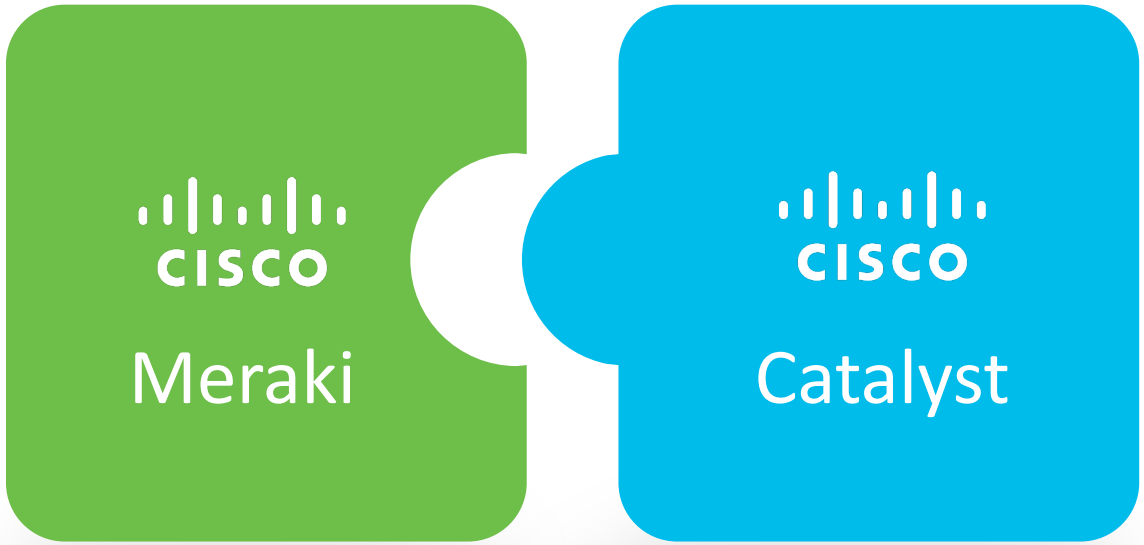
Dominik Soukup
Jaromír Pilař
26.7.2022

Agenda

- Catalyst & Meraki integrace
- Catalyst 9200CX
- Catalyst Wireless AP
- Doporučení pro nasazení WiFi 6E
- DNAC a DNAS novinky

Accelerating the transition to a cloud-managed networking experience

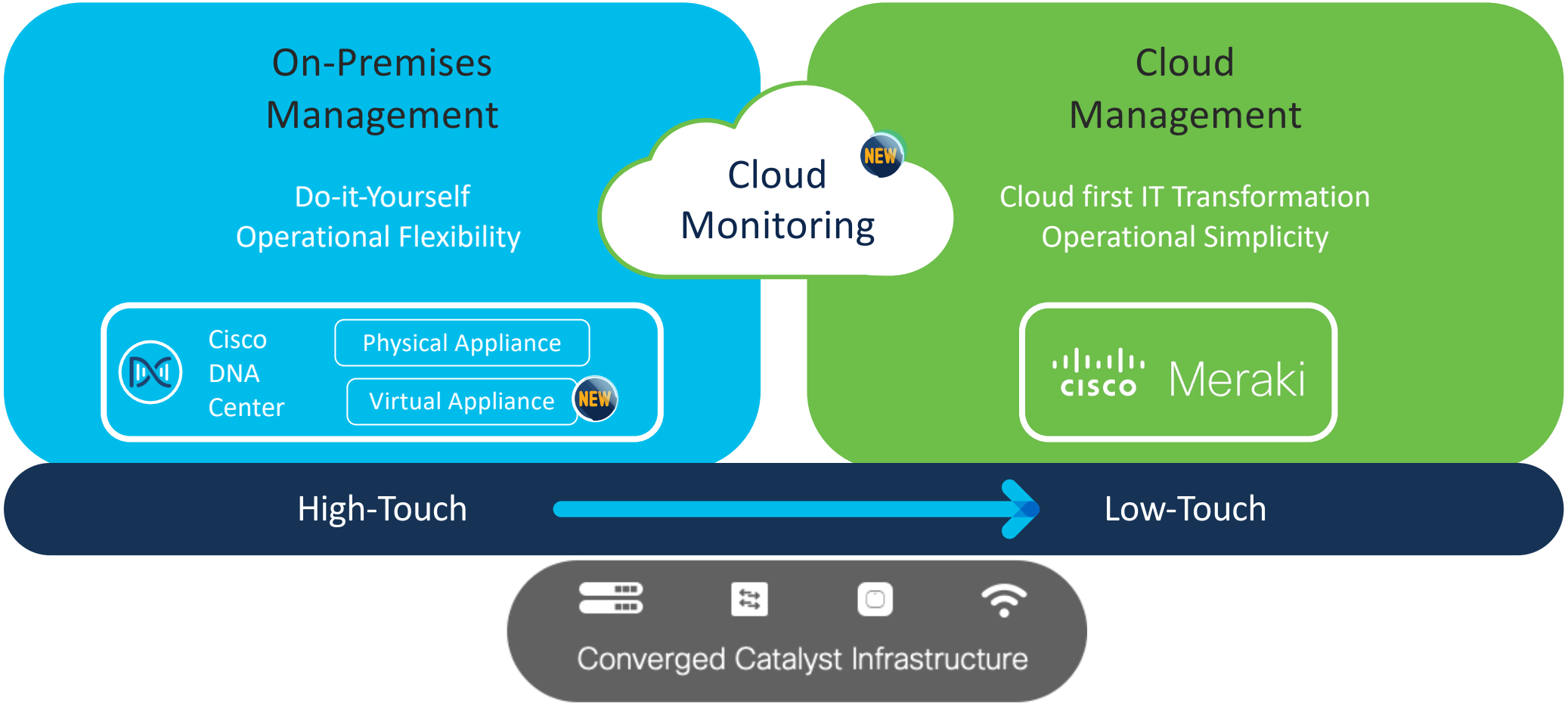
#1 in cloud managed networks



#1 in networking

Your IT operating model, your way

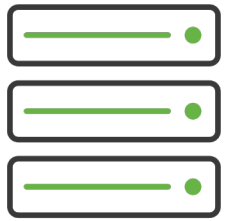
Flexibility, choice, and simplicity



Cloud Monitoring Capabilities

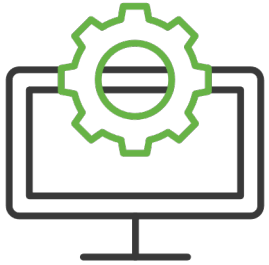
Centralized view of the entire network

Visibility of Cisco devices whether Meraki or Catalyst switches from one Dashboard



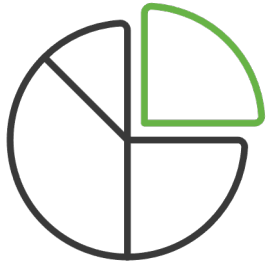
Real time switch and port health

Monitor Catalyst connectivity and health from the Dashboard



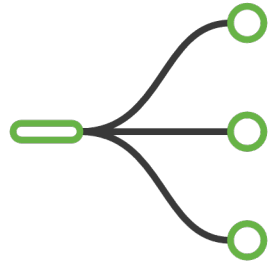
Remote monitoring

Powerful live troubleshooting tools for identifying and correcting issues, even from thousands of miles away



App visibility

Make it easy to understand how valuable network resources are being used. *(DNA Advantage License required for full feature set)*



Network topology

Monitor devices and their connections in a unified dynamically generated topology diagram

Supported Platforms and Software

Models
Catalyst
9200/L
9300/L/X
9500

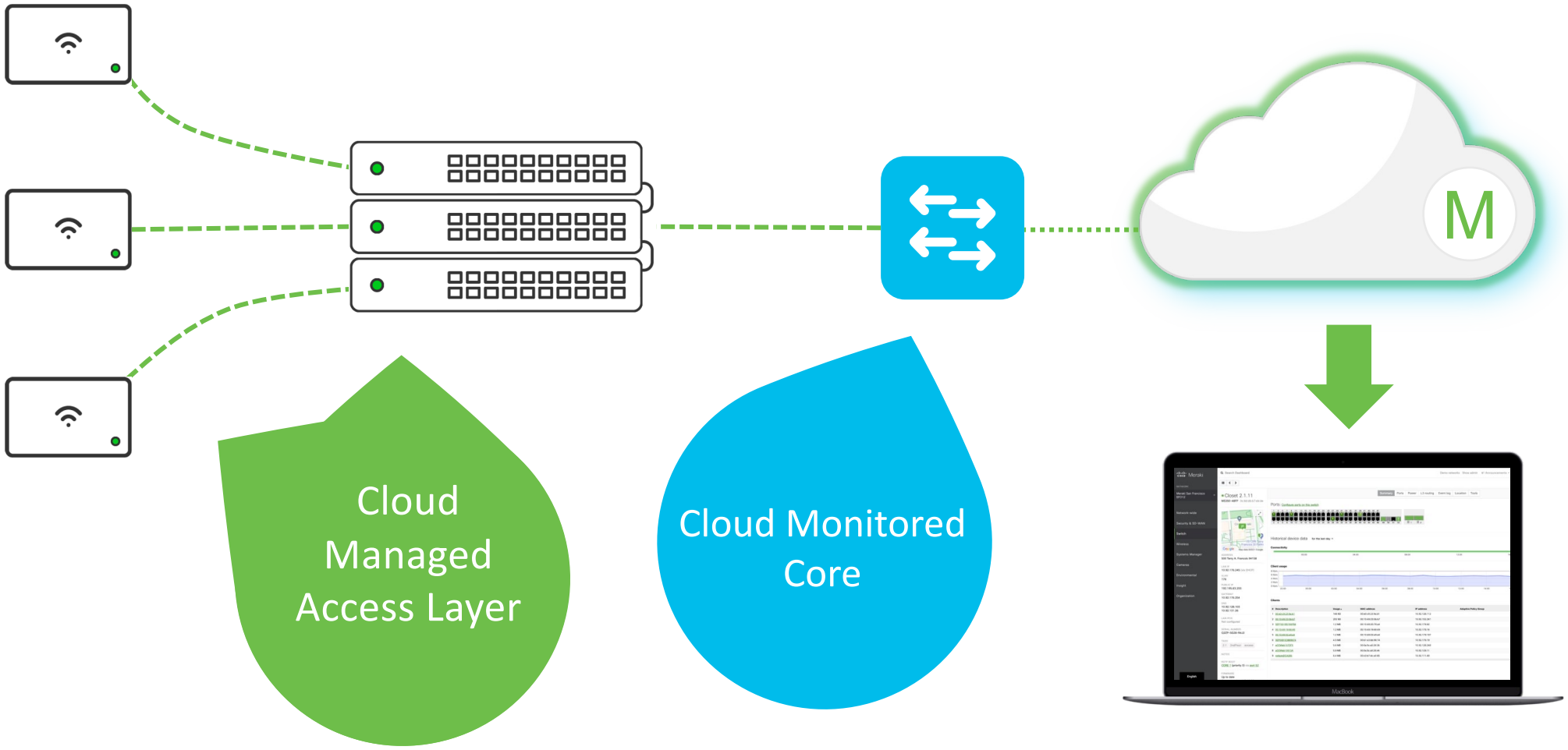
Firmware
IOS-XE 17.3+

Licensing
DNA Advantage
DNA Essentials*

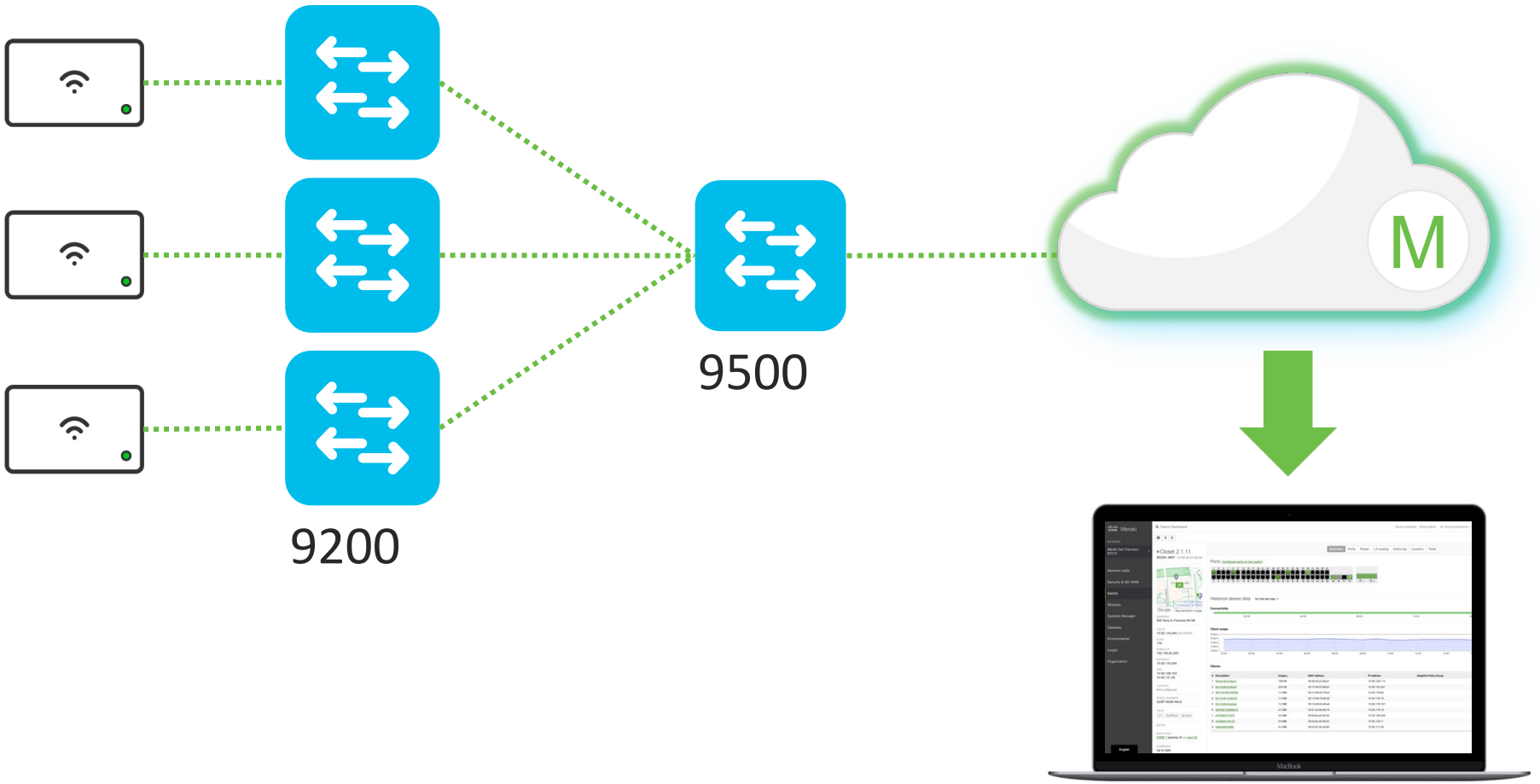
* DNA Essentials will not provide application or usage data

Architecture Use Cases

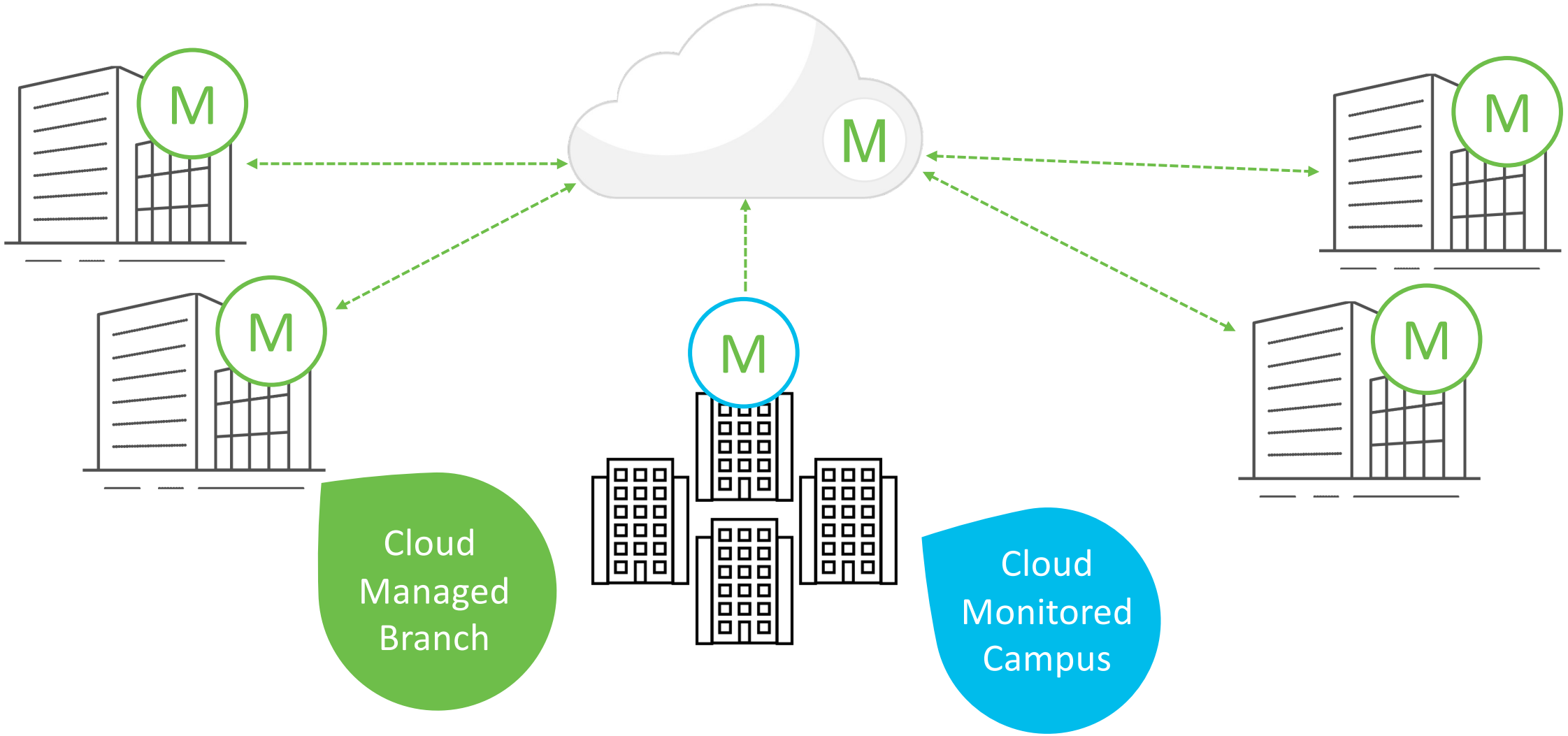
Tiered Architecture



Centralized Monitoring of Catalyst Networks



Catalyst Campus with Meraki Branches

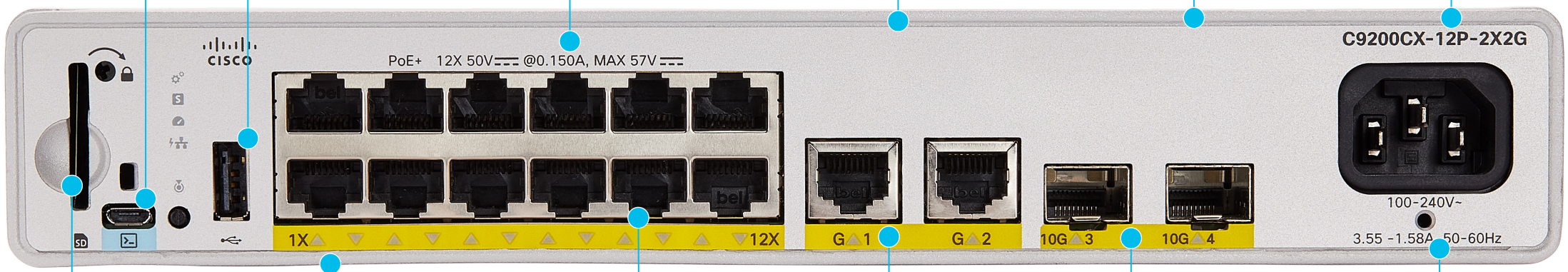


Demo!!

Cisco Catalyst 9200CX

IOS-XE 17.9.1

The New Catalyst 9200CX Compact Series Switches



*Bluetooth Dongle Support
(USB 2.0)

Console Port
(USB Type Micro-B)

Full POE+
Resiliency – Perpetual/Fast POE+

In-built Memory
4GB Memory
8GB Flash

Powerful and Light OS
IOS-XE Lite

Noiseless
Fanless Design

SD-Card Slot
16GB

Fast and Light ASIC
UADP 2.0 mini

Flexible downlink offering
8 port, 12 port

Copper Uplink Options
2x 1G Copper

Fiber Uplink Options
2x 1/10G SFP

Powering Options
310W Internal PS (PoE SKUs)
80W External PS (Data Only SKU)

* Hardware Capable

Catalyst 9000 Feature Richness Packed in a Compact Form Factor

Cisco Catalyst 9200CX Series

Next generation of compact access switches for intent-based networking

Security

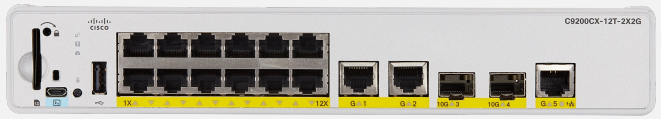
Resiliency

Application experience

9200 (Fixed Uplinks and Fanless)

Data

*Power via UPOE/UPOE+ Uplink!



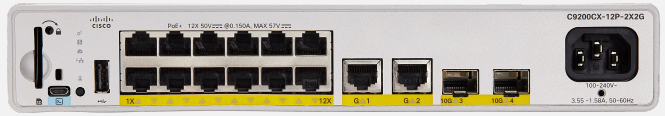
C9200CX-12T-2X2G

12x 1G Ports

802.3bt PD Port

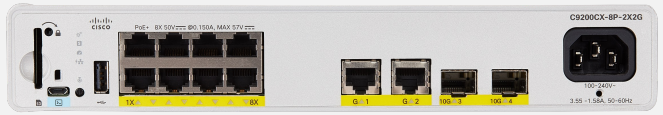
3 x 1G Copper and 2 x 1/10G SFP Uplinks

POE+



C9200CX-12P-2X2G

12x 1G Ports



C9200CX-8P-2X2G

8x 1G Ports

2 x 1G Copper and 2 x 1/10G SFP Uplinks

External PS on Data SKU
Fixed Internal PS on PoE+ SKUs

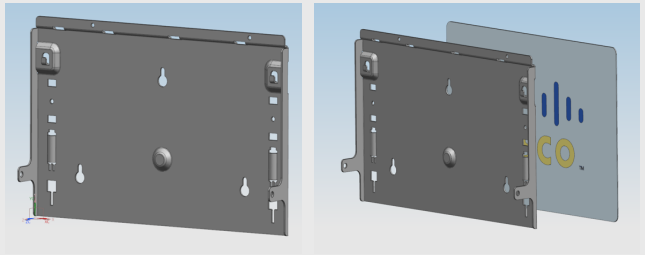
Cisco Catalyst 9200 Series Highlights
UADP 2.0 Mini
Cisco IOS XE Lite Software
SD-Access
MACsec-256 link encryption
Trustworthy solutions
Perpetual/Fast PoE
Programmability
Cold patching
Full Flexible NetFlow streaming telemetry

* Class 6 802.3bt (60W) minimum needed to power

All Uplink Ports can be simultaneously used. Providing maximum bandwidth when needed.

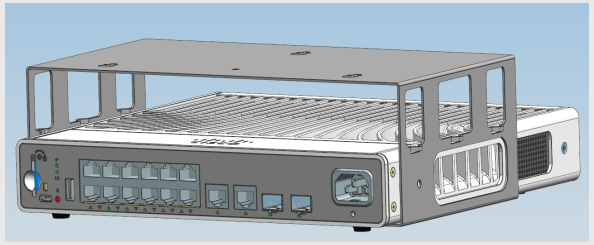
Catalyst 9200CX Mounting Options

Wall Mount
(C9K-WALL-TRAY)



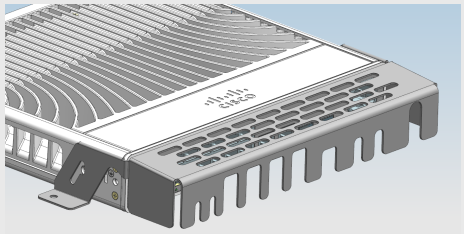
- With mounting tray and screws
- With mounting tray and magnet (in case of metal wall)

Table-Top/Bottom/Shelf Mount
(C9K-CMPCT-DESK-MNT)



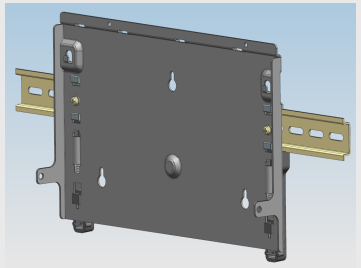
- With mounting tray and screws
- With mounting tray with magnet (in case of metal desk or shelf)

Rack Mount
(RACKMNT-19-CMPCT)



- With mounting screws

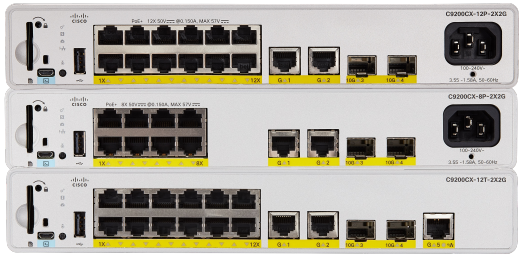
Din Rail Mount
(C9K-CMPCT-DIN-MNT)



- With a mounting tray and rail mount

Flexible mounting options for all mounting use-cases

Catalyst 9200CX – Next Generation Compact Switches



	Catalyst® 3560CX models		Catalyst® 9200CX models
Market-Leading Encryption	AES 128-Bit MACsec	+	AES 256-Bit MACsec
Network Visibility	Limited Flexible NetFlow	+	Full Flexible NetFlow
SD Bonjour Services	Not Available	+	Bonjour Service Peering*
Programmability	Basic Scripting with Python	+	YANG Models (RESTCONF, NETCONF, gNMI), ZTP
Application Visibility	Smart Logging, Limited Flexible Net Flow, and AVC	+	Streaming Telemetry (NETCONF Dial-In and gRPC Dial-Out) SD-AVC w/ NBAR2
SDA Fabric	SDA Extended Node Capability	+	SDA Edge Node Capability (16VNs)

innovations

Assurance w/ Cisco DNAC

Wired assurance, SD-Access, AVC, FNF

ETA, MACsec-256

Cisco TrustSec

*FCS++ Feature. Not Committed

Cisco Catalyst 9200CX Series

Powering Options for Data and PoE Models

1G Downlink and 1G/10G Uplink Models

Data SKU Powered w/ Power Adapter/UPOE+

C9200CX-12T-2X2G

12x1G Downlinks + (3x1G + 2x10G SFP+ Uplinks)

- External power adapter (80W)
- UPOE/UPOE+ powered*
- UPOE/UPOE+ Uplink also doubles as a 1G Copper

Power adapter

80W AC/DC External Power Adapter**

Powering Option	Available Power (W)
Auxiliary Input	80W
1 UPOE+ Uplink	71W
1 Class 6 802.3bt (60W)	51W

PoE+ SKUs Powered w/ Internal PS

C9200CX-12P-2X2G

12x1G Downlinks + (2x1G + 2x10G SFP+ Uplinks)

C9200CX-8P-2X2G

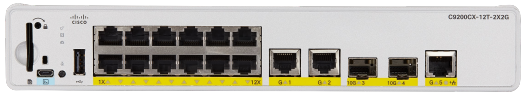
8x1G Downlinks + (2x1G + 2x10G SFP+ Uplinks)

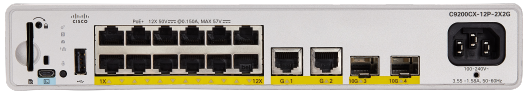
- 310W Internal AC power supply
- 240W PoE power budget
- Providing Type 2 Class 4 30W POE+ capability to all downlink ports

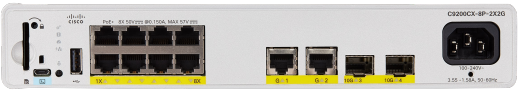
* Class 6 802.3bt (60W) minimum needed to power

** PID: PWR-ADP (AC-DC)
PID: C9K-ADPT-DC (DC-DC)

C9200CX Dimensions, Weight, and MTBF







	C9200CX-12T-2X2G	C9200CX-12P-2X2G	C9200CX-8P-2X2G
Chassis Dimensions (Inches)	1.73 x 10.6 x 6.5	1.73 x 10.6 x 9.6	1.73 x 10.6 x 9.6
Chassis Dimensions (Centimeters)	4.4 x 26.9 x 16.5	4.4 x 26.9 x 24.4	4.4 x 26.9 x 24.4
Weight (Pounds)	4.0	6.6	6.6
Weight (Kilograms)	1.81	2.99	2.99
MTBF (Hours)	755,270	553,140	569,530

Catalyst 9200CX Scale Enhancements

Forwarding Resources

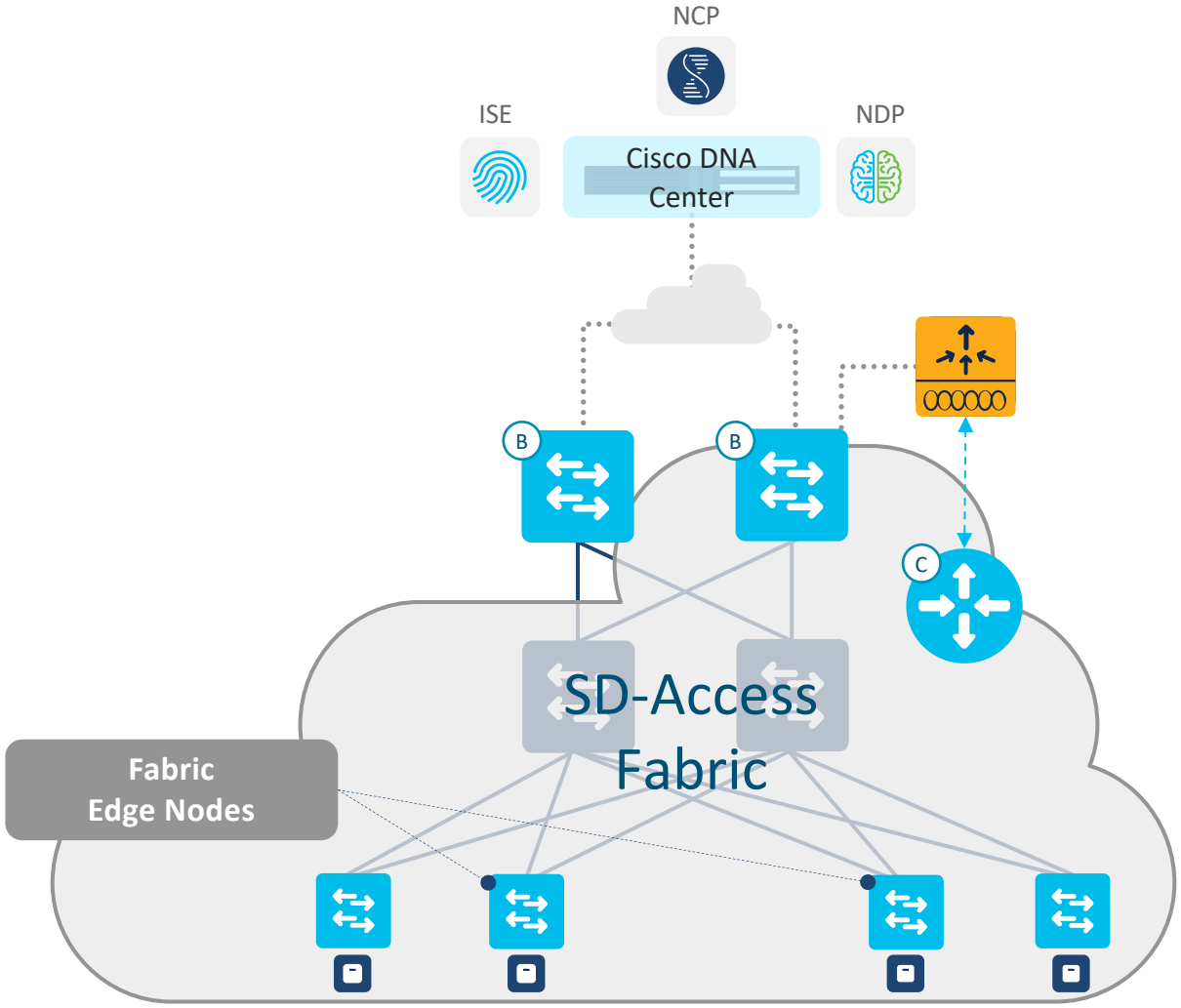
	C9200/CX	C3560CX
MAC	32k	16k
Host Route	10k	4k
IGMP Groups	1k	1k
Indirect Route	4k	1k
Multicast Route	1k	1k
SGT	2k	2k

Feature Resources

	C9200/CX	C3560CX
Security ACL • PACL • VACL • RACL	1k	375
QoS ACL	1k	375
NetFlow Entries	16k	8k

Higher Scale in the Same Form Factor

Fabric Edge Node for SD-Access



Fabric Edge Nodes – A fabric device that connects wired endpoints to the SD-Access Fabric

Provides first-hop services for Users/Devices connected to a fabric

Supports:

- LISP
- VxLAN

Scale:

	C9200CX
Number of User VRFs	16

Trustworthy solution

Catalyst 9200CX Series switches provides strong resistance against today's threats

HW Anchored Secure Boot

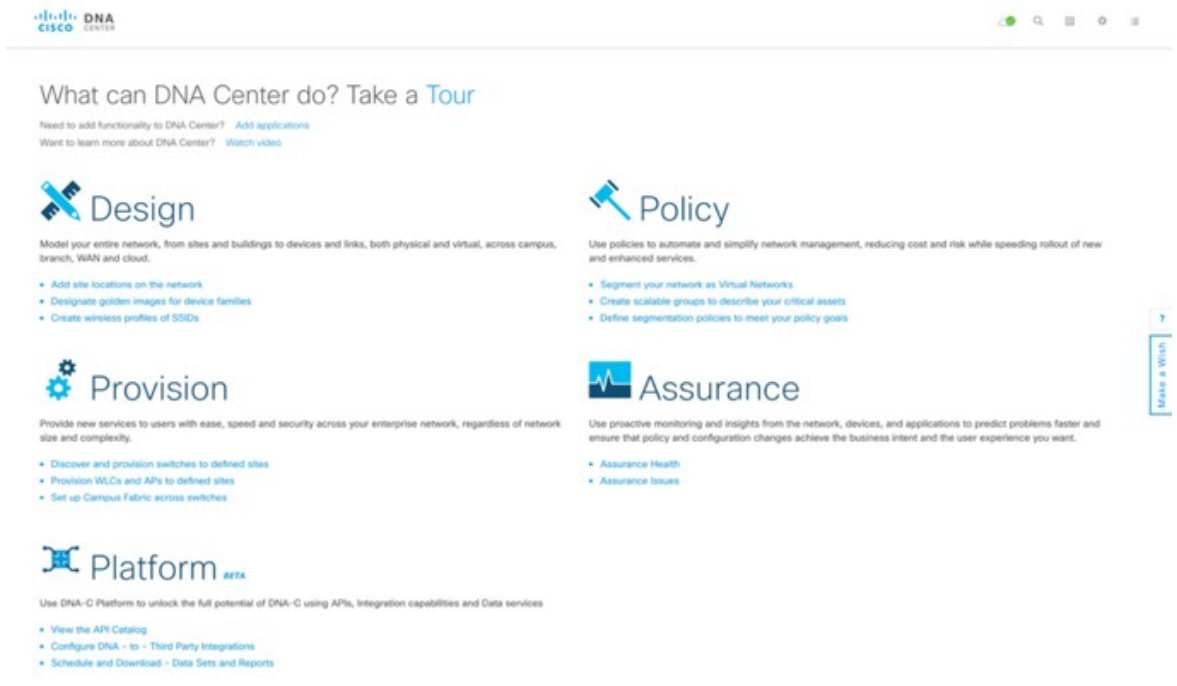
Image Signing and Secure Boot work together to ensures that authentic Cisco SW boots up on a Cisco Platform

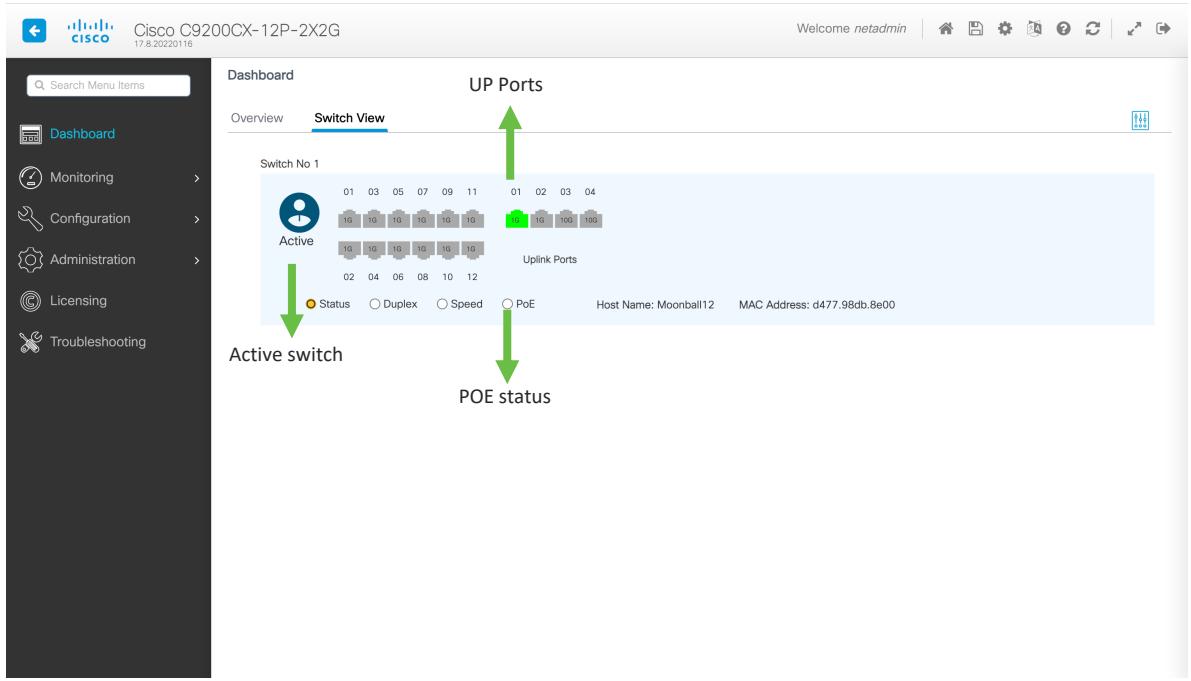
Trust Anchor Module

HW Authenticity Check

Secure Unique Device Identification

Tamperproof ID for the device



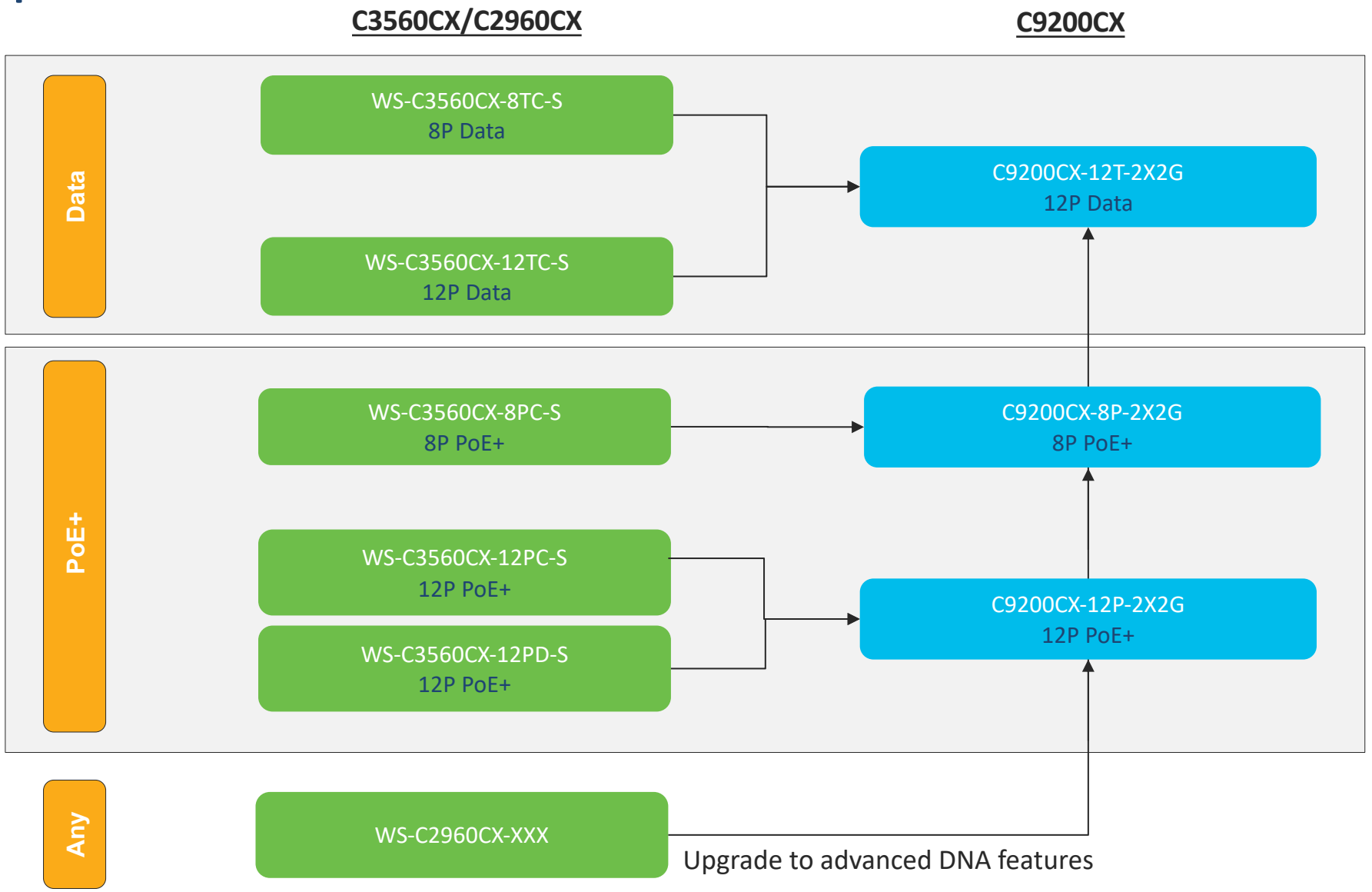


DNAC
Part of the Larger Network

WebUI
Small Branch - CPC Migration

Catalyst 9200CX can be Managed Multiple Ways

Compact Product Transitions



Catalyst Wireless

Wi-Fi 6E access points

Cloud managed wireless for any workspace

CW9166

Flex radio for 5Ghz capacity today and 6E speed tomorrow

Available

CW9164

Dedicated 6Ghz radio for performance anywhere

Available

CW9162

6E spectrum to power hybrid work in the branch

Order Oct

Choice of management: Meraki or Cisco DNA Center

One Product – Two personas

DNA **Persona**
C9800 & DNAC Stack

Meraki **Persona**
MR Dashboard Stack

Conversion overview

Done from C9800 WLC

Call Meraki Support

Cisco Wi-Fi 6E Portfolio

Common Platforms will have CW PIDs

MR and C series APs are not convertible

CW9162

- 2x2, 2x2, 2x2
- 2.5 Gbps mGig
- Power Options: PoE, DC Power
- Scanning Radio
- IoT ready + Bluetooth 5.x
- Standard Bracket

CW9164

- 2x2, 4x4, 4x4
- 2.5 Gbps mGig
- Power Options: PoE,
- DC Power
- Scanning Radio
- IoT Ready + Bluetooth 5.x
- Standard Bracket

CW9166

- 4x4, 4x4, 4x4 (XOR 5/6)
- 5 Gbps mGig
- Power Options: PoE, DC Power
- IoT ready + Bluetooth 5.x
- Scanning Radio
- Environmental Sensor
- Common XOR Architecture
- Standard Bracket

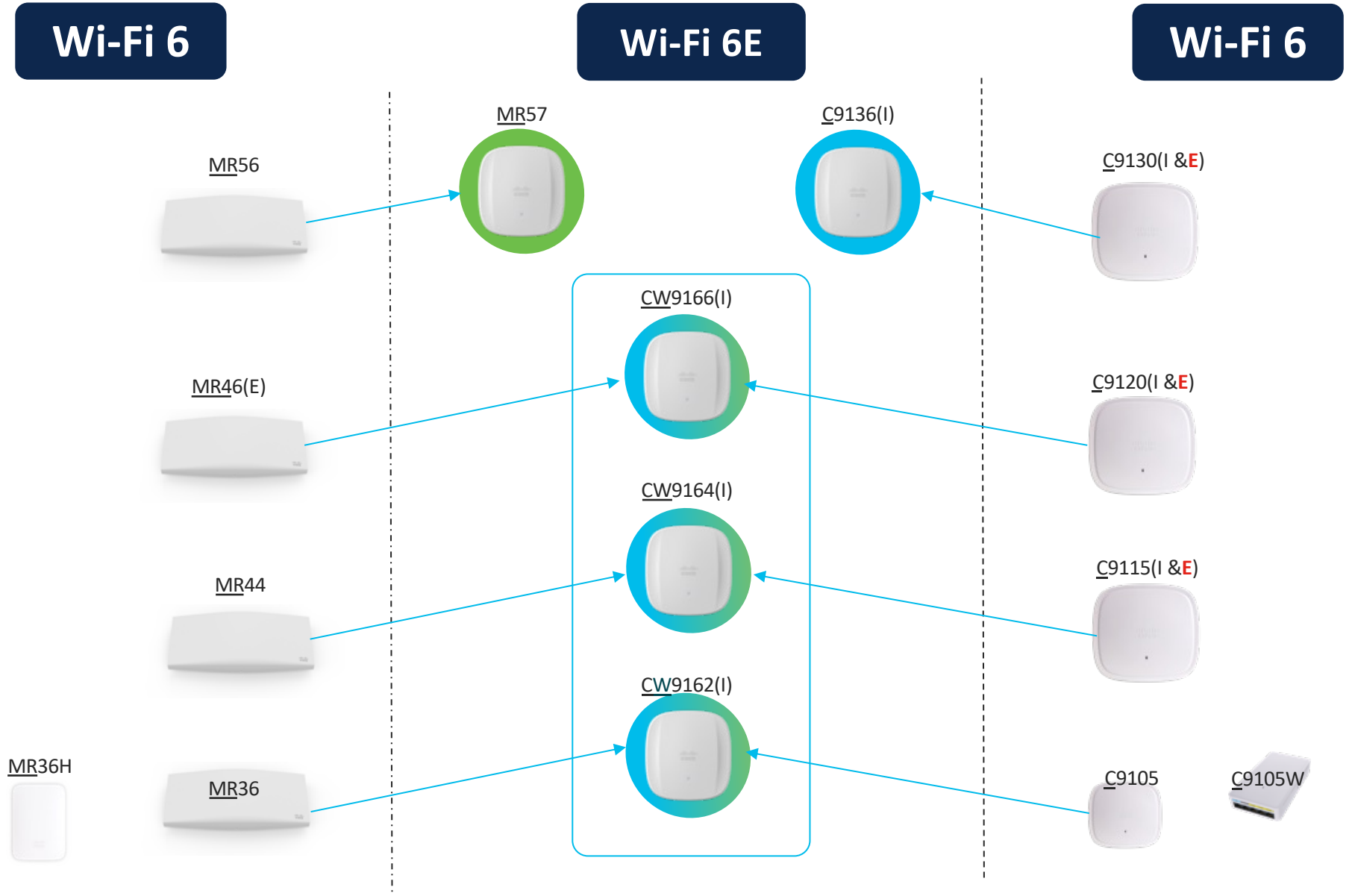
MR57

- 4x4 + 4x4, 4x4 (XOR 5/6)
- Dual 5 Gbps mGig with failover
- Power Options: PoE, DC Power
- IoT ready + Bluetooth 5.x
- Scanning Radio
- XOR Architecture (High/Low band)
- Standard Bracket

C9136

- 4x4 + 8x8 + 4x4 or 4x4+4x4+4x4+4x4
- Dual 5 Gbps mGig with failover
- Power Options: PoE, DC Power
- IoT ready + Bluetooth 5.x
- Scanning Radio
- Environmental Sensor
- XOR Architecture (macro/meso)
- Standard Bracket

Wi-Fi 6 & Wi-FI 6E Co-Existence



Industry's best and broadest Wi-Fi 6E and Wi-Fi 6 portfolio

6E

9162

9164

9166

9136

6

9105I/W

9115

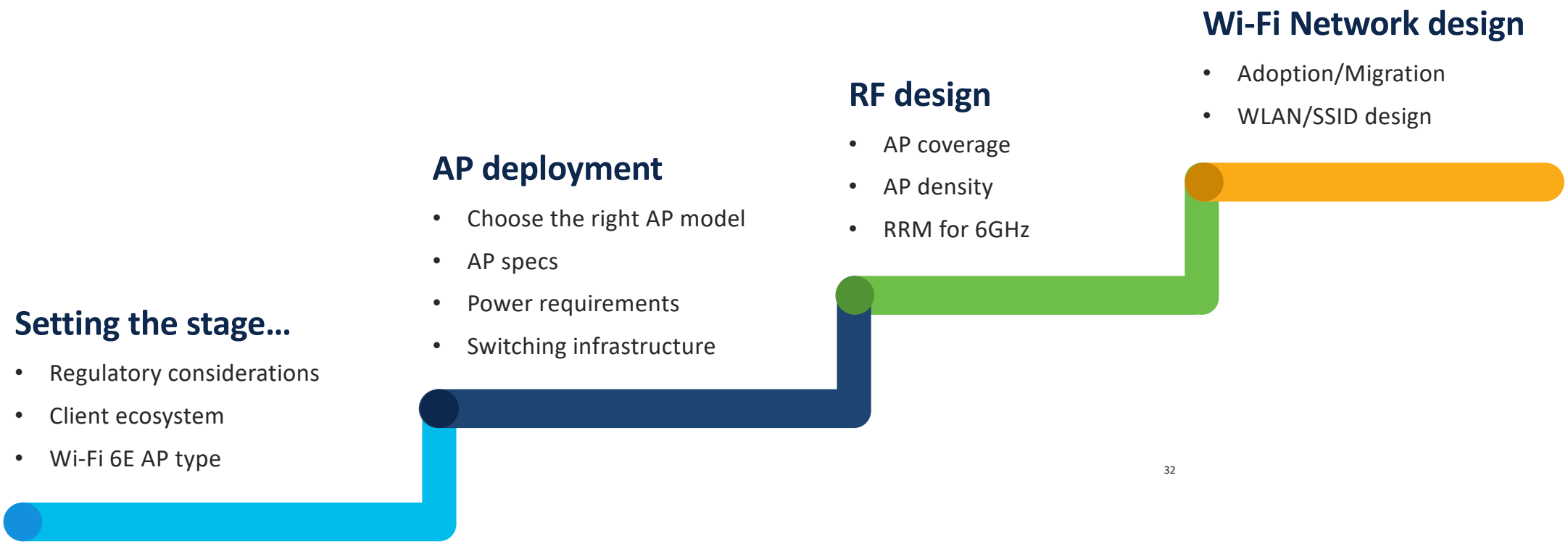
9120

9130

9124

WiFi 6E nasazení

Are you Ready for Wi-Fi 6E?



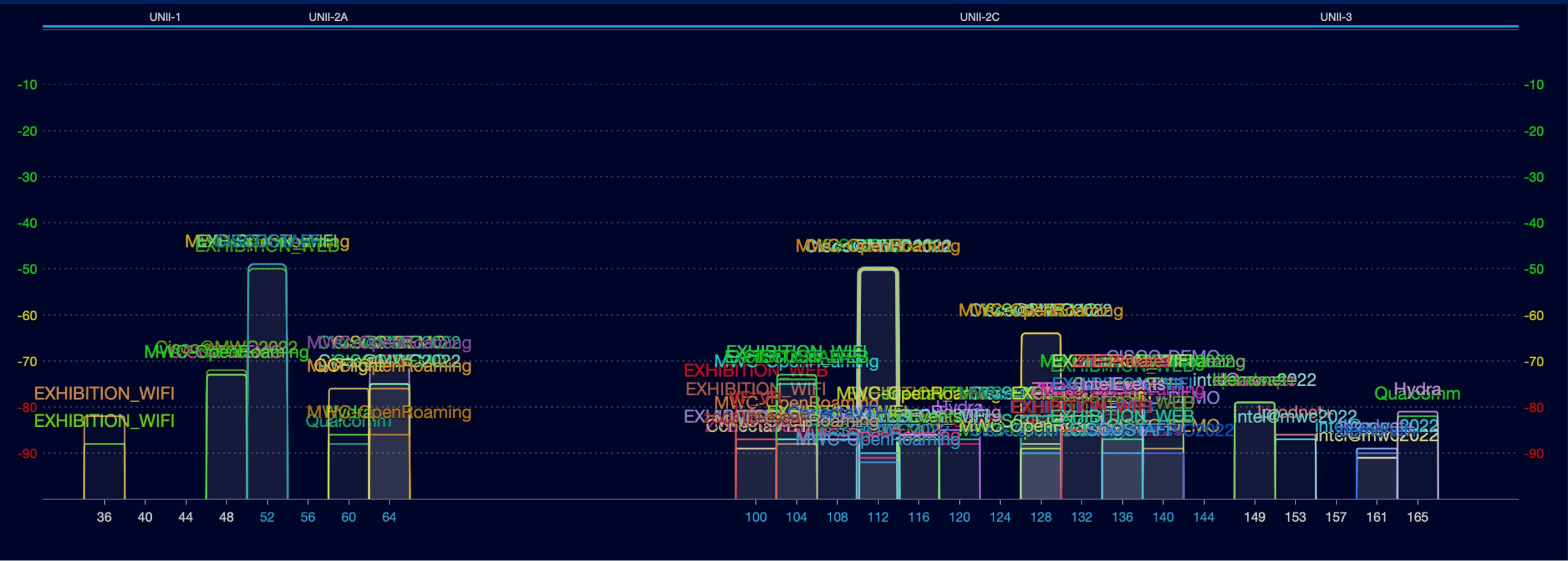
Are you Ready for Wi-Fi 6E?

Setting the stage…

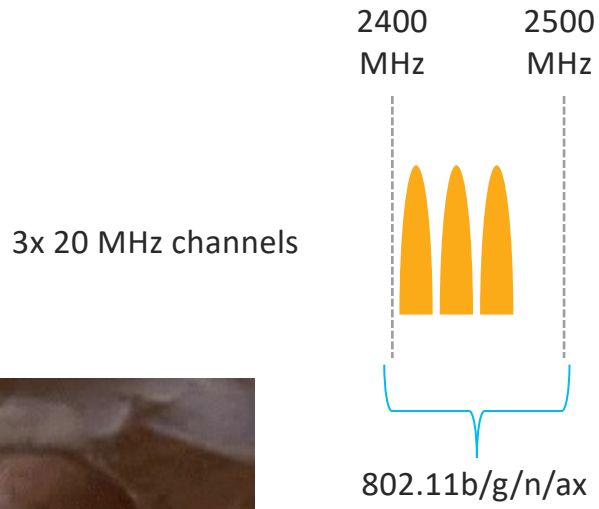
- Regulatory considerations
- Client ecosystem
- Wi-Fi 6E AP type

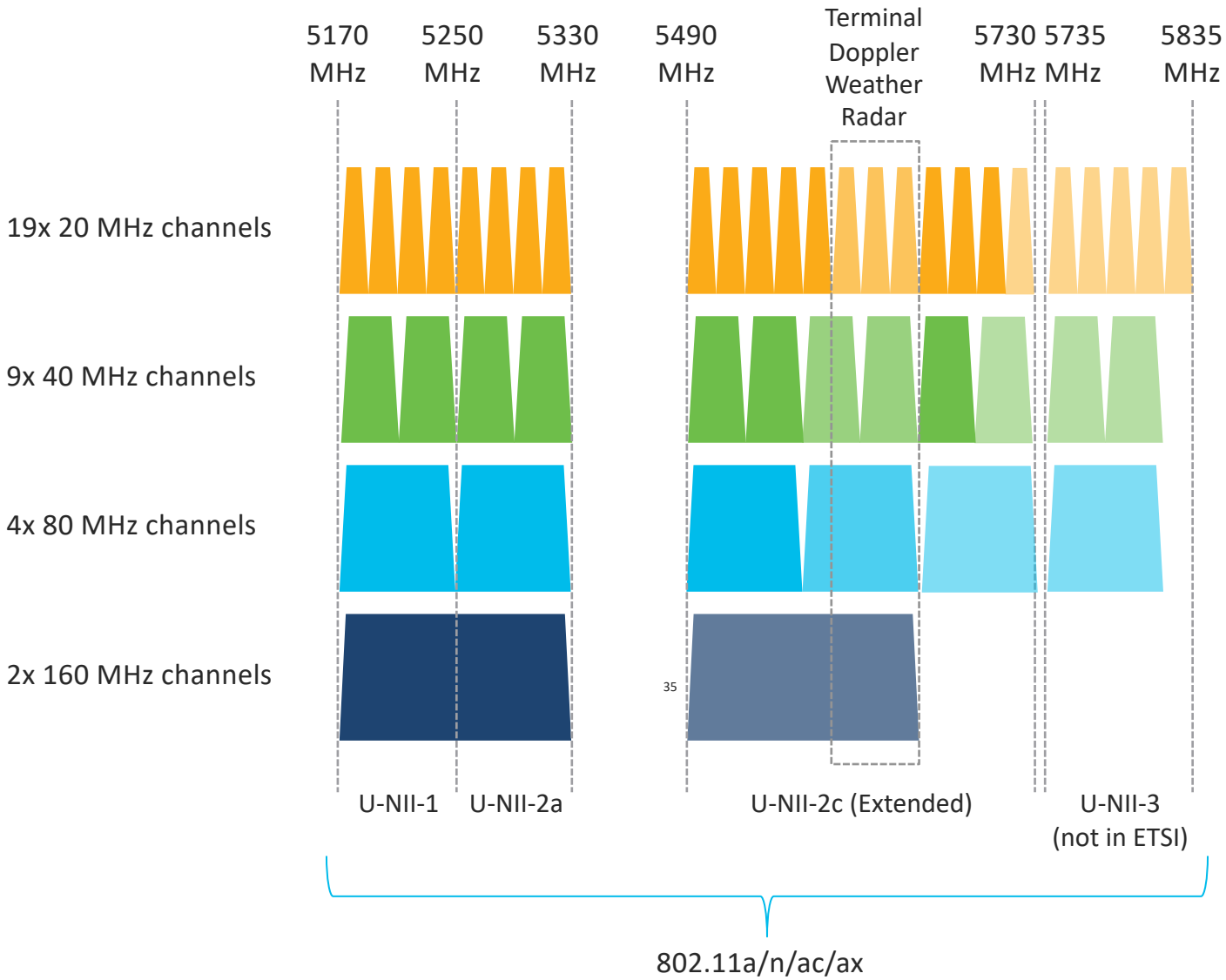
What is the Problem?

- Existing 2.4 GHz and 5 GHz spectrum is congested
- Legacy clients
- No way to use 80 or 160 MHz channels



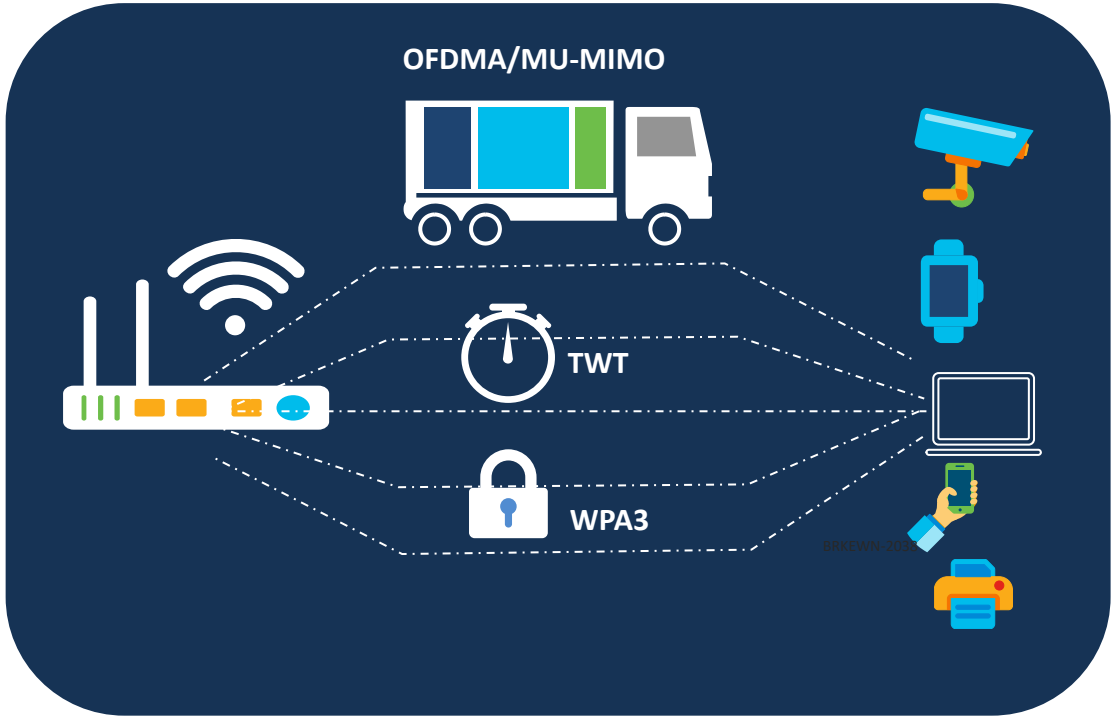
The 2.4 GHz and 5 GHz bands today

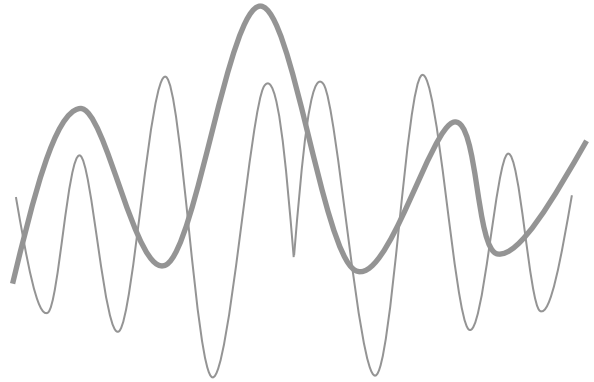




6E =

Extending the Capabilities of Wi-Fi 6 to clean 6GHz spectrum

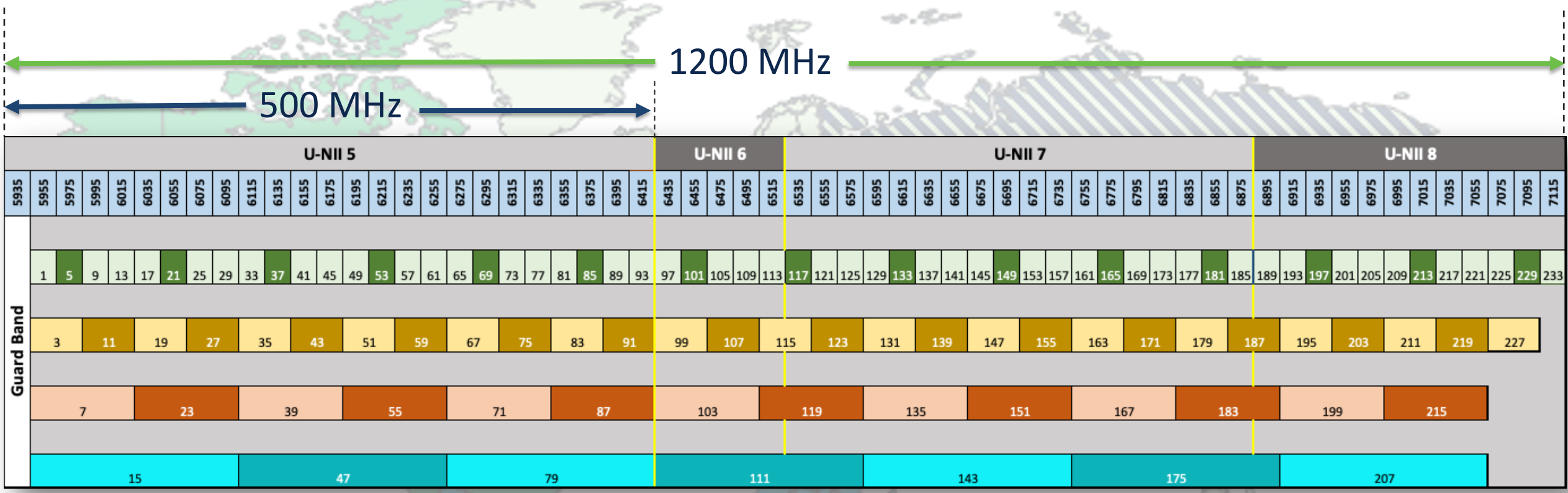




- ✓ 1200 MHz spectrum
- ✓ Greenfield 6GHz band!
- ✓ No legacy devices
- ✓ No DFS (for radar)
- ✓ Legacy Interference Free!

Orthogonal frequency-division multiple access (OFDMA)
Multiple User, Multiple Input, Multiple Output (MU-MIMO)
Target Wait Time (TWT)
Wi-Fi Protected Access v3 (WPA3). | GHz = gigahertz
Dynamic Frequency Selection (DFS). |. MHz = megahertz

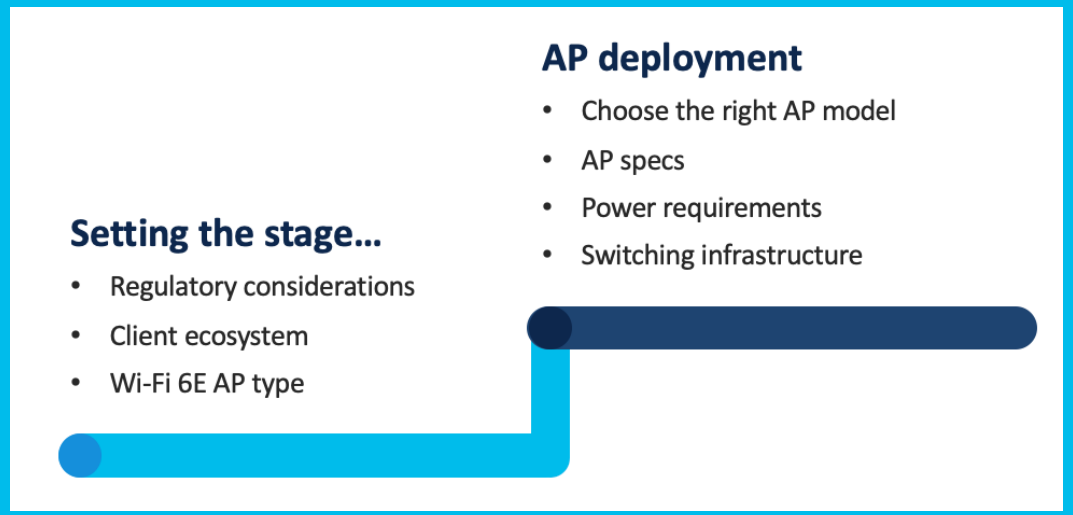
The new 6 GHz band – Channel Numbering



Channel Width:

- 20 MHz
- 40 MHz
- 80 MHz
- 160 MHz

AP Deployment



6 GHz – New Device Classes

- Wi-Fi 6E introduces new device classes for optimized capability
- Regulations vary by country

Low Power Indoor (LPI) AP

- Indoor Only
- Integrated Antenna Required
- Can use the full 1200 MHz
- Wired Power

Standard Power (SP) AP

- Indoor or Outdoor
- Integrated or External Antenna
- UNII-5 and UNII-7 Only (US)
- No support in ETSI
- Requires AFC*

(*) Automatic Frequency Co-ordination

Very Lower Power (VLP) AP

- Mobile Indoor or Outdoor
- Limited Range
- Does not require AFC*

Client Devices

- Indoor or Outdoor
- Only Indoor under control of LPI AP
- 6 dBm lower power than AP for FCC
- Same power of AP in ETSI

Cisco Catalyst Wireless (CW) 6E Access Points

Ideal for Small to Medium-sized deployments › Best In Class, Flexibility › Mission Critical, Performance

CW9162*

- 2x2 + 2x2 + 2x2
- 2.5 Gbps mGig
- Power: PoE, DC Power
- IoT ready + Bluetooth 5.x
- iCAP for Management Frames
- USB – 4.5 W

(*) Available with IOS-XE 17.9.2

CW9164

- 2x2, 4x4, 4x4
- 2.5 Gbps mGig
- Power: PoE, DC Power
- IoT Ready + Bluetooth 5.x
- iCAP for Management Frames
- USB- 4.5 W

CW9166

- 4x4 + 4x4 + 4x4 (XOR 5/6)
- 5 Gbps mGig
- Power: PoE, DC Power
- IoT ready + Bluetooth 5.x
- USB – 4.5W
- Full Packet Capture (iCAP)
- Environmental Sensor
- Zero-Wait DFS*

C9136

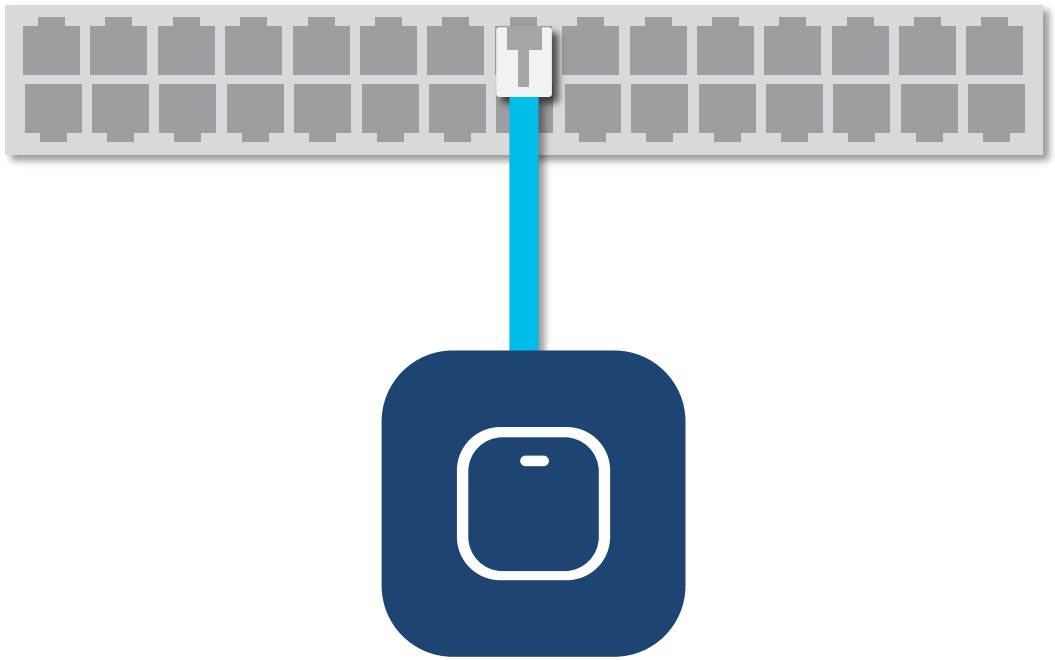
- 4x4, 8x8, 4x4 /4x4, 4x4+4x4, 4x4
- Dual 5 Gbps mGig
- Power: PoE only
- IoT ready + Bluetooth 5.x
- Environmental Sensor
- PoE and Link Redundancy
- Full Packet Capture (iCAP)
- Zero-Wait DFS*
- USB – 9W

**Available in Future*

Full radio capability (6 GHz @ LPI) on single 30W PoE+

Dedicated Radio for CleanAir Pro | Same Brackets | Same Industrial Design | AP Power Optimization

Catalyst AP to Switch connection



AP negotiates power, speed and duplex at boot time via CDP/LLDP

MGig switchport is recommended as Wi-Fi 6/6E speed may exceed 1 Gbps

Cabling: Cat 6/6A recommended. Cat 5e can support up to 5Gbps

CDP = Cisco Discovery Protocol
LLDP = Link Layer Discovery Protocol
Cat = Category (of ethernet cable)

Catalyst CW9164 Power over Ethernet

- Default Configuration (Fixed Power profile)

Power Source	Number of Spatial Stream	2.4 GHz Radio	5 GHz Radio	6 GHz Radio	mGig Link Speed	USB	AI/ML Driven Scanning Radio
802.3af	n.a.	Disabled	Disabled	Disabled	1G	Disabled	Y
802.3at	10	2x2	4x4	4x4	2.5G	Disabled	Y
802.3bt	10	2x2	4x4	4x4	2.5G	Y/4.5 W	Y
DC Power	10	2x2	4x4	4x4	2.5G	Y/4.5 W	Y

Note:

1. AIR-PWRINJ7 is C9164I's official 802.3bt Power Injector
2. Actual Power Draw data will be available later (as final testing is in progress)

USB = universal serial bus
AI = Artificial Intelligence
ML = Machine Learning

Catalyst CW9166 Power over Ethernet

- Default Configuration (Fixed Power profile)

Power Source	Number of Spatial Stream	2.4 GHz Radio	5 GHz Radio	5 GHz /6 GHz Radio (LPI)	mGig Link Speed	USB	AI/ML Driven Scanning Radio
802.3af	n.a.	Disabled	Disabled	Disabled	1G	Disabled	Y
802.3at	12	4x4	4x4	4x4	5G	Disabled	Y
802.3bt	12	4x4	4x4	4x4	5G	Y/4.5 W	Y
DC Power	12	4x4	4x4	4x4	5G	Y/4.5 W	Y

Note:

1. AIR-PWRINJ7 is C9166I's official 802.3bt Power Injector
2. Actual Power Draw data will be available later (as final testing is in progress)

Catalyst 9136I Power over Ethernet

- Default Configuration (Fixed Power profile)

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	AI/ML-driven scanning radio	Env. sensors	Max power draw
802.3af (PoE)	0	Disabled	Disabled		Disabled	1G	Disabled	Disabled	Y	Y	14W
802.3at (PoE+)	8	2x2	**4x4**	Disabled	**2x2**	2.5G	2.5G (Standby)	Disabled	Y	Y	24.4W
802.3bt (UPOE)	16	4x4	8x8 or dual 4x4		4x4	5G	5G	Yes/9W	Y	Y	47.3W

Note:

1. Slot 2 can operate only together with slot 1 in 8x8 mode. Independent slot 2 operation is not supported until a future software release.
2. AIR-PWRINJ7 is the 9136I's official 802.3bt power injector.

PHY = Physical layer
PoE = Power over Ethernet
UPoE = Universal Power over Ethernet

RF Design

Setting the stage...

- Regulatory considerations
- Client ecosystem
- Wi-Fi 6E AP type

AP deployment

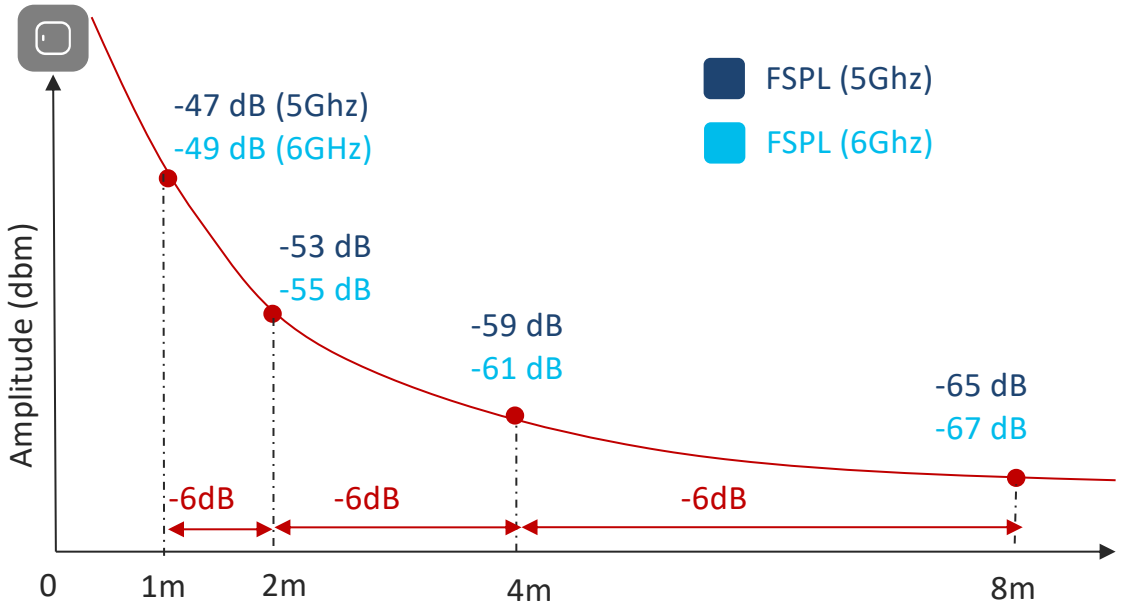
- Choose the right AP model
- AP specs
- Power requirements
- Switching infrastructure

RF design

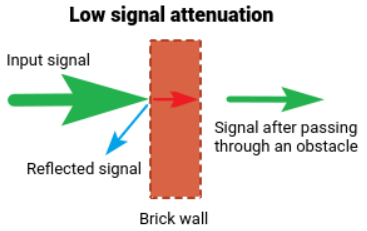
- AP coverage
- AP density
- RRM for 6GHz

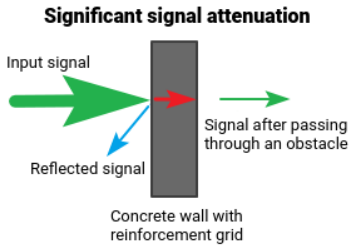
What you need to consider?

- 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



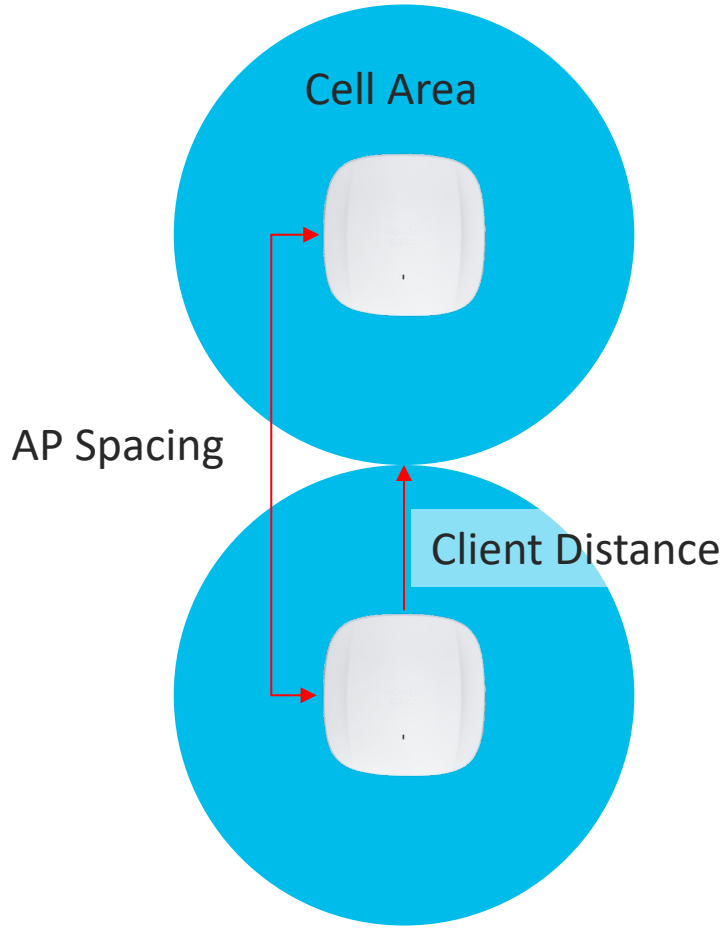


(*) FSPL = Free Space Path Loss: https://en.wikipedia.org/wiki/Free-space_path_loss

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

Dimensioning 5 GHz

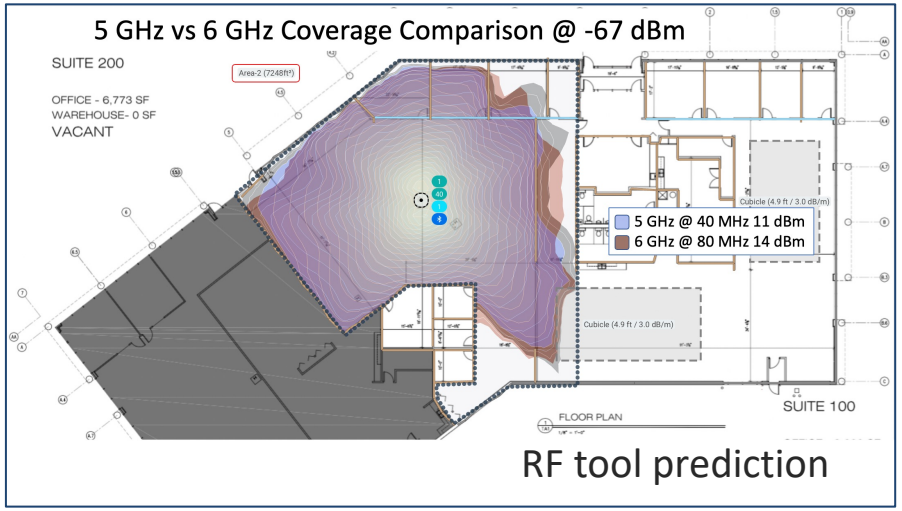
Cell Area/Coverage	AP Spacing 1 AP every	Max Client Distance to AP
1k ft^2/92m^2	36 f /11 m	18 f / 5.5 m
1.2k ft^2/111m^2	40 f /12 m	20 f / 6 m
1.5k ft^2/140 m^2	44 f /13.5 m	22 f / 6.7 m
2K ft^2/185 m^2	50 f /15.2 m	25 f / 7.6 m
2.8K ft^2/260 m^2	60 f /18.2 m	60 f / 18.2 m



For more information on channel planning and AP density see:
Cisco High Density AP/Deployment
https://www.youtube.com/watch?v=c8w6Mfck0nQ

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



RF tool prediction

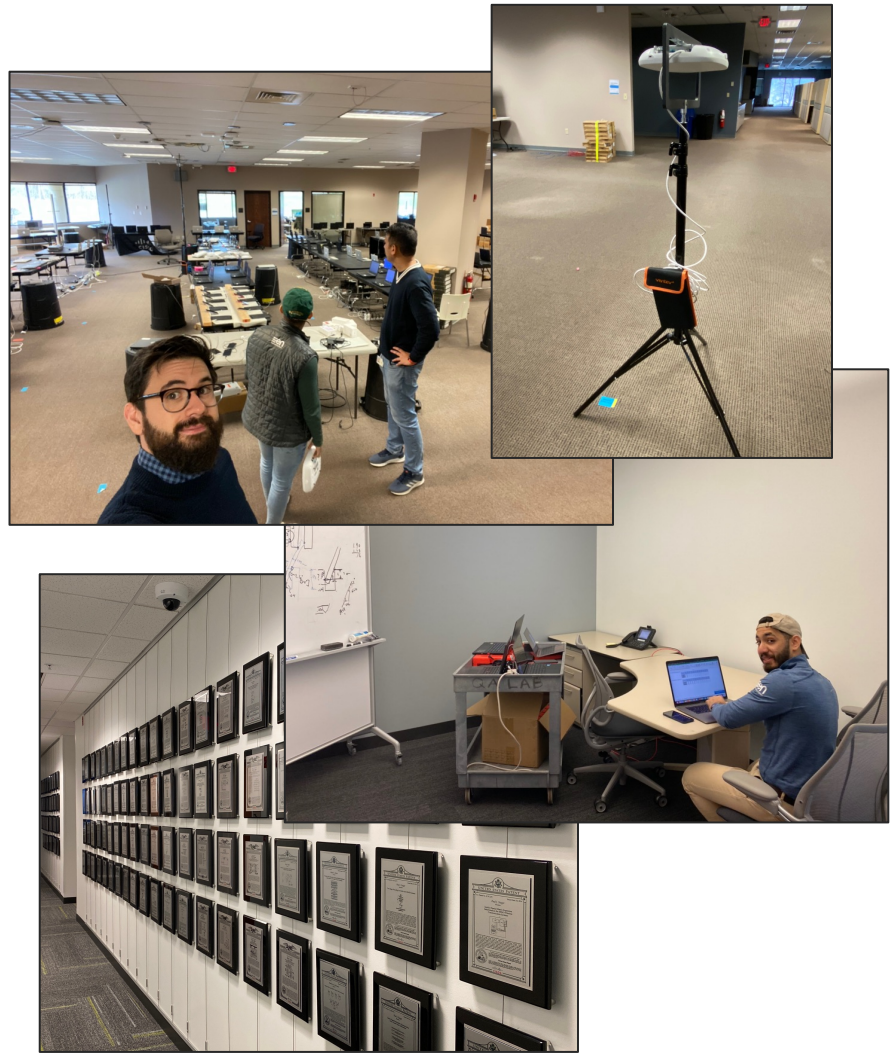
5GHz @40 MHz 11dbm

6GHz @80 MHz 14 dbm

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

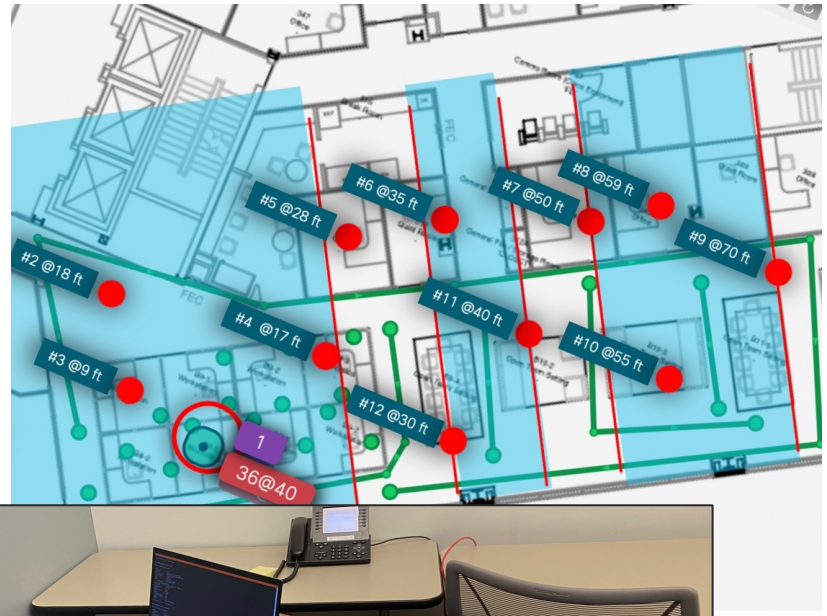
What we Tested

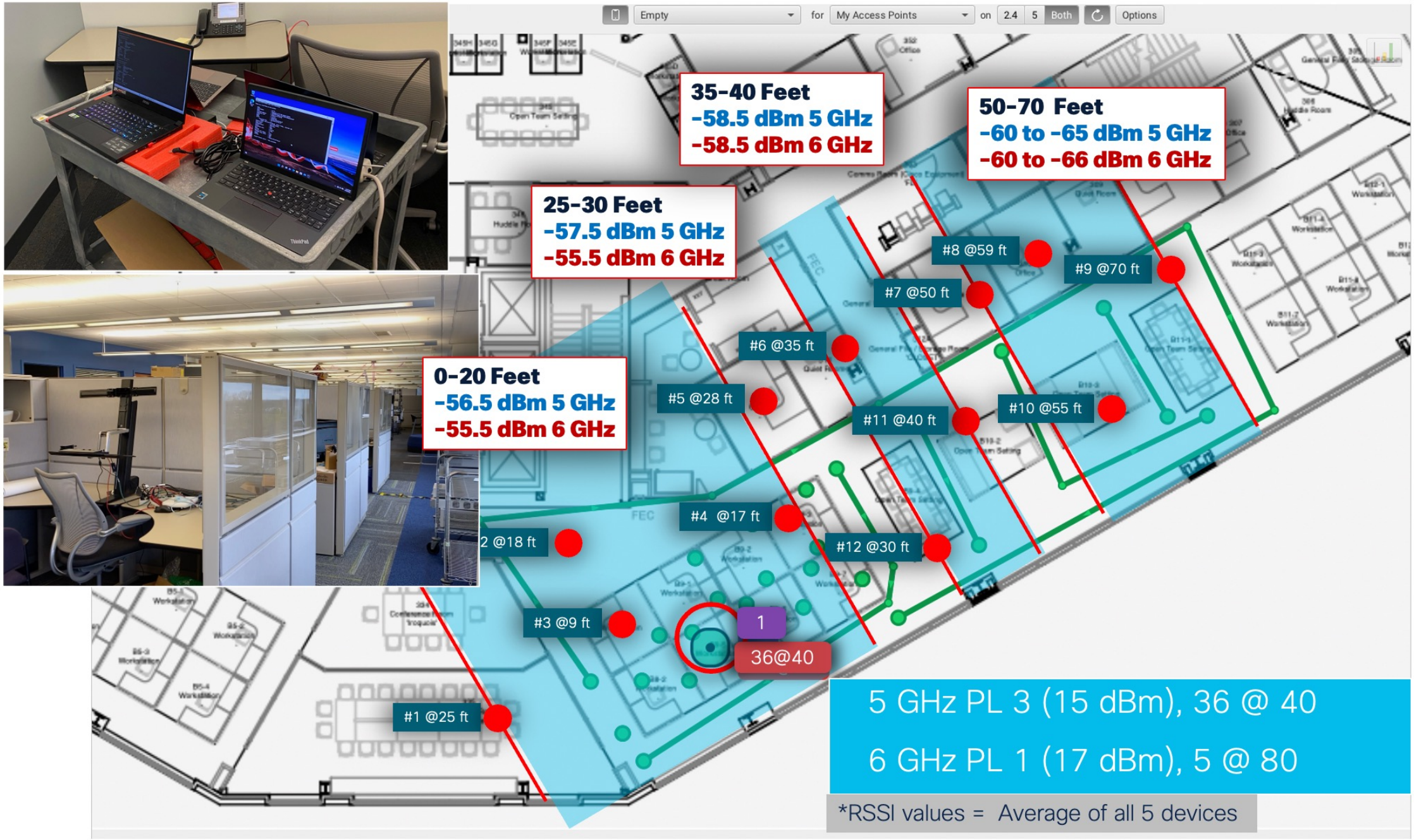
1. Propagation for 6 GHz as it compares to 5 GHz propagation
   - Use clients to record RSSI @ 5 and 6 GHz measuring at 12 points across the Richfield, OH Cisco offices
   - Compare 5 GHz and 6 GHz readings from the same device at each point
   - Compare Ekahau Site Survey/sidekick values
2. Range vs Rate testing for 5 GHz vs 6 GHz
   - Compare 5 vs 6 GHz implementation on Various clients
   - Demonstrate effectiveness of a practical coverage plan



1. Propagation Comparison 5/6 GHz

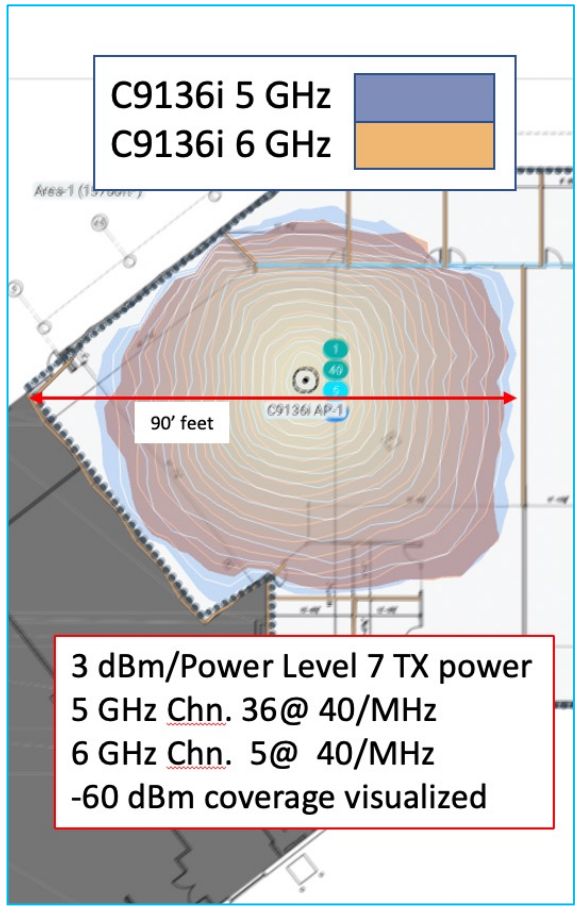
- Multiple Test Points 1-12 with 5 Tri band Client Devices
  - 1 Lenovo, 2x Samsung and 1 MSI Laptops
  - Samsung S-21 Phone
- Record and Compare Measurements between clients @ both 5 and 6 GHz
- Compare 5 GHz Measurements with Ekahau site survey
  - Validate Survey vs Client observation
  - Ekahau Sidekick – Mobile Device mode




Empty
for
My Access Points
on
2.4
5
Both
Options
35-40 Feet
-58.5 dBm 5 GHz
-58.5 dBm 6 GHz
50-70 Feet
-60 to -65 dBm 5 GHz
-60 to -66 dBm 6 GHz
25-30 Feet
-57.5 dBm 5 GHz
-55.5 dBm 6 GHz
0-20 Feet
-56.5 dBm 5 GHz
-55.5 dBm 6 GHz
#8 @59 ft
#9 @70 ft
#7 @50 ft
#6 @35 ft
#5 @28 ft
#11 @40 ft
#10 @55 ft
#4 @17 ft
#12 @30 ft
#3 @9 ft
1
36@40
#1 @25 ft
5 GHz PL 3 (15 dBm), 36 @ 40
6 GHz PL 1 (17 dBm), 5 @ 80
*RSSI values = Average of all 5 devices

Coverage and Planning Conclusions

- Tx Power can be used at 5 and 6 GHz to balance coverage between co-resident 5 and 6 GHz Cells on the C9136
- Using a 1.2K to 2K f^2 (110-185 m^2) per AP 5 GHz AP positions or plan a user can expect to provide equal coverage @ 6 GHz if configured properly
- Ekahau SideKick 5 GHz measurement's, displayed in Mobile Device mode provided accurate if conservative measurements compared to the actual clients

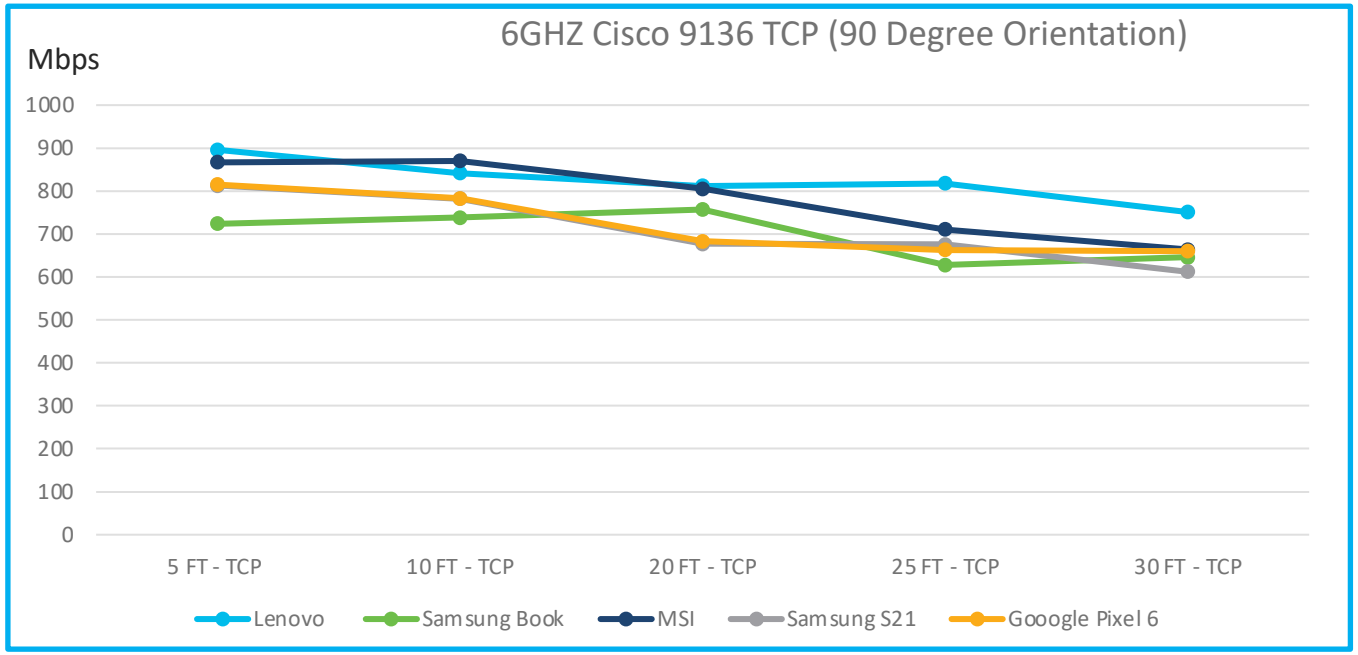


2. Range vs Rate Performance

- At Enterprise densities (1.2-2K f^2) Cell boundary is ~25 Feet max from AP
- Testing 5 clients TCP throughput @ 5 and 6 GHz
- Test Range uses Cisco C9136 –B configured for 5 GHz PL 3, chn 36@40 and 6 GHz PL1, chn 5@80
- Data gathered at 5,10,20,25, and 30 foot distances from the AP
- All devices 2ss @ 5 and 6 GHz

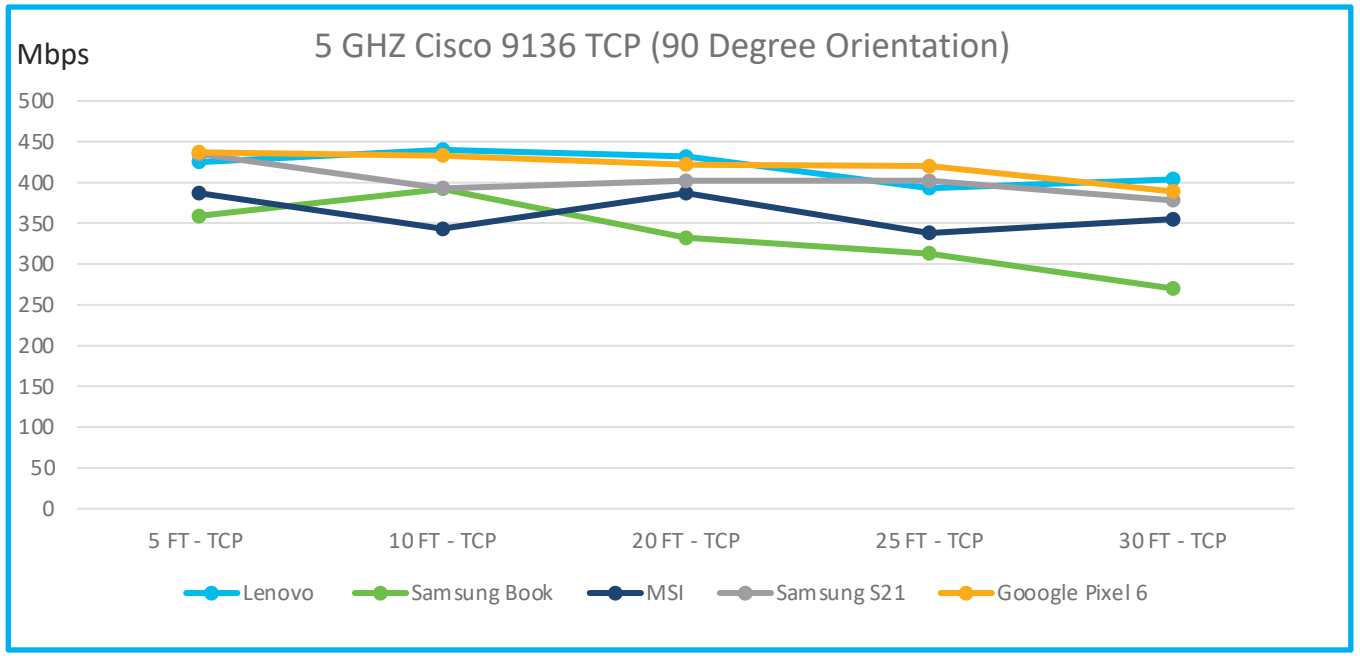
Test Results at 6 GHz

- Clients included Lenovo, Samsung Book, MSI Laptops and Samsung S21 and Google Pixel 6 Smart Phones
- Throughput was between 600 and 900 Mbps across the distance range
- Avg 20% throughput degradation between the near and far end of the range



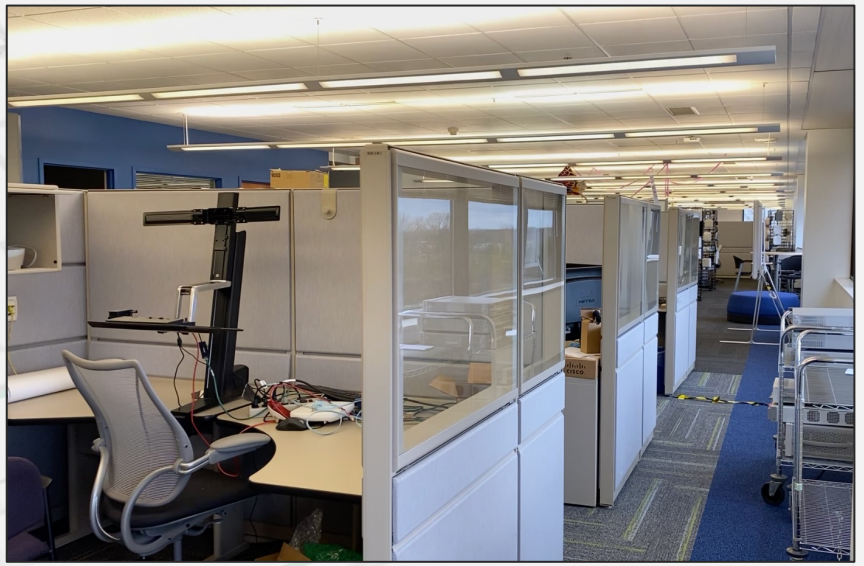
Test Results at 5 GHz

- At 5 GHz with 40 MHz cells
- Throughput was between 270 and 435 Mbps across the distance range
- Avg 13% throughput degradation between the near and far end of the range

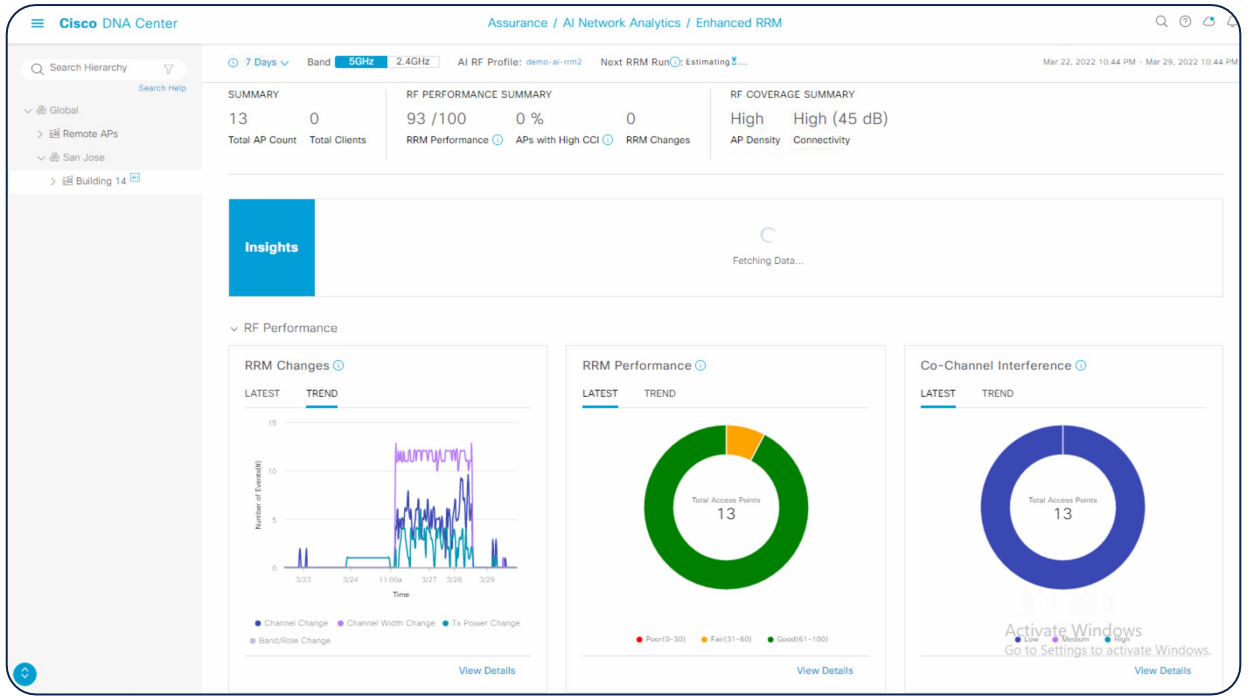


RF Design considerations

- 1:1 AP replacement for brownfield, assuming:
  - Cell size 1500/2000 ft^2 (140 - 190 m^2) with 10 ft. (3 m) ceiling height
  - Power levels of 11-15 dBm in 5 GHz > power can easily be adjusted upward for 6 GHz to match 5GHz cell coverage

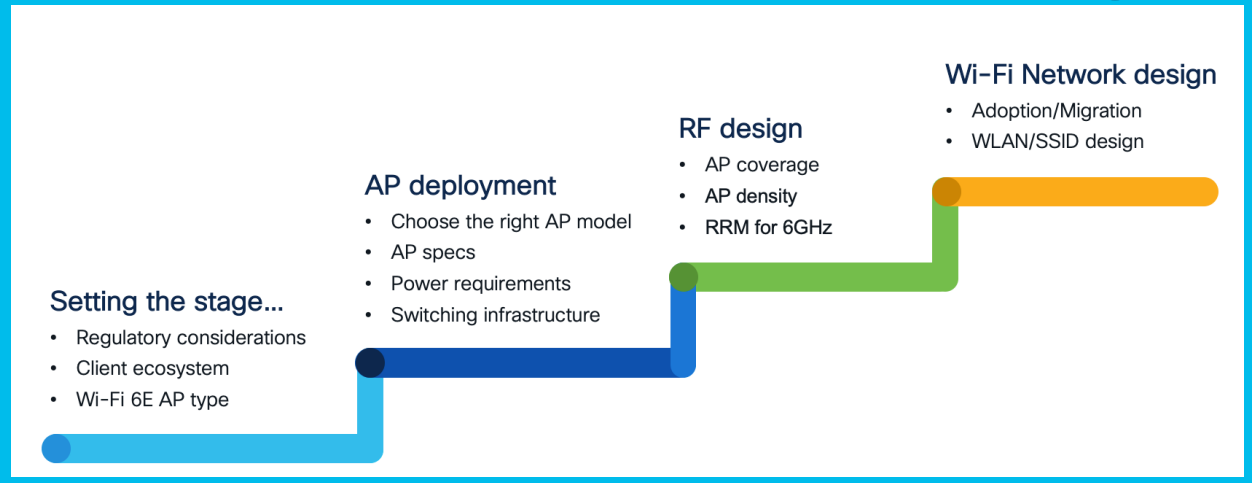


- For greenfield, a site survey is recommended: leverage the new site survey mode on Cisco Wi-Fi 6E APs
- Mixing Wi-Fi6E APs with existing APs in the same area is not recommended > avoid “salt & pepper” design if you can



AI Enhanced RRM

Wi-Fi Network Design



Wi-Fi 6/6E runs on Cisco Catalyst Wireless

Catalyst 9800
Wireless LAN Controller (WLC)

Supported Access Points

Wi-Fi 6/6E

C9136

CW9166/64

CW9162

Wi-Fi 6

9130

9124

9120

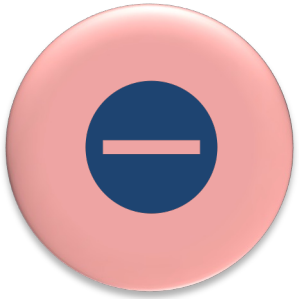
9115

9105

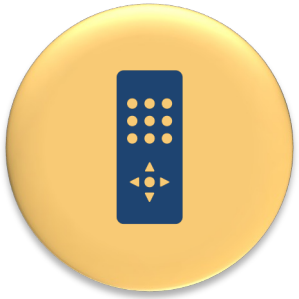
Wi-Fi 6E Security

Wi-Fi 6E uplevels security with WPA3 and OWE

WPA3 and Enhanced Open Security made mandatory for Wi-Fi 6E certification.



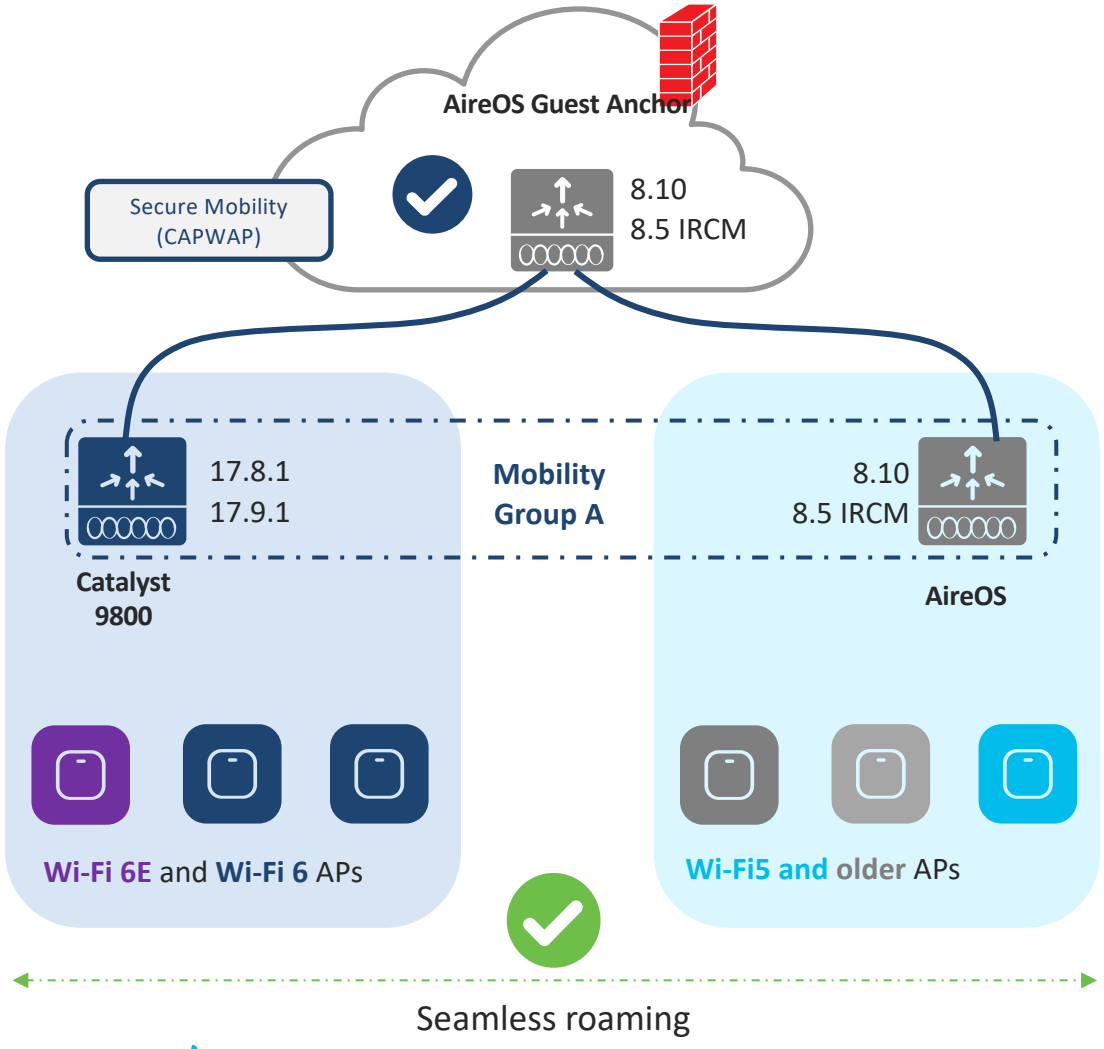
No backward compatibility with Open and WPA2 Security.



Requires Protected Management Frame (PMF) in both AP and Clients.

How do I start adopting 6GHz?

Answer: Inter Release Controller Mobility (IRCM)



IRCM enabled adoption:

- Adoption is not something that happens overnight…
- IRCM allows you to plan the 6GHz network adoption at your pace
- Introduce new 6/6E AP hadware on the new C9800 and support seamless roaming, single RF domain, and Guest Anchor with exsiting networks
- The release combinations shown have been tested at scale, check IRCM deployment guide*
- **Note**: Anchor WLC can be C9800

(*) https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-8/b_c9800_wireless_controller-aireos_ircm_dg.html

WLAN/SSID Design

6GHz WLAN Design Considerations

6GHz SSID Requirements

- WPA3 L2 Security: OWE, SAE or 802.1x-SHA256
- Protected Management Frame (**PMF**) enabled
- Any non-WPA3 L2 security method is not allowed – **no mixed mode possible**

What options would you have?

1. "ALL-IN" option: Reconfigure the existing WLAN to WPA3, one SSID for all radio policies (2.4/5/6 GHz) – Most unlikely

2. "One SSID" option: Configure multiple WLANs with the same SSID name, different security settings – Most conservative

3. "Multiple SSIDs" option: Redesign your SSIDs, adding specific SSID/WLAN with specific security settings – Most flexible

AKM = Authentication and Key Management
OWE = Opportunistic Wireless Encryption
SAE = Simultaneous Authentication of Equals
SHA-256 = Secure Hash Algorithm (SHA) 256 bit

Option 1

Pros

- Cleanest and simplest option
- No new WLAN and SSID to be managed
- Most secure with WPA3 everywhere

Cons

- Breaks support for existing clients that don't support WPA3 and PMF in 2.4 and 5GHz
- Requires full control on client devices and drivers

Option 2 has sub-options - considerations

a) WPA2/WPA3 Transition mode in 2.4/5GHz & WPA3 in 6GHz

b) WPA/WPA2 in 2.4/5GHz & WPA3 in 6GHz

Things to keep in mind:

- From the initial testing done, option 2a (transition mode/mixed mode) is not recommended as some client vendors with old drivers may have issues in connecting to a WPA3 transition mode
- Possible client issues for these options (both WPA Enterprise and Personal SSIDs), as clients will see the same SSID with different AKMs

6GHz WLAN Design Considerations

6GHz SSID Requirements

- WPA3 L2 Security: OWE, SAE or 802.1x-SHA256
- Protected Management Frame (**PMF**) enabled
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AKM = Authentication and Key Management
OWE = Opportunistic Wireless Encryption
SAE = Simultaneous Authentication of Equals
SHA-256 = Secure Hash Algorithm (SHA) 256 bit

Option 3

Pros

- Cleanest option from a client compatibility point of view
- More secure options as clients can adopt WPA3 security
- Flexibility to decide the security options per band

Cons

- Additional SSIDs being broadcasted → more RF channel utilization
- Need to manage additional SSID profiles on clients

Wi-Fi 6E, are you ready?

Is this the right time to move to 6 GHz?

Start with use cases not technology: go with 6GHz if your 2.4/5GHz RF is crowded, if applications are delay sensitive and bandwidth hungry

Check your infrastructure

Consider the switch infrastructure
Verify the power budget

Prepare your wireless

Evaluate the implications on RF and WLAN design

DNAS a DNAC

Catalyst 916x Wi-Fi 6E APs with DNA Spaces

NEW

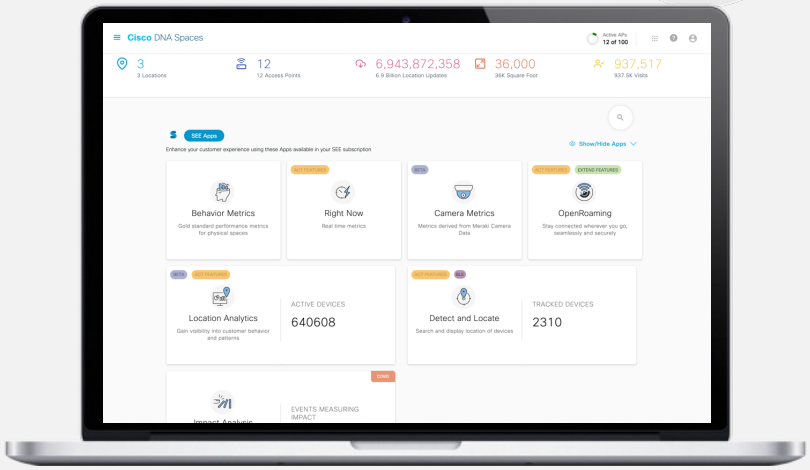
CW9162 CW9164 CW9166

BLE Radio

Indoor Air quality

Relative Humidity

Temperature

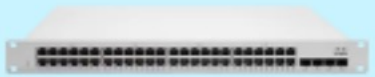


Manage, Visualize and Integrate via Cisco DNA Spaces

Smart workspaces
Bringing network and experiences together

Powerful Cisco® infrastructure

Catalyst® access points



Catalyst switching

Meraki® access points

Meraki things

Meraki video

Webex® devices

Cisco DNA Spaces **Rich maps**

Third-party sensors **Wireless and wired**

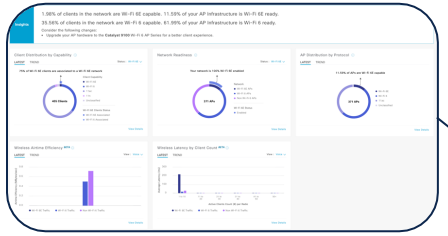
Cisco DNA Spaces

Drive outcomes

- Safe, healthy buildings
- Employee **experience**
- Employee **productivity**
- **Space utilization**

Unleash the True Potential of Your Wireless with Cisco DNA Center's AIOps!

Wi-Fi 6E Integrations



Wireless 3D Analyzer

AI-Enhanced RRM

AI Network Analytics

AP Performance Advisories

Device Ecosystem Partnerships

SAMSUNG

intel

Následující TechClub 20.9.

- **Řešení WiFi problémů prakticky**
  - Dominik Soukup, Jaroslav Čížek


CISCO