
cisco Connect LatAm
ALL IN

The bridge to possible

Architecting Next Generation Wireless Network with Wi-Fi 6/6E Access Points

Jose Correa, Technical Marketing Engineer

BRKEWN-2024

cisco Connect LatAm

Introduction

Food



Born Here



Middle Child









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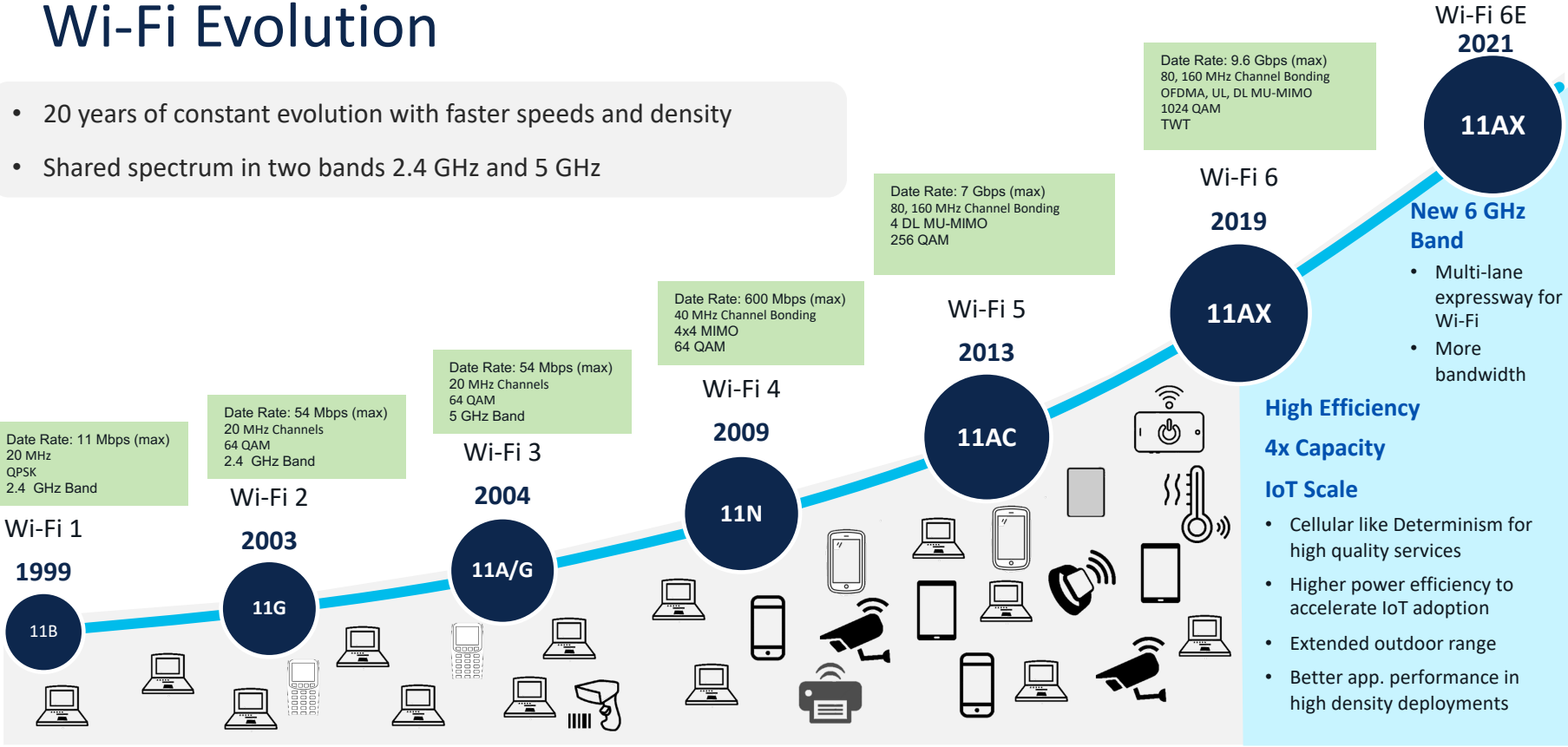
Agenda

- Why Wi-Fi 6E?
- 6 GHz Around the world
- Device Classes and Regulations
- Security in Wi-Fi 6E World
- Client Interoperability
- Catalyst Wi-Fi 6E Access Points
- Migration and Deployment

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Wi-Fi Evolution

- 20 years of constant evolution with faster speeds and density
- Shared spectrum in two bands 2.4 GHz and 5 GHz



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Why is Wi-Fi Bad ?



Too Many Devices

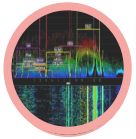


DFS Channels



Shared Spectrum – Interferes





Channel Congestion



Legacy Devices



Limited Re-usable Channels

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Before Wi-Fi – 6E …..

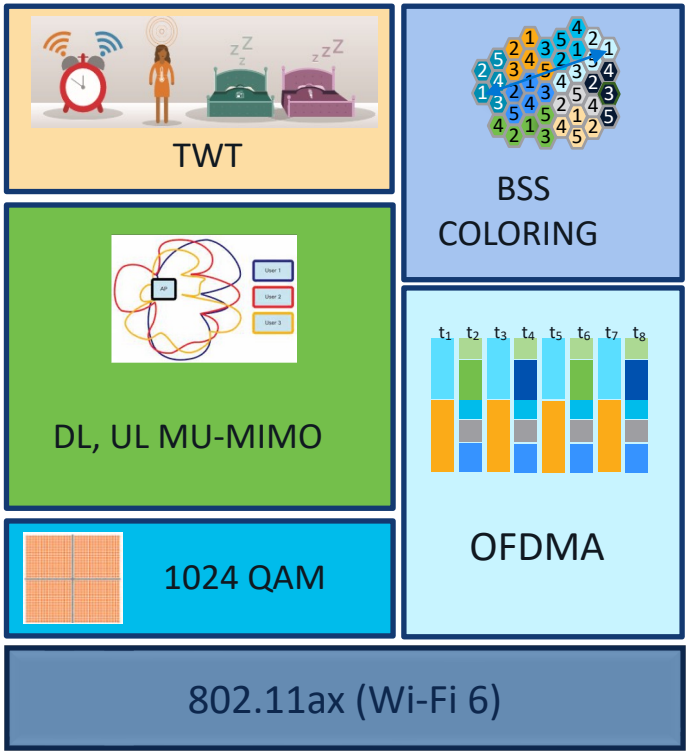


With Wi-Fi – 6E …..



Wi-Fi 6E

Wi-Fi 6 and 6GHz are friends!



1. **Additional Spectrum**
   1200 MHz (5.925 to 7.125 MHz) – US
   500 MHz (5.925 to 6.425) - EU
2. **Security Upgrade**
   WPA3 and OWE Mandatory
3. **Clean RF**
   (Fixed Mobile Service Operators in UNI-5 and UNI-7)
4. **No Legacy (Slow) Devices**
   Improves performance
5. **6 GHz WLAN Discovery**
   Airtime Efficiency
6. **Wider RF Channels**
   80 MHz channels are now a reality

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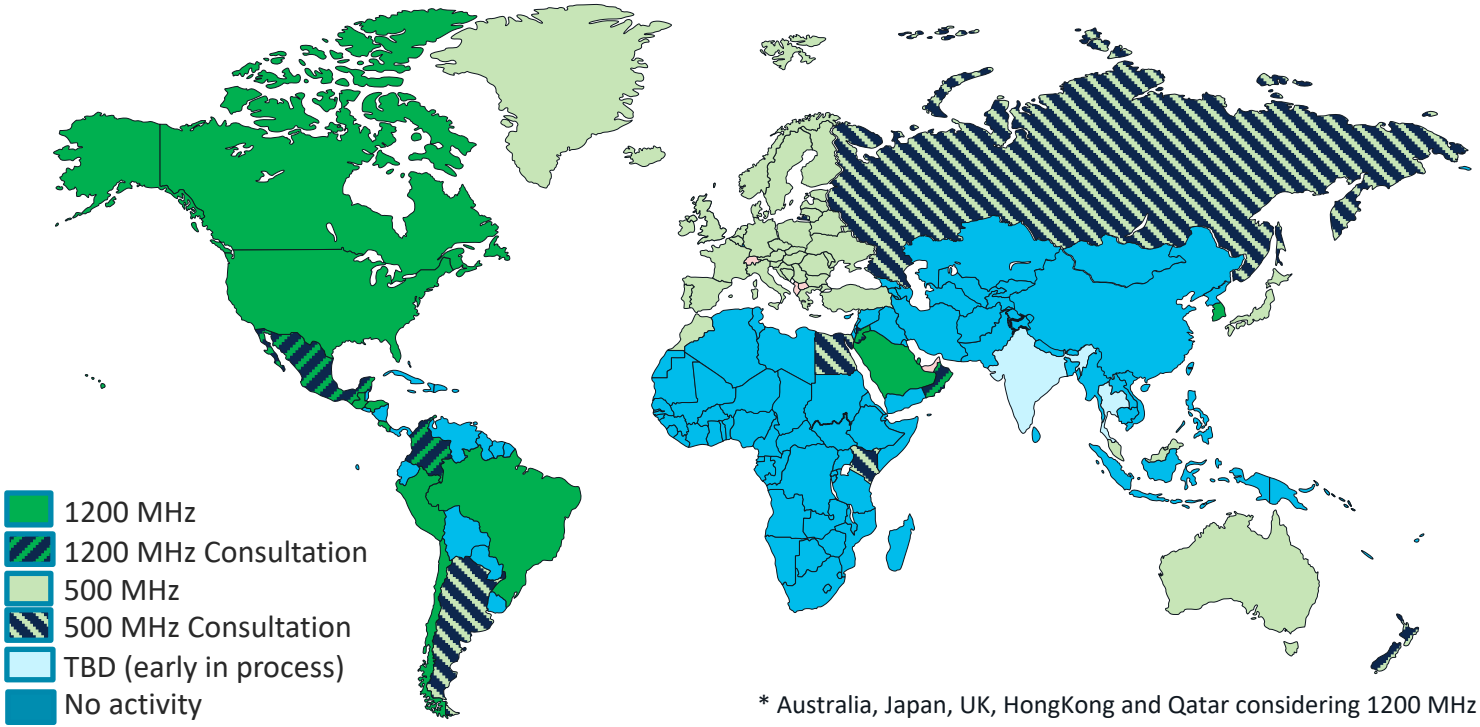


Wi-Fi 6E –
6GHz Around the World

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Global availability of 6 GHz band for Wi-Fi

(https://www.wi-fi.org/countries-enabling-wi-fi-6e)



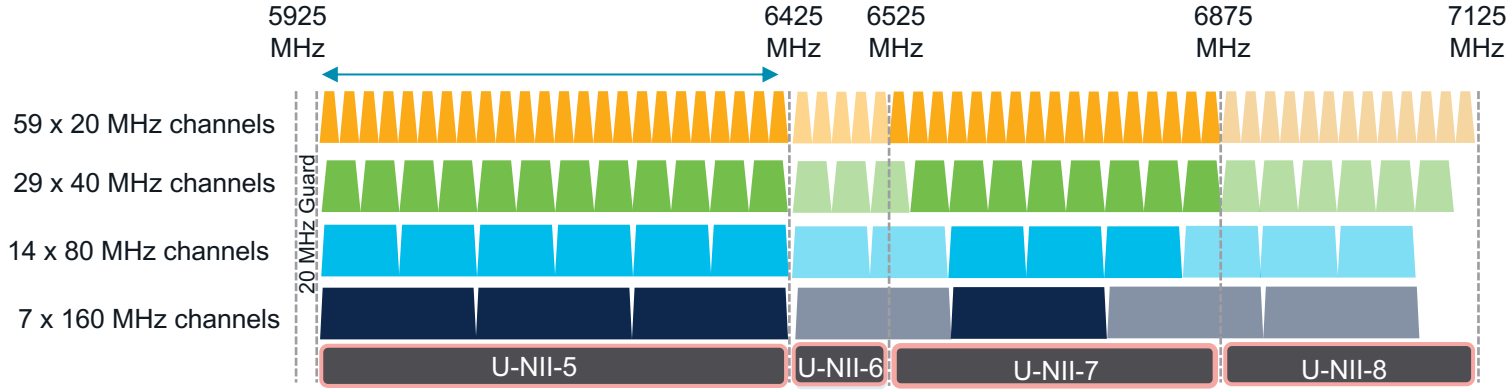
* Australia, Japan, UK, HongKong and Qatar considering 1200 MHz

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The new 6 GHz band :

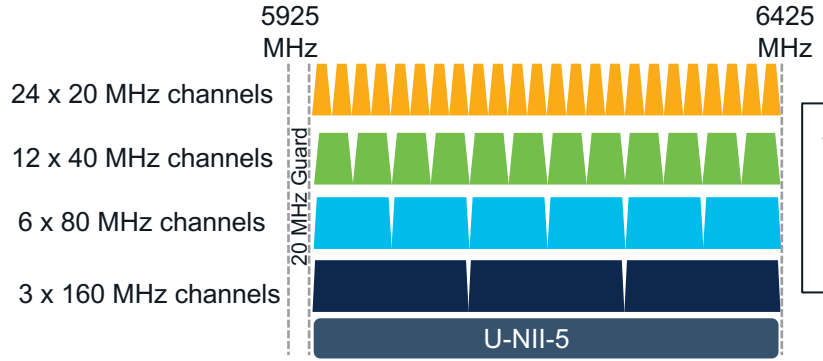
United States
1200 MHz





Europe/CEPT
500 MHz

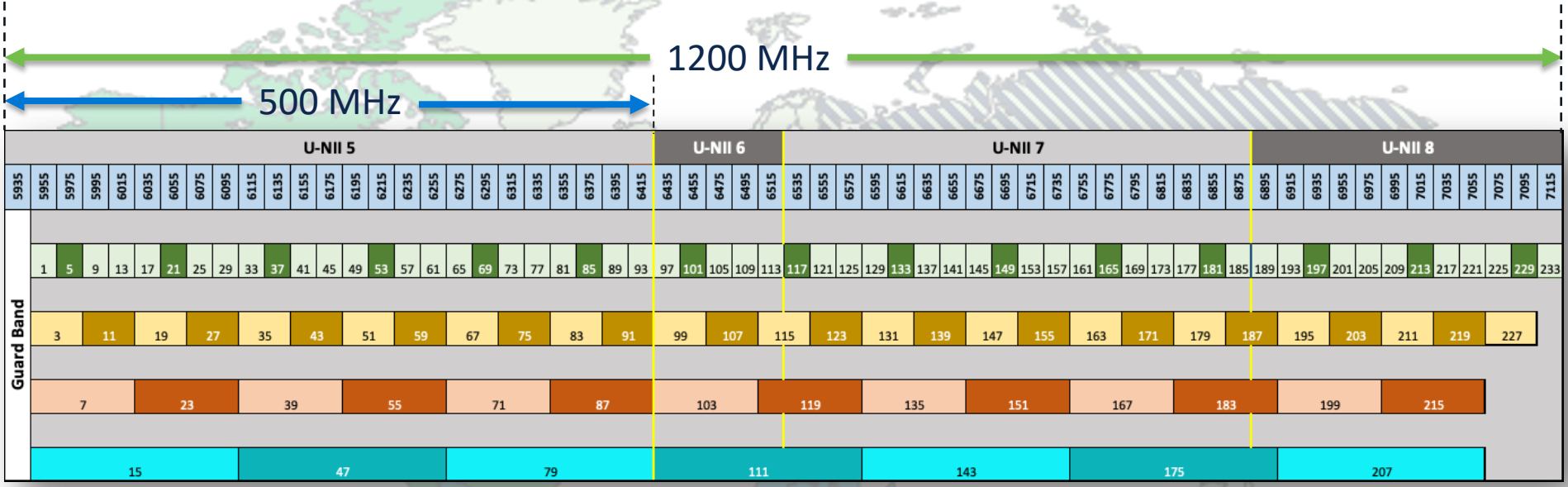




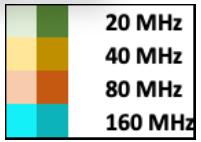
5955 – Central Frequency of the first 20 MHz channel
→ Starting at 5925 MHz +
20 MHz of guard band +
10 MHz to get to the center of the first 20 MHz channel

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The new 6 GHz band – Channel Numbering



Channel Width:



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Total Wi-Fi 6E Bookings so Far

6E BookQty

Product Fa..	Fiscal Quarter ID 2022Q4	2023Q1
C9136AX	765.0	694.0
CW9164	31.0	86.0
CW9166		151.0
Grand Total	796.0	931.0

Latin America

6E BookQty

Product Fa..	Fiscal Quarter ID 2022Q4	2023Q1
C9136AX	77,771	73,339
CW9162		133
CW9164	4,667	17,263
CW9166	15,381	42,056
Grand Total	97,819	132,791

Americas

6E BookQty

Product Fa..	Fiscal Quarter ID 2022Q4	2023Q1
C9136AX	107,447	106,537
CW9162		1,498
CW9164	7,939	41,396
CW9166	22,388	61,082
Grand Total	137,774	210,513

Worldwide

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6 GHz – New Device Classes

Low Power Indoor AP

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

Standard Power AP

- Indoor or Outdoor
- Integrated or External Antenna
- UNII-5 and UNII-7 Only (US)
- Requires AFC

Very Lower Power AP

- Mobile Indoor or Outdoor
- Limited Range
- Can use the full 1200 MHz
- Does not require AFC

Client Devices

- Indoor or Outdoor
- Only Indoor under control of LPI AP
- 6 dBm lower power than AP

Wi-Fi 6E introduces new device classes for optimized capability

Regulations vary by country

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Wi-Fi 6E – Security

Wi-Fi 6E Security

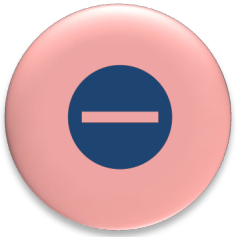


Wi-Fi 6E uplevels security with WPA3 and OWE

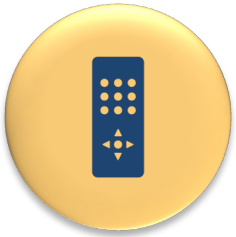


WPA3 and Enhanced Open Security made mandatory for Wi-Fi 6E certification.

Wi Fi™ WPA3



No backward compatibility with Open and WPA2 Security.



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

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6GHz WLAN Design Considerations

6GHz SSID Requirements

- WPA3 L2 Security: OWE, SAE or 802.1x-SHA256
- Protected Management Frame (**PMF**) enabled
- Any other 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

Most likely your current SSID configuration would prevent it from being broadcasted on 6GHz
Note: as 17.9.1, there is a limit of 8 SSIDs broadcasted on 6GHz radio

Opportunistic Wireless Encryption (OWE)
Simultaneous Authentication of Equals (SAE)
Secure Hash Algorithm (SHA) 256 bit

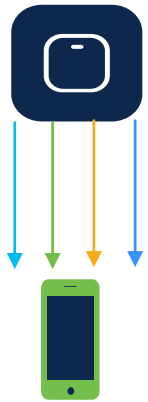
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Wi-Fi 6E Security Deployment Considerations

- Layers of Wi-Fi Security
  - Clients with WPA2/WPA/Open continue to operate in 2.4 and 5 GHz bands.
  - 6 GHz operates exclusively with WPA3 and Enhanced Open Security
- Use of different SSIDs for 6 GHz band

2.4 & 5 GHz Bands

SSID: employees
(WPA2-Enterprise)
SSID: guest
(WPA2-Personal)



6 GHz Band

SSID: employees-wpa3
(WPA3-Enterprise)
SSID: guest-wpa3
(WPA3-Personal/H2E *)

**Note: Only H2E is the supported SAE in 6GHz Band*

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Wi-Fi 6E/WPA3 Client Security Matrix

Protocol	Encryption	AKM	Intel AX210	Qualcomm HSPv2 WCN6855	Samsung /Google Android
OWE	AES-CCMP128	OWE	Supported	Supported	Supported
SAE	AES-CCMP128	SAE 6GHz: H2E Only	Supported: H2E only SAE-FT: Windows does not support. SAE-FT: Linux supports it. *(No limitation on AX210)*	Supported	Supported: H2E only SAE-FT: Galaxy S21 Ultra, Galaxy Z Fold 3 has capable to support, but currently it is disabled. Can be enabled by usermode fw on protos only.

Note: Client Security Matrix with AP Mode as Local

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Wi-Fi 6E/WPA3 Client Security Matrix

Protocol	Encryption	AKM	EAP Method	FT-OTA	FT-ODS	Adaptive	Intel AX210	Qualcomm HSPv2 WCN6855	Samsung / Google Android
Enterprise	AES-CCMP128	802.1x-SHA256	PEAP/FAST/TLS	Supported	Supported	Supported	Supported: SHA256 & FT-OTA Not-Supported: EAP-FAST, FT-ODS,	Supported	Supported: SHA256 & FT-OTA Not-Supported: EAP-FAST Not-Supported: FT-ODS
Enterprise	GCMP128	SuiteB-1X	PEAP/FAST/TLS			Not Supported	Not-Supported	Not-Supported	Not-Supported
Enterprise	GCMP256	SuiteB-192	TLS				Supported: GCMP256 Not-Supported: EAP-FAST & FT(both FT-OTA & FT-ODS)	Supported: GCMP256	Supported: GCMP256 & FT-OTA Not-Supported: FT-ODS

Note: Client Security Matrix with AP Mode as Local

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Wi-Fi 6E – Client Eco System

Wi-Fi 6E Client Device Eco System

Wide range of client support ..

Upgrade to Windows 11!
Update the Wi-Fi driver and Bios!!



Samsung Galaxy Ultra S21/S22



Samsung Galaxy Z Fold



Google Pixel 6 /Pro



Xiaomi Mi 11 /Ultra



ASUS Zenfone 8 and 8 Flip



Motorola Edge (2021)

Samsung Galaxy Tab S8, S8+





Laptops with Intel AX210/AX211/AX411 Chipset



Redmagic 6s Pro

Wi-Fi 6E Chipsets











with more coming soon …..

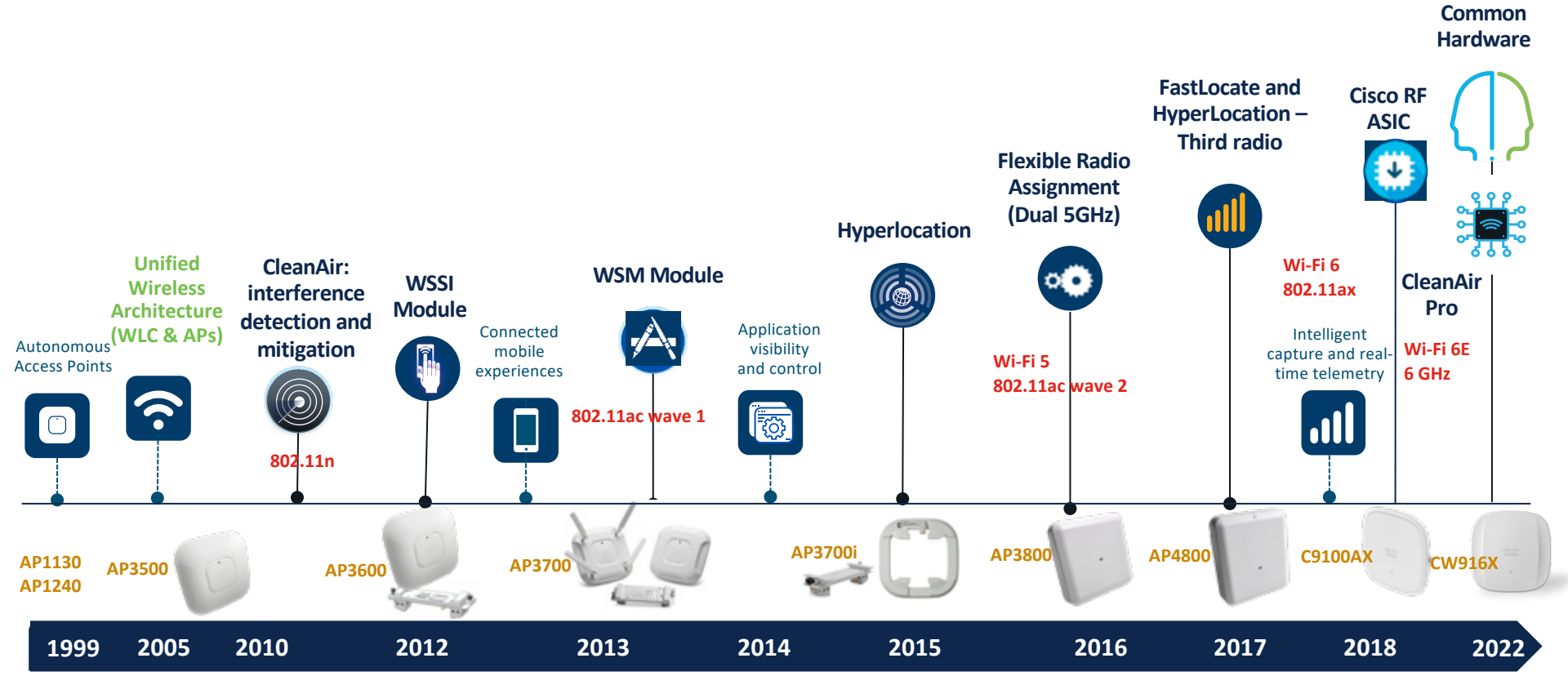
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Catalyst Wi-Fi 6E Access Points

Cisco Wi-Fi innovations

For every major change in WLAN over the last 20+ years



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New Wi-Fi 6E Access Points

One Product, Two Management Modes



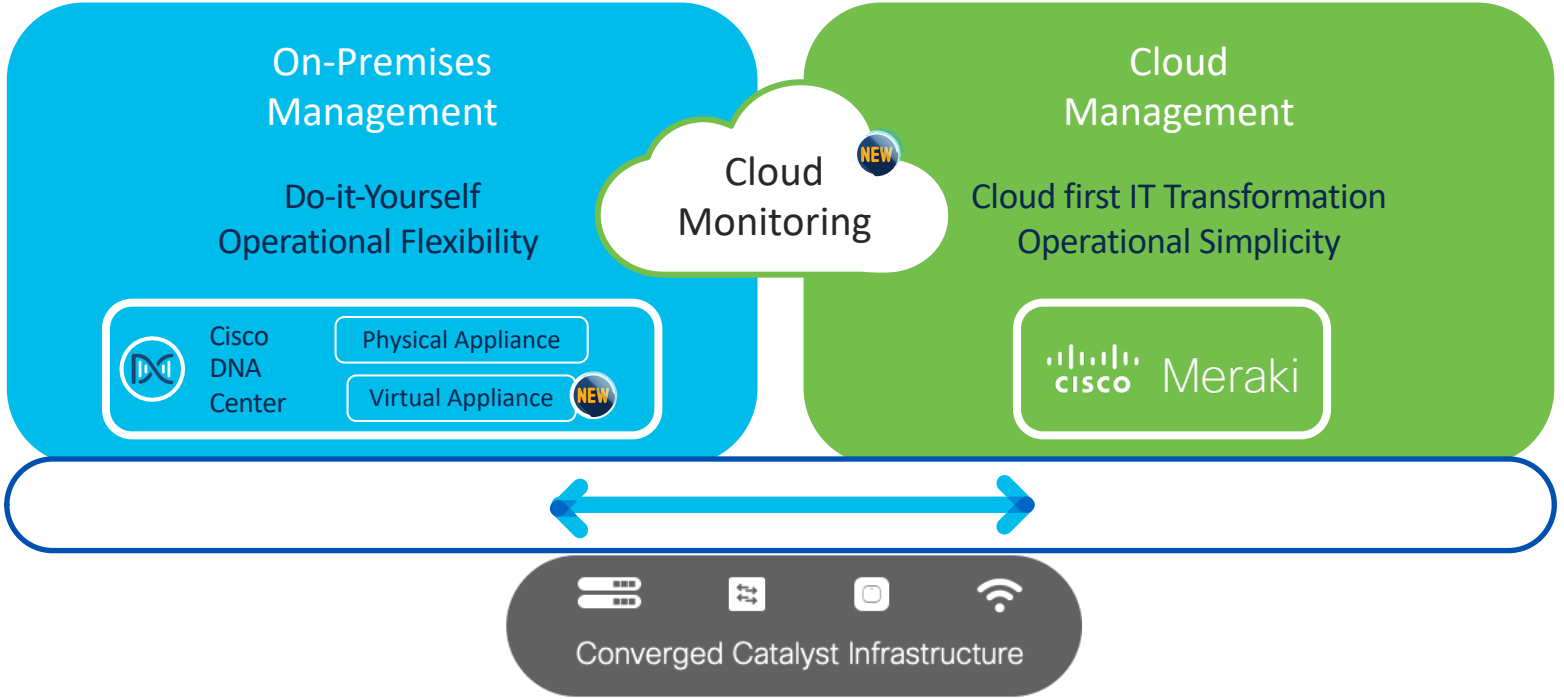
DNA mode
C9800 &
Cisco DNA Center Stack

Meraki mode
MR Dashboard Stack

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Your IT, Your Way

Flexibility, Choice, and Simplicity



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The Cisco Catalyst 6E Portfolio









Ideal for small to medium-sized deployments → **Best in class, flexible** → **Mission critical, resilient**

CW 9162I*

- 2x2, 2x2, 2x2
- 2.5 Gbps Multigigabit
- DC power
- IoT radio/Bluetooth 5.x
- 4.5W USB

CW 9164I

- 2x2, 4x4, 4x4
- 2.5 Gbps Multigigabit
- DC power
- IoT radio/Bluetooth 5.x
- 4.5W USB

CW 9166I

- 4x4, 4x4, 4x4 (XOR 5/6)
- 5 Gbps Multigigabit
- DC power
- IoT radio/Bluetooth 5.x
- 4.5W USB
- Full Intelligent Capture
- Zero-wait Dynamic Frequency Selection (DFS)**
- Environmental sensor

C9136I

- 4x4, 8x8, 4x4
- Dual 5 Gbps Multigigabit, active failover
- IoT radio/Bluetooth 5.x
- 9W USB
- Full Intelligent Capture
- Zero-wait DFS**
- Environmental sensor

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

AP power optimization | Dedicated radio for CleanAir® Pro | Same bracket, same industrial design

**Available post-FCS.

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

6E



9162



9164



9166



9136

6



9105I/W



9115



9120



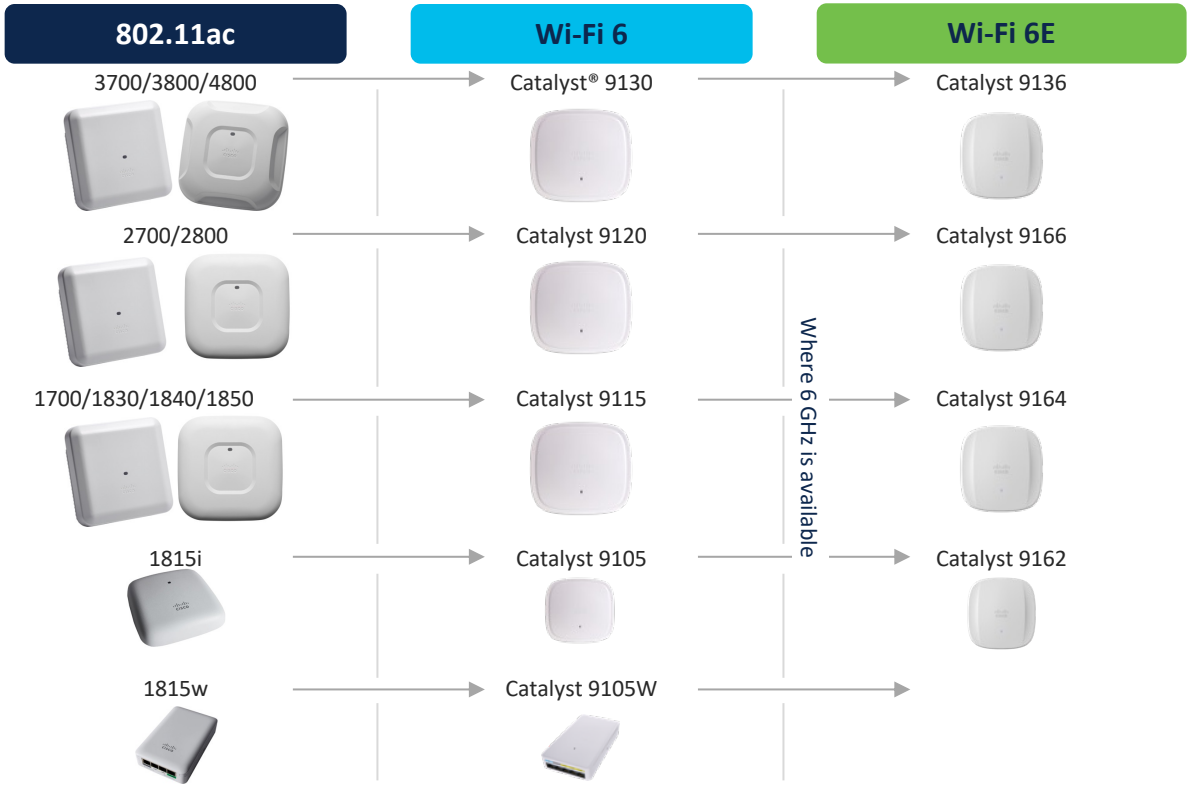
9130



9124

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Recommended Upgrade Path



For Wi-Fi 6E, external APs and outdoor uses are not yet permitted by regulatory bodies

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Wi-Fi 6E Access Points Power Tables

C9136i

Power Source	Number of SS	2.4 GHz Radio	5g GHz Radio	6Ghz Radio	mGig Link Speed	USB	AI/ML Scanning Radio
802.3af	N/A	Disabled	Disabled	Disabled	1G	Disabled	Y
802.3at	8	Disabled	4x4	4x4	2.5G	Disabled	Y
802.3bt	16	4x4	8x8 or Dual 4x4	4x4	5G	Y/9W	Y

CW9166i

Power Source	Number of SS	2.4 GHz Radio	5g GHz Radio	5 GHz / 6Ghz Radio	mGig Link Speed	USB	AI/ML 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/4.5W	Y
DC Power	12	4x4	4x4	4x4	5G	Y/4.5W	Y

Note:

If Power Injector is required, AIR-PWRINJ7 is Cisco's official 802.3bt Power Injector

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Wi-Fi 6E Access Points Power Tables (Cont.)

CW9164i

Power Source	Number of SS	2.4 GHz Radio	5g GHz Radio	6Ghz Radio	mGig Link Speed	USB	AI/ML 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/4.5W	Y
DC Power	10	2x2	4x4	4x4	2.5G	Y/4.5W	Y

CW9162i

Power Source	Number of SS	2.4 GHz Radio	5g GHz Radio	6Ghz Radio	mGig Link Speed	USB	AI/ML Scanning Radio
802.3af	2	Disabled	1x1	1x1	1G	Disabled	Y
802.3at	6	2x2	2x2	2x2	2.5G	Y/4.5W	Y
802.3bt	6	2x2	2x2	2x2	2.5G	Y/4.5W	Y
DC Power	6	2x2	2x2	2x2	2.5G	Y/4.5W	Y

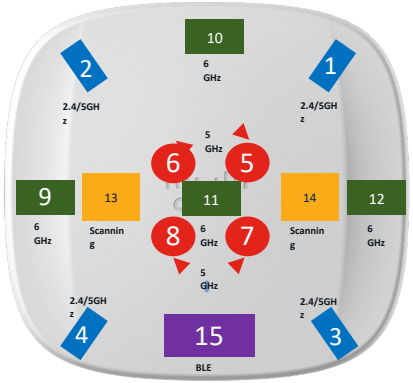
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If Power Injector is required, AIR-PWRINJ7 is Cisco's official 802.3bt Power Injector

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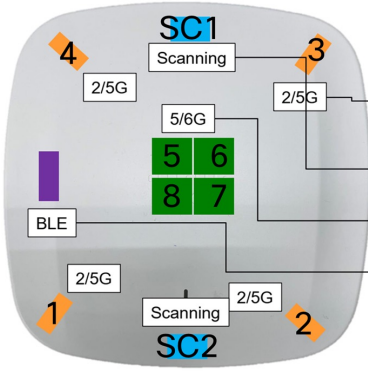
Wi-Fi 6E Access Points Antenna Arrays

C9136i



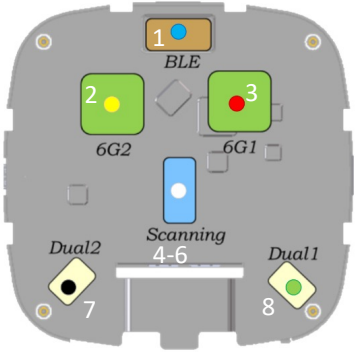
Antenna #	Frequency Combination		Antenna Type	Polarization
1 -4	Wi-FI 2.4/5 GHz	2.4 ~2.5 GHz 5.15~5.85 GHz	PIFA 3/5 dBi	V-Pol
5-8	Wi-FI 5 GHz	5.15~5.85 GHz	Alford Loop 5 dBi	H-Pol
9-12	Wi-FI 6 GHz	5.93~7.12 GHz	PIFA 6 dBi	V-Pol
13-14	Scanning	2.4~2.5 GHz 5.15~7.12 GHz	PIFA 3-6 dBi*	V-Pol
15	BLE	2.4~2.5 GHz	PIFA 5 dBi	V-Pol

CW9164/9166i



Frequency combination		ANT Type	Polarization
Wifi2/5G	2.4~2.5GHz 5.15~5.85GHz	Folded monopole (30 x 17 x 8.5 mm)	Vertical
Scanning (2/5/6G)	2.4~2.5GHz 5.15~7.125GHz	PIFA (30 x 20 x 8.0 mm)	Mixed
Wifi5/6G	5+6GHz (5.15~7.125GHZ)	H-POL Alford loop (30 x 30 x 0.8 mm)	Horizontal
BLE	2.4GHz	PIFA (30 x 14 x 8.6 mm)	Mixed

CW9162i



Antenna #	Frequency Combination
1	BLE antenna < 4.0 dBi
2-3	6 GHz antenna < 5.5 dBi
4-6	Scanning antenna @ 2.4 GHz < 4.0 dBi Scanning antenna @ 5 GHz < 6.0 dBi Scanning antenna @ 6 GHz < 6.0 dBi
7-8	Dual Band antenna @ 2.4 GHz < 5.0 dBi Dual Band antenna @ 5 GHz < 6.0 dBi

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Conversion overview

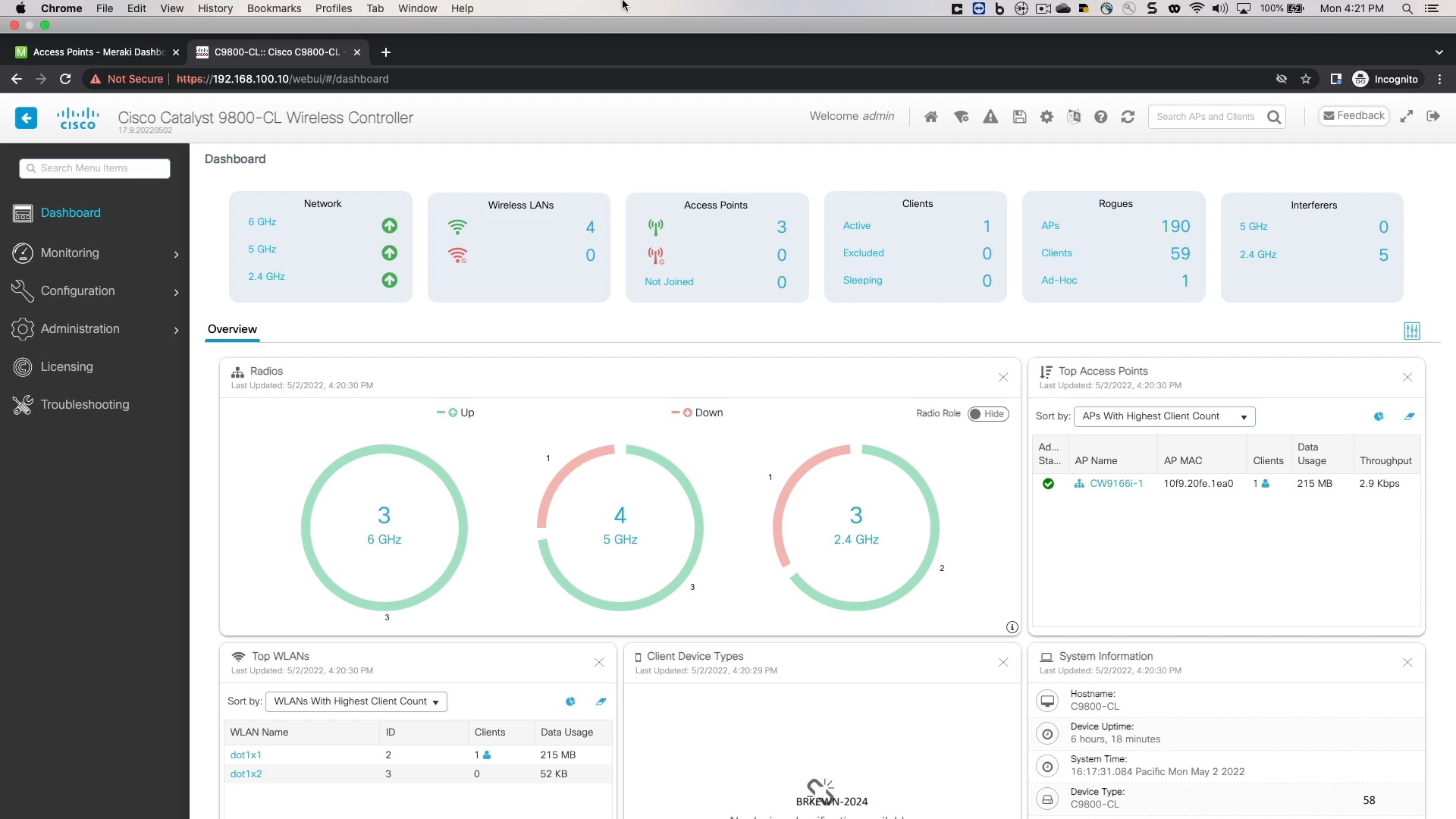


Done from C9800 WLC



Call Meraki Support
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Chrome File Edit View History Bookmarks Profiles Tab Window Help
Mon 4:21 PM
Access Points - Meraki Dashbc
C9800-CL:: Cisco C9800-CL -
Not Secure | https://192.168.100.10/webui/#/dashboard
Incognito
Cisco Catalyst 9800-CL Wireless Controller
17.9.20220502
Welcome admin
Search APs and Clients
Feedback
Search Menu Items
Dashboard
Monitoring
Configuration
Administration
Licensing
Troubleshooting
Dashboard
Network
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5 GHz
2.4 GHz
Wireless LANs
4
0
Access Points
3
0
Not Joined
0
Clients
Active
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Excluded
0
Sleeping
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Rogues
APs
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Clients
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Ad-Hoc
1
Interferers
5 GHz
0
2.4 GHz
5
Overview
Radios
Last Updated: 5/2/2022, 4:20:30 PM
Up
Down
Radio Role
Hide
3
6 GHz
4
5 GHz
3
2.4 GHz
Top Access Points
Last Updated: 5/2/2022, 4:20:30 PM
Sort by:
APs With Highest Client Count
Ad... Sta...
AP Name
AP MAC
Clients
Data Usage
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CW9166i-1
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215 MB
2.9 Kbps
Top WLANs
Last Updated: 5/2/2022, 4:20:30 PM
Sort by:
WLANs With Highest Client Count
WLAN Name
ID
Clients
Data Usage
dot1x1
2
1
215 MB
dot1x2
3
0
52 KB
Client Device Types
Last Updated: 5/2/2022, 4:20:29 PM
System Information
Last Updated: 5/2/2022, 4:20:30 PM
Hostname:
C9800-CL
Device Uptime:
6 hours, 18 minutes
System Time:
16:17:31.084 Pacific Mon May 2 2022
Device Type:
C9800-CL
58
BRKEWN-2024

Catalyst 9136 and 9166 have three built-in environmental sensors with Cisco Spaces



Air quality

The built-in Gas Sensor Module will enable the reading of Total Volatile Organic Compound (TVOC) concentration and Indoor Air Quality (IAQ) rating.

Humidity

The built-in module is a fully calibrated sensor with the ability to measure the relative humidity in the air.

Temperature

The built-in module can also capture the temperature to provide a reading of the environment remotely.

AP Product	IOS-XE Release
C9136	17.8.1
CW9166	17.9.1

Note: The temperature generated by the AP will be considered during temperature and IAQ readings.

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Wi-Fi 6E Migration and Deployment Guidelines & Pointers

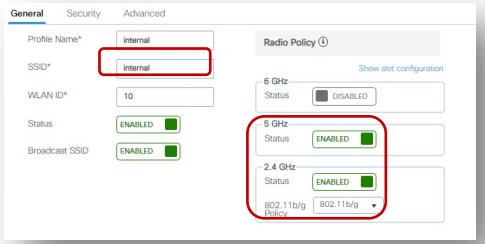


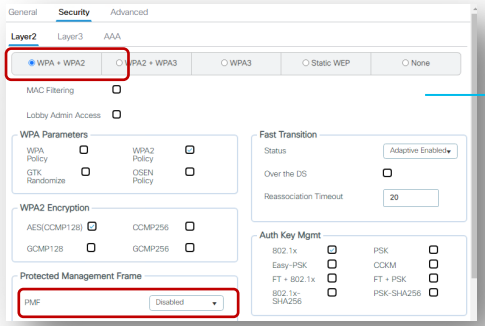
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Wi-Fi 6E WLAN Configuration – Example 1

Add a separate WLAN with different SSID name for WPA3 and broadcast it in all bands. Leave the existing WLAN/SSID untouched.

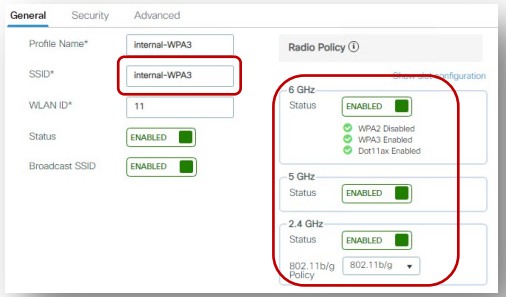
Legacy SSID

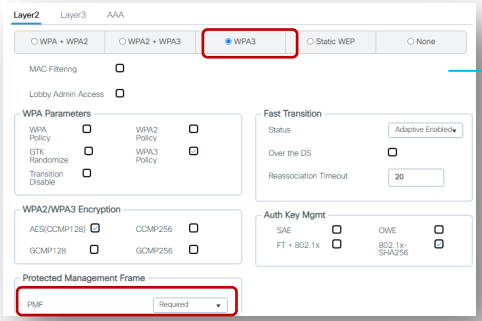




Existing WPA/WPA2 SSID in 2.4 and 5GHz for legacy clients

New SSID



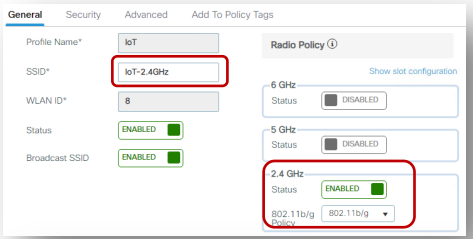


Dedicated SSID for WPA3 capable clients in all bands.
This is the SSID for 6GHz

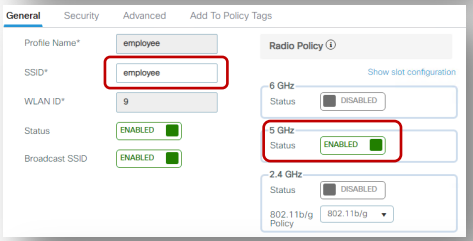
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Wi-Fi 6E WLAN Configuration – Example 2

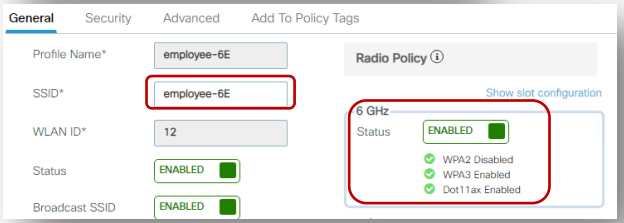
Redesign the WLANs, reserving each band for a specific device/use case



2.4GHz dedicated to specifc devices. These could be legacy devices or IoT devices. If IoT will be mostly PSK



5GHz dedicated to majority of existing clients



WPA3 on 6GHz only for the newest clients

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Wi-Fi 6E WLAN Design Considerations



Pros

- Cleanest option from a client compatibility point of view
- More secure options as clients can adopt WPA3 security
- WPA3 clients can roam across different bands



Cons

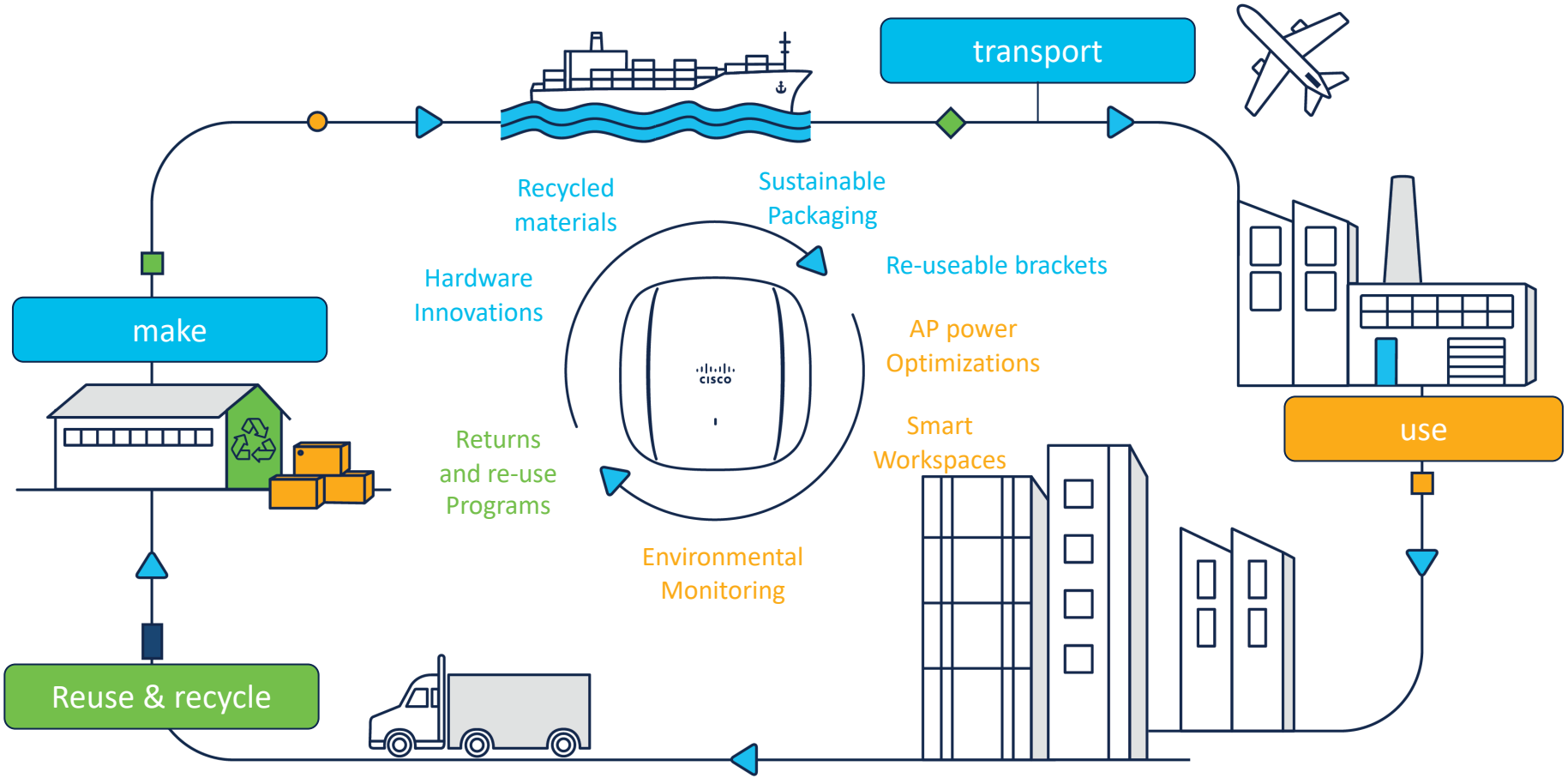
- Additional SSIDs to manage and broadcast
- Need to manage additional SSID profiles on clients

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Wi-Fi 6E Power Optimizations

Catalyst Wireless Is Sustainable Across the Product Lifecycle



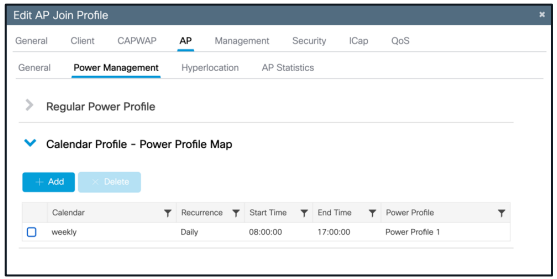
AP Power Optimizations Feature Suite

Save Power, Reallocate Power, and Visibility into Savings

AP Power Save Mode

Lower AP Power Usage

- Create a calendar profile for off-peak hours.
- Create a power profile to lower the power consumption budget during off-peak hours.
- Power Profile: Shut AP Radio or lower spatial Stream, lower port speed, disable USB port.

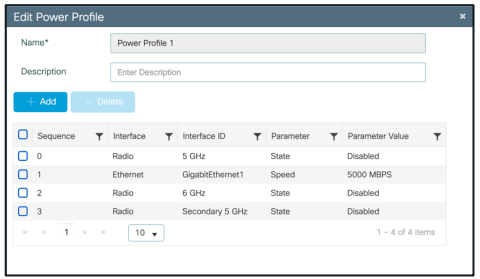


IOS-XE 17.8

AP Power Distribution

Control over how power is used

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



IOS-XE 17.10

AP Power Savings Insight

Power, Money, and Emissions Savings on Cisco DNA Center

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

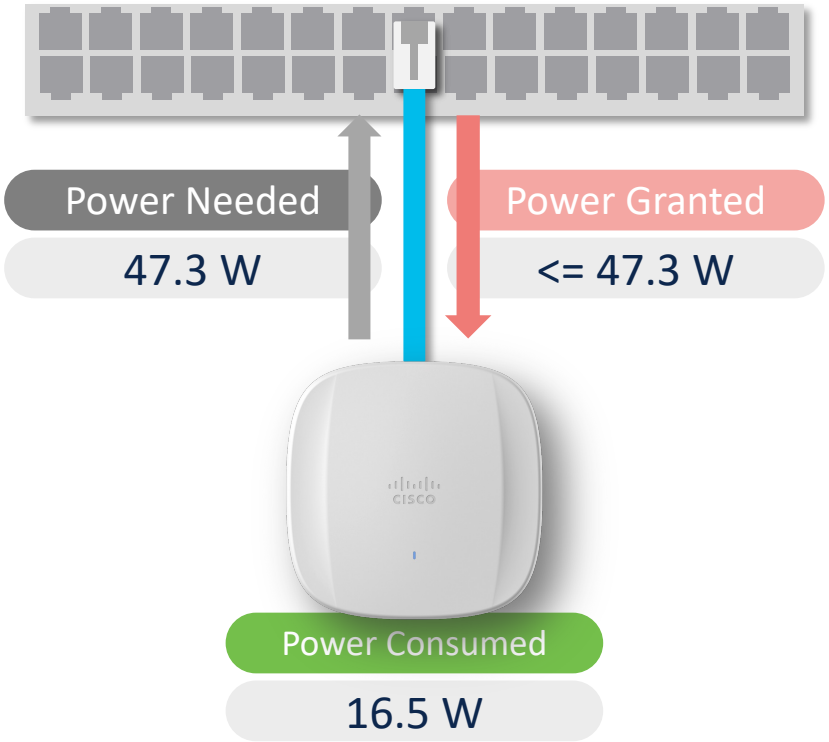


Note: Cisco DNA Center integration is on the roadmap

Supported on 9115, 9120, 9130, 9136, 9166, 9164, 9162

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Actual Power Consumption at the Switch



PoE Power Negotiation is not affected

Actual power consumption by the AP will be lower

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Fixed Power Profile

The pre-defined default operating mode for all the interfaces at each power mode (802.af,at,bt)

Input power	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	IoT Radio	Environmental Sensors	Max power draw
802.3bt (Cisco UPOE®)	16	4x4	8x8 or Dual 4x4		4x4	5G	5G	Yes (9W)	Y	Y	Y	47.3W
802.3at (PoE+)	8	Disabled	4x4	Disabled	4x4	2.5G	Disabled	Disabled	Y	Y	Y	24.4W
802.3af (PoE)	0	Disabled	Disabled		Disabled	1Gig	Disabled	Disabled	Y	Y	Y	14W

17.9.1

Note: These are different per AP platform.



Catalyst 9136

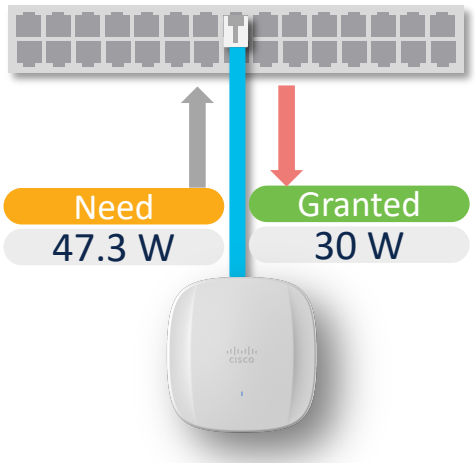
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AP Power Saving vs AP Power Distribution

IOS-XE 17.8

AP Power Saving

- During off-work hours, APs will be put into Power Save Mode to save $$$s and Power
- Customers can define the off-work hours using a calendar profile



NEW

IOS-XE 17.10

AP Power Distribution

- When Switch **GRANTs** less than what AP NEEDs, the APs will operate in a fixed power mode for that power level
- Provided Power will be “Distributed” among Radios, Ethernet, USB to not exceed the Switch PoE Power
- Some Of the Interfaces May be
  - Disabled
  - Operate at lower speeds
- **Users can now customize the interface operation mode using Power Policies**

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AP Power Profile



AP Power Profile

- Prioritized set of rules that define how the AP will run
- Can Configure:
  - Radios to be **disabled or adjust number of spatial streams**
  - Ethernet
    - GigabitEthernet **line speed**
    - LAN ports to be **derated***
  - USB port to be **disabled**



Addition Considerations

- AP Power Profile is used for **both** AP Power Save and AP Power Distribution.
- If clients still need to connect, leave at least one radio enabled.
  - The radio enabled should be the one broadcasting the SSID.

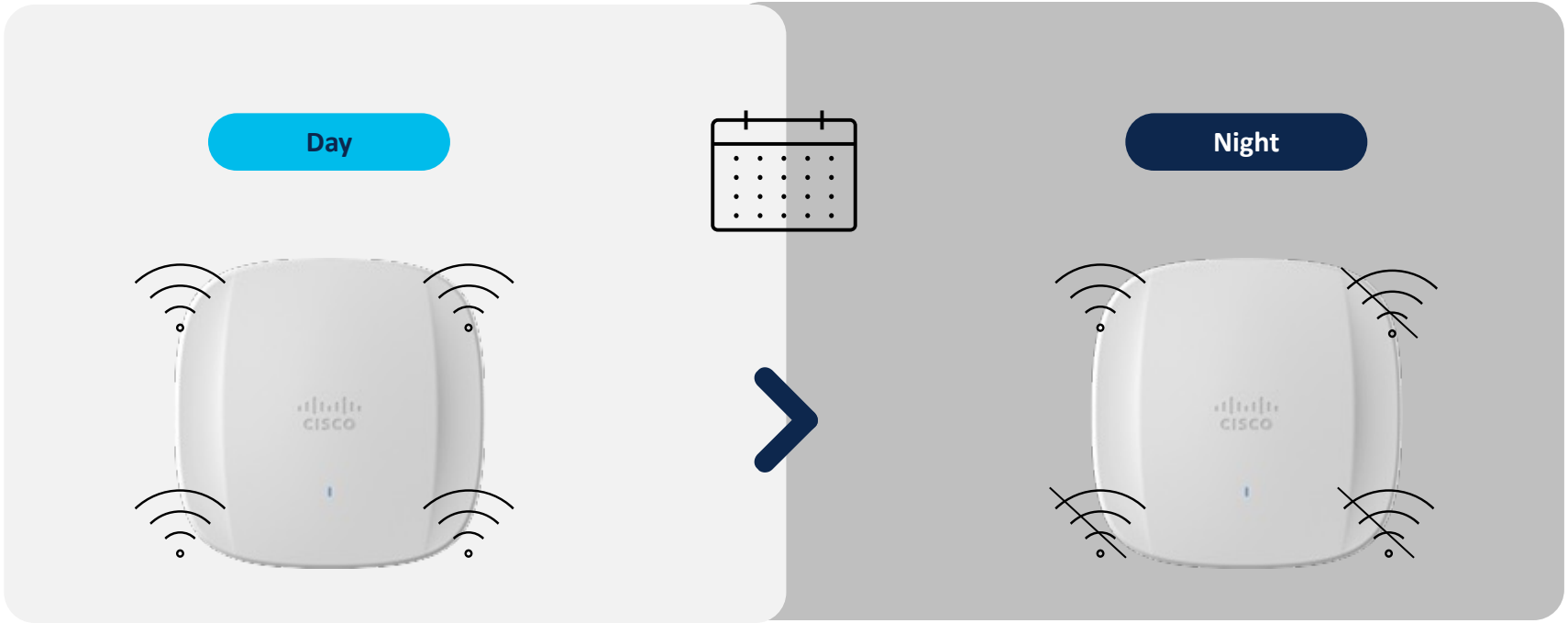
Note: If APs do not support configured settings (ex. 6GHz or GigabitEthernet1), the settings will not be applied.

*upcoming software release

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AP Power Save Mode

AP power save mode allows administrators to schedule periods of time where APs should, for example, turn off radios to save power, thus reducing power consumption



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AP Power Save Mode

- APs can switch into low power mode when no clients are associated (i.e., no users are in the building and using wireless services)
- Define Power Profiles that affect the various AP interface states:

Radios: 6GHz, 5GHz, 2.4GHz / Spatial Streams

Ethernet Ports*

USB Port

Supported Access Points

9136

CW9166I

CW9164I

CW9162I



9130

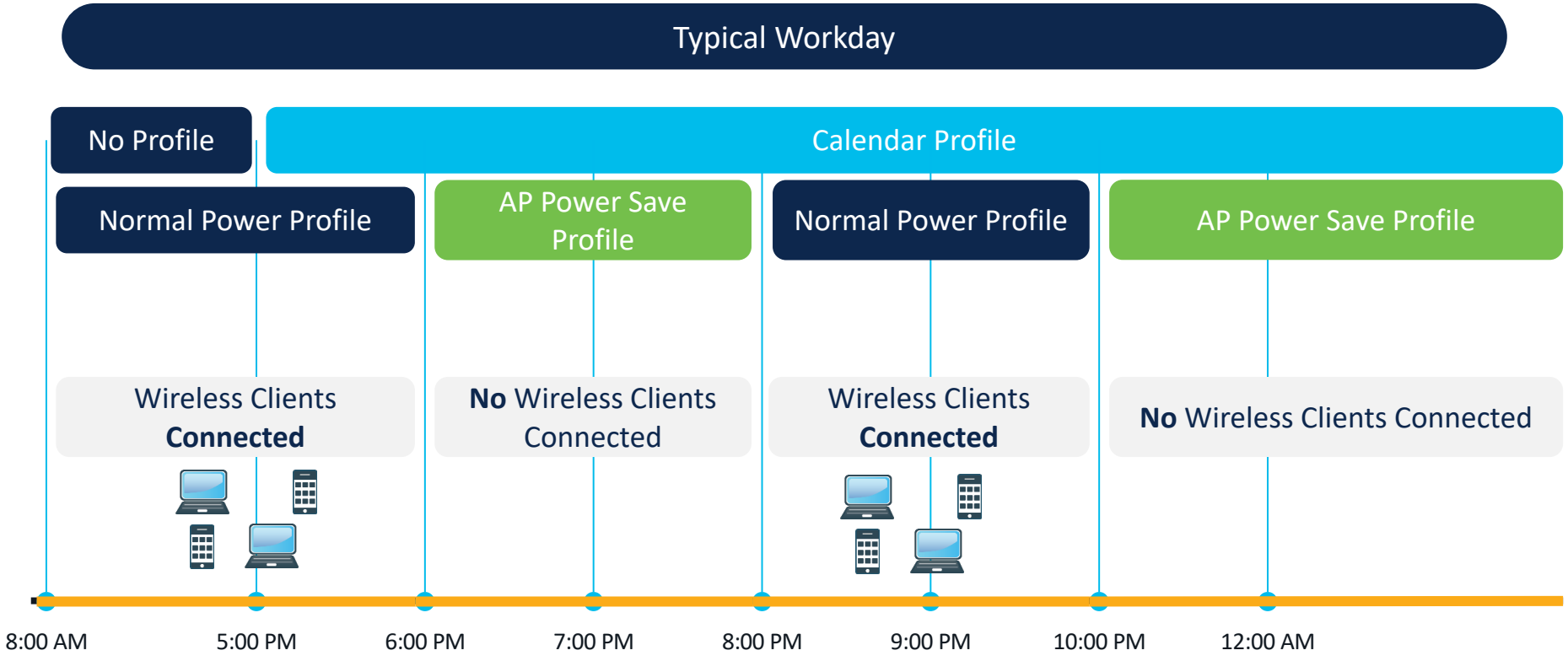
9120

9115



*upcoming software release

AP Power Save Mode Behavior with Clients



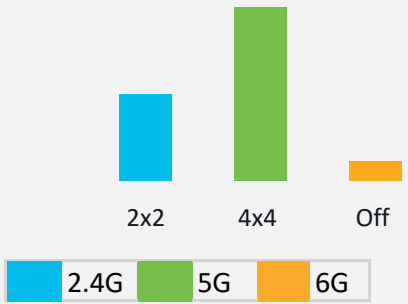
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AP Power Distribution

New **AP Power Distribution** allows admins control over how APs operate when provided less than full power (30W/PoE+), enabling maximum utility of the AP.

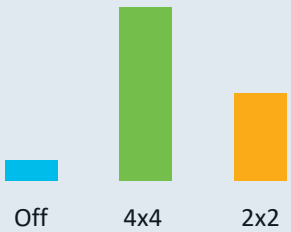
Scenario 1

Mainly 2.4 GHz & 5 GHz clients
(Or 6 GHz not allowed)



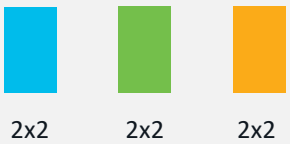
Scenario 2

Mix of 5 and 6GHz clients



Scenario 3

Balanced



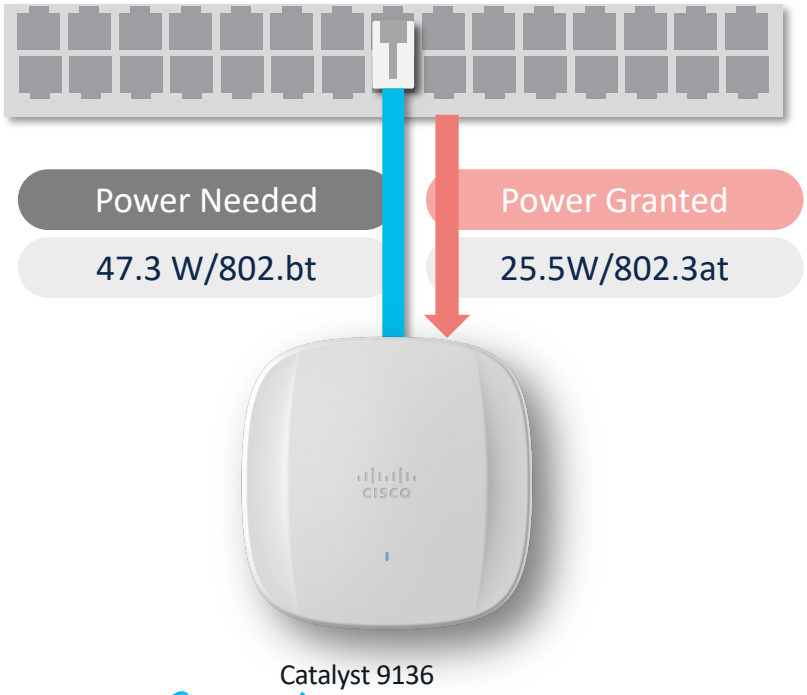
Available now in 17.10!

Numbers are examples, and will depend per AP platform

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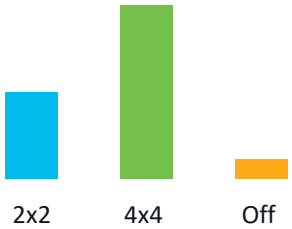
AP Power Distribution

AP power distribution allows users to customize the interface operation mode using Power Policies making it flexible when there is not the standard operating power given to the AP



Scenario 1

Mainly 2.4 GHz & 5 GHz clients
(Or 6 GHz not allowed)



Power Policy Profile

- Disable 6GHz Radio
- 5GHz Radio as 4x4
- 2.4GHz Radio as 2x2

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AP Power Distribution

NEW

- Customize the AP power budget while operating on less power.
- The following interfaces can be adjusted to fit the user's specific needs:

Radios: 6GHz, 5GHz, 2.4GHz / Spatial Streams

Ethernet Ports*

USB Port

Supported Access Points

9136



CW9166I



CW9164I



CW9162I



9130



9120



9115



*upcoming software release

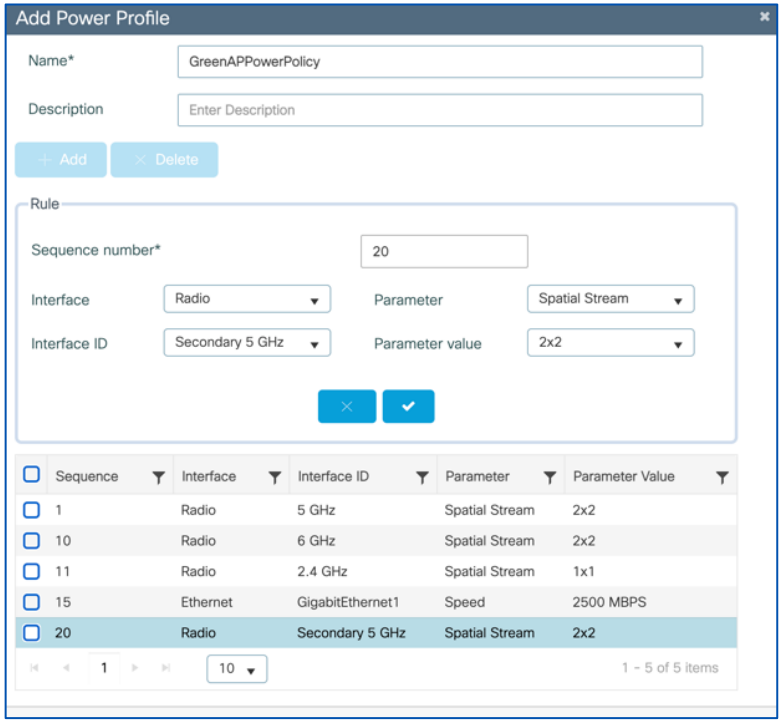
AP Power Optimization – AP Power Save and AP Power Distribution

Configuration & Status Monitoring



Configuring the AP Power Profile

Configuration → Tags & Profiles → Power Profile

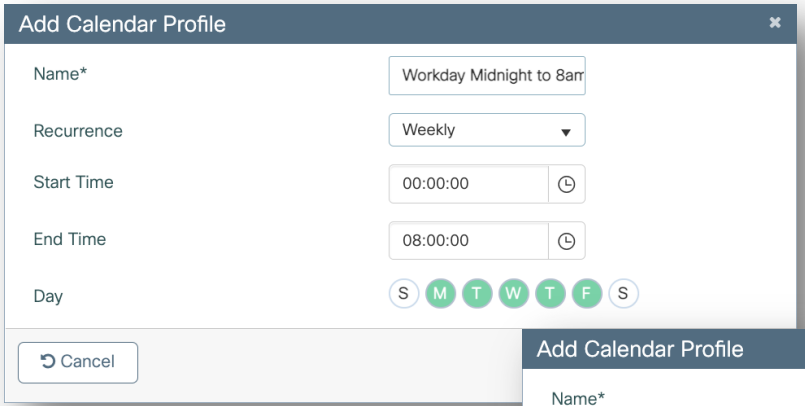


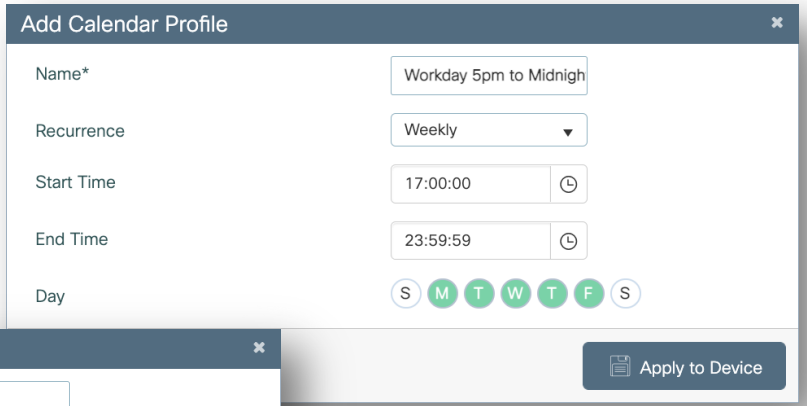
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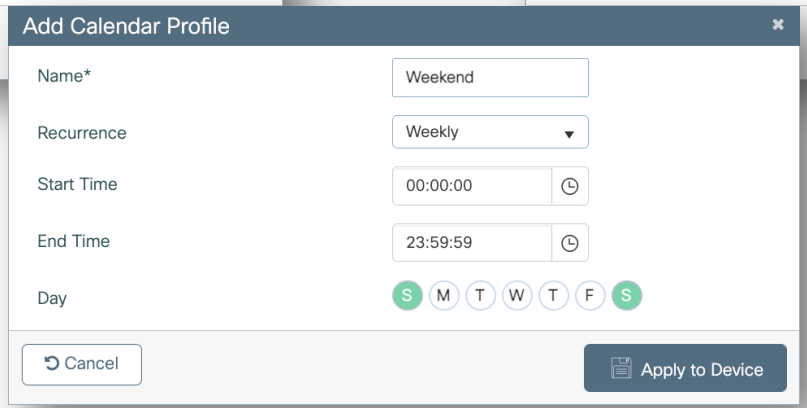
Configuring the Calendar Profile

AP Power Save Only

Configuration → Tags & Profiles → Calendar





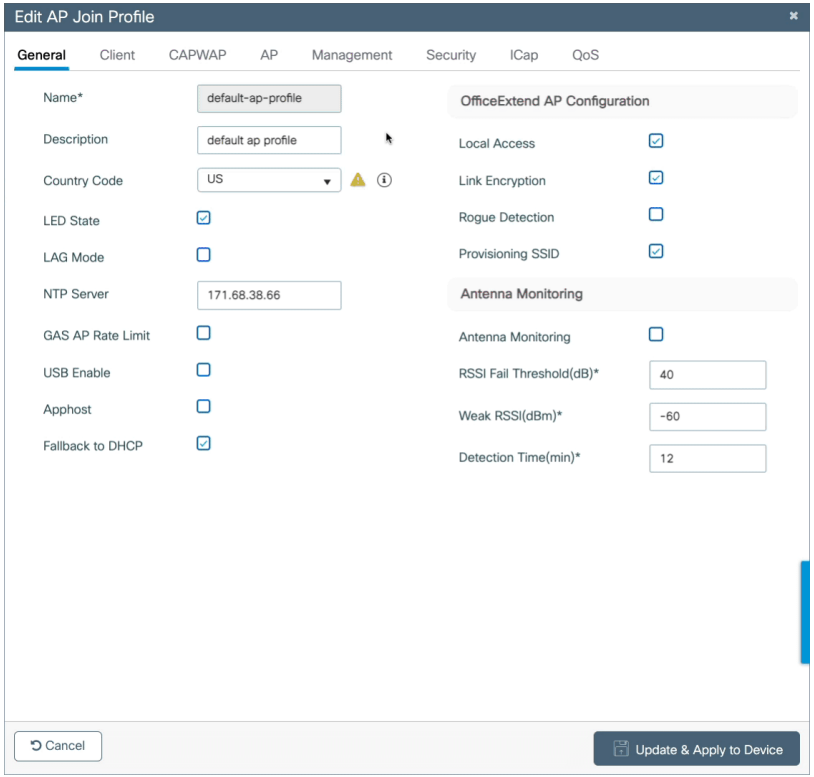


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Mapping the AP Power Profile to Calendar Profiles

AP Power Save Only

Configuration → Tags & Profiles → AP Join

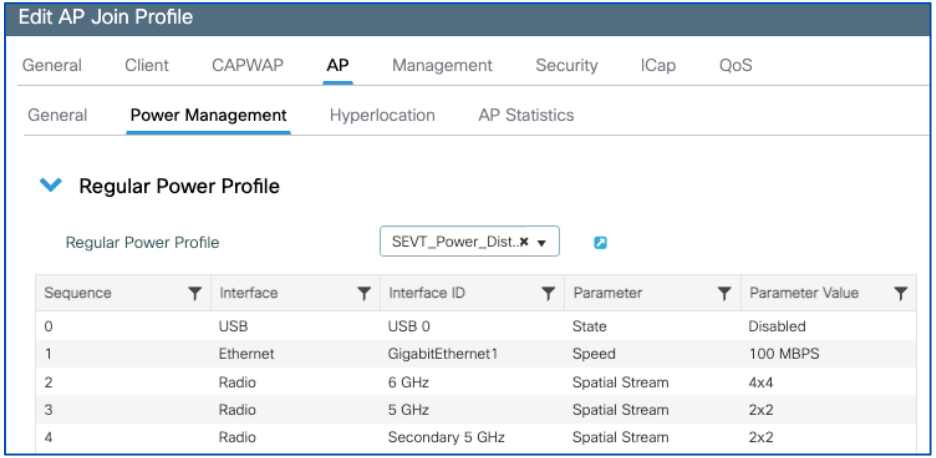


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Configuring a Regular AP Power Profile

AP Power Distribution

Configuration → Tags & Profiles → AP Join

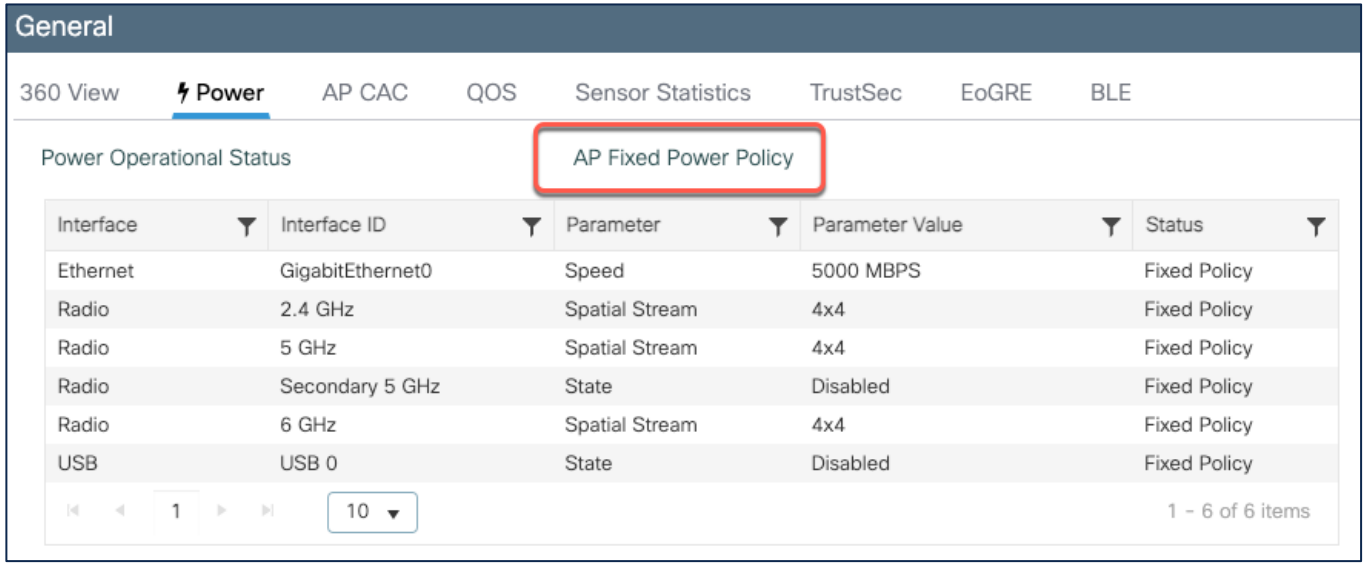


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AP Statistics - Power Status

Power Profile Not Applied - Fixed Power Policy

Monitoring → AP Statistics

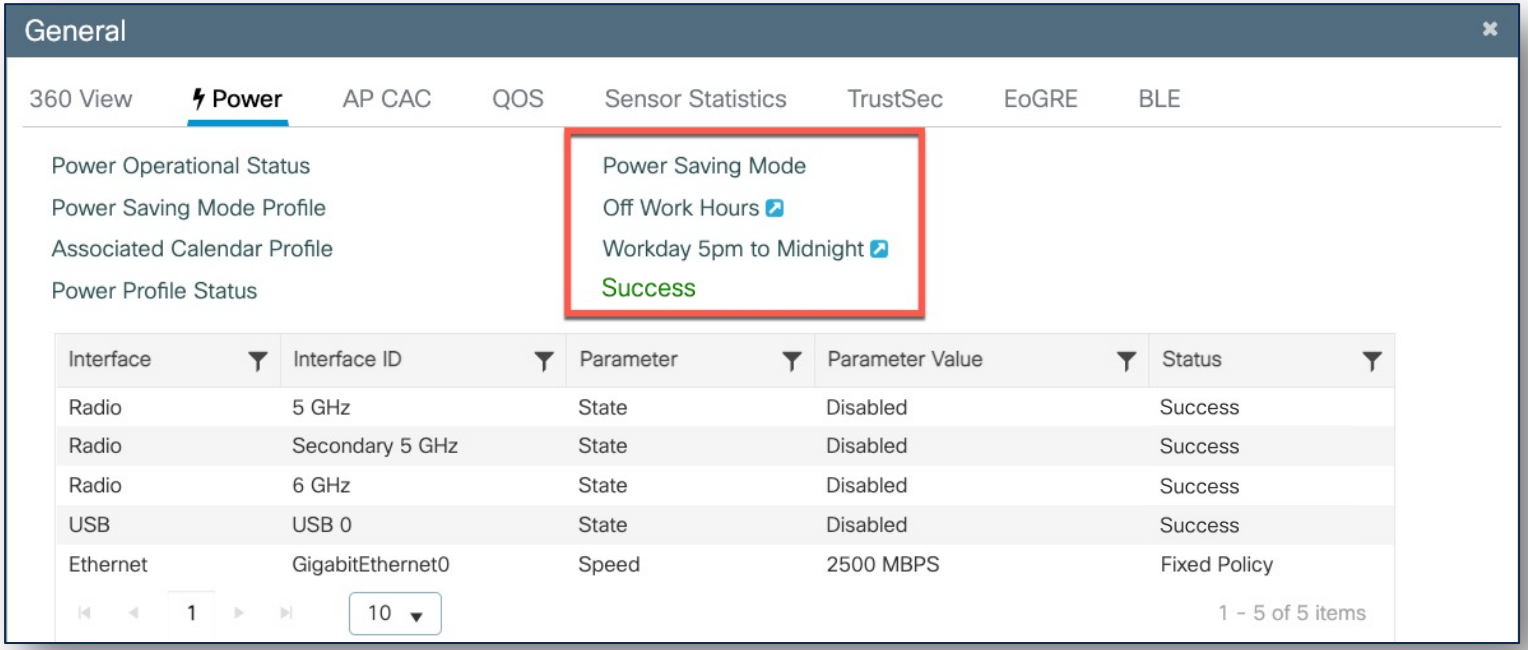


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AP Statistics - Power Status

Power Profile Applied – AP Power Save

Monitoring → AP Statistics

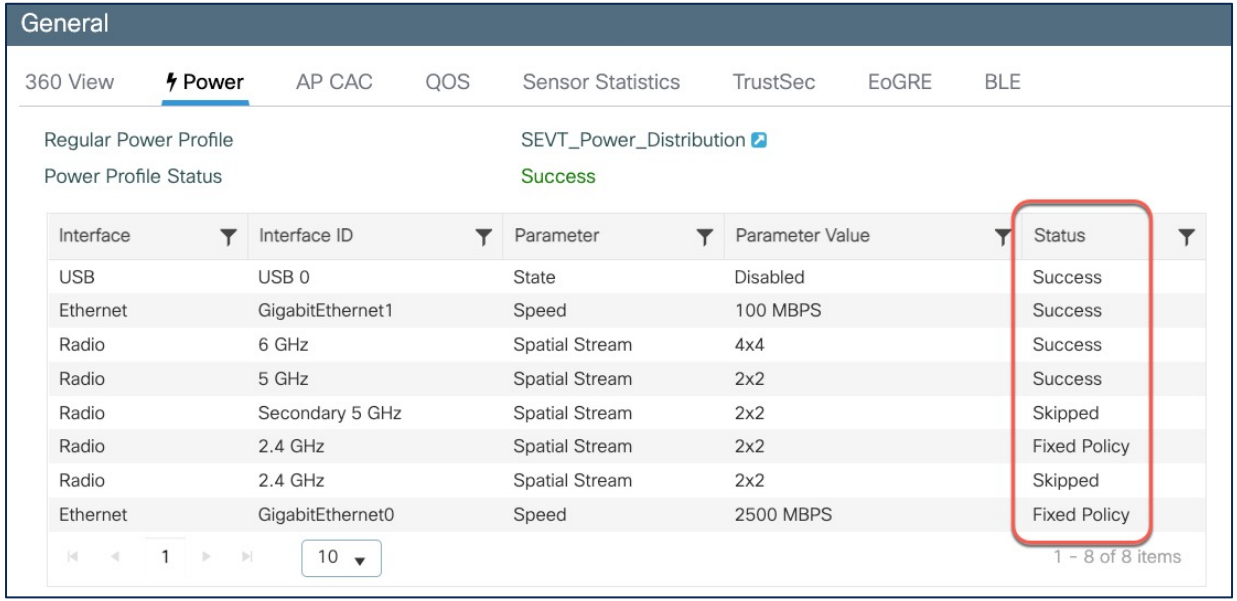


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AP Statistics - Power Status

Power Distribution – Power Profile applied to lower power budget

Monitoring → AP Statistics



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Cisco Learning Network
Resource community portal for certifications and learning

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Cisco Learning Partner Program
Authorized training partners supporting Cisco technology and career certifications

Cisco Instructor-led and Virtual Instructor-led training
Accelerated curriculum of product, technology, and certification courses

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Cisco Certifications and Specialist Certifications
Award-winning certification program empowers students and IT Professionals to advance their technical careers

Cisco Guided Study Groups
180-day certification prep program with learning and support

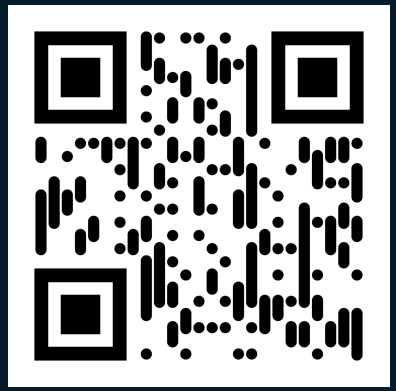
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The bridge to possible

Thank you



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