Wi-Fi 7 Operations

The details of the features supported by the Wi-Fi 7 APs are discussed in the following topics.

Wi-Fi 7 AP

Wi-Fi 7 APs are enterprise wireless networking devices that

- operate across tri-band frequencies (2.4 GHz, 5 GHz, and 6 GHz)
- support interoperability with 802.11ax/ac clients and hybrid deployments, and
- offer multiple radio and antenna modes for regulatory and deployment flexibility.

Cisco Wi-Fi 7 AP models

The Cisco Wireless 9176I Wi-Fi 7 AP, Cisco Wireless 9176D1 Wi-Fi 7 AP, Cisco Wireless 9178I Wi-Fi 7 AP, and Cisco Wireless 9172I Wi-Fi 7 AP, are an enterprise-class tri-band APs that operate across 2.4 GHz, 5 GHz, and 6 GHz frequencies. You can use the AP hardware with Cisco Catalyst Center, Cisco Catalyst stack, and Meraki cloud-based stack.

Operating modes and configuration

From the Cisco IOS-XE 17.15 release, split-PHY mode is supported in Cisco Wireless 9172I Series Wi-Fi 7 APs (CW9172I) radio. The radio on Cisco Wireless 9172I AP operates in the following modes:

- 5 GHz 4x4 (single-PHY)
- 5 GHz 2x2 + 6-GHz 2x2 (split-PHY)

The default mode is 5 GHz 2x2 or 6 GHz 2x2. If the AP operates in a regulatory domain where 6 GHz is not supported, it will operate in the 5 GHz 4x4 mode.

Note If the AP radio power is off, then 802.11be capability of the radio is switched off. For the AP to be 802.11e capable, all radios have to be switched on.

Operating modes and configuration

From the Cisco IOS-XE 17.17 release, Cisco Wireless 9172H Series AP operates in two modes:

- 2.4 GHz(4x4) + 5 GHz(2x2) + 6 GHz(2x2)
- 2.4 GHz(4x4) + 5 GHz full band(4x4)

To access the 5 GHz full band mode(5 GHz radio in 4X4 mode):

- Configure antenna count as 4, under mapped radio profile.
- Disable the 6 GHz radio (slot 2) and reboot the AP.

If you do not reboot the AP, the 5 GHz radios will continue to operate in 2X2 mode even though the antenna count configuration is 4. The AP goes for a reboot when 6 GHz radio is enabled, as it requires a mode switch for the 6 GHz radio bring-up.

Multi-link operation (MLO)

A multi-link operation (MLO) is a wireless networking feature that

- enables multi-link devices (MLDs) to maintain associations and transmit data across multiple frequency bands simultaneously including 2.4 GHz, 5 GHz, and 6 GHz bands
- integrates with the IEEE 802.11be (Wi-Fi 7) protocol to ensure dynamic network optimization, and
- adapts its functionality based on device power mode and protocol activation state.

When you enable the 802.11be (Wi-Fi 7) protocol on your device, MLO capabilities start automatically and network performance improves. If you disable the 802.11be protocol, MLO features will not be available.

Multi-link operation (MLO) modes

There are three widely adapted MLO modes.

- Multi-Link Single Radio (MLSR)
- Enhanced Multi-Link Single Radio (EMLSR)
- Multi-Link Multi Radio (MLMR)

Table 1: Feature history for multi-link operation (MLO)

Feature Name	Release Information	Feature Description
Multi-link operation (MLO)	Cisco IOS XE 17.18.1	Multi-Link Operation (MLO) is now supported even when radios are operating in low power mode. This enhancement ensures seamless multi-link operations under constrained power conditions, providing improved flexibility and efficiency for network operations. This feature is supported on the following access points only: • Cisco Wireless 9178 Series Access Points. • Cisco Wireless 9176 Series Access Points.
Multi-link operation (MLO)	Cisco IOS XE 17.15.2	To alert users about possible disruptions, pop-up notifications or console informational messages will be displayed whenever there are changes to the radio parameters. These messages appear when the workflow is enabled or disabled, or when a radio reset occurs. The lack of support for link reconfiguration in Multi-Link Operation (MLO) may lead to client disruption during radio configuration changes. Disruption will occur for clients connected to an AP with 802.11be enabled radio, especially when 802.11be is enabled across all radio bands.

Multi-link statistics

A multi-link statistics table is a data structure that

- tracks per-link and aggregated performance statistics for multi-link capable wireless clients
- uses the Multi-Link Device (MLD) client's MAC address as a key for identifying statistics, and
- maintains separate per-band statistics as clients connect to or roam between different APs and bands.

The table also provides per-band statistics for non-MLD stations. The table tracks statistics when a non-MLD station moves between bands. When a non-MLD client connects to an MLD AP, the table transfers the aggregated statistics to the per-band statistics section. When an MLD station connects to a non-MLD AP, the table preserves per-band statistics and continues accumulating aggregated statistics.

Note In **Monitoring** > **Wireless** > **Clients** > **General** > **Clients** > **Statistics**, the display of client statistics has been updated. The statistics for Multi-Link Operation (MLO) are grouped by band instead of slot. When client statistics are recorded across multiple bands, the display shows a column for each band. Within each band, a client may be associated with one or more slots. For Non-MLO clients, the display shows aggregated data for the single band each client uses.

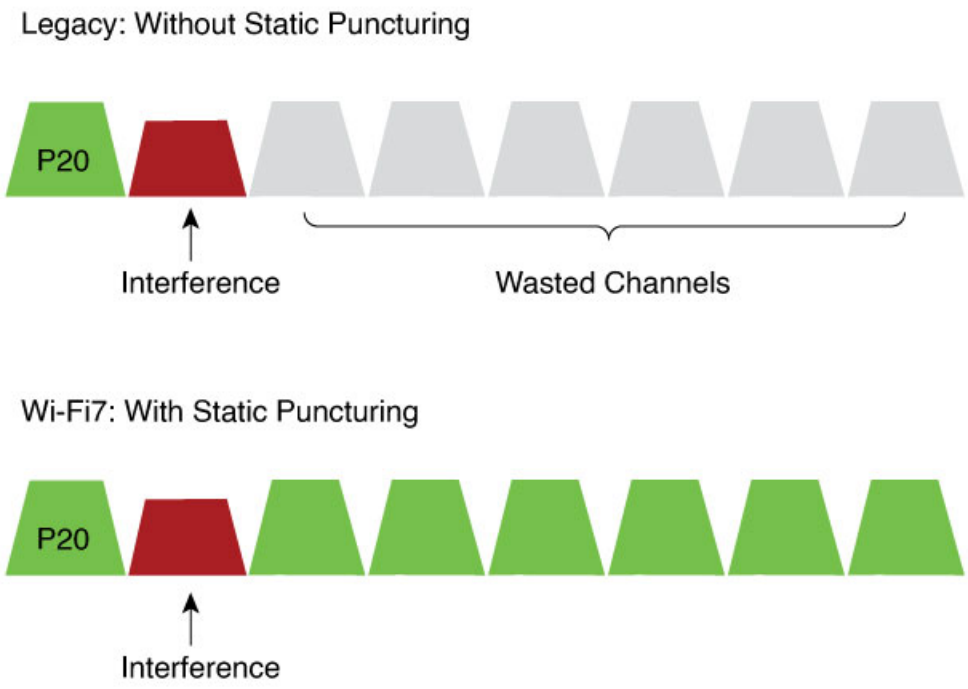
Preamble puncturing

A preamble puncturing is a wireless transmission technique that

- allows Extremely High Throughput (EHT) stations to transmit and receive Physical Layer Protocol Data Units (PPDUs) by omitting signals in unused 20-MHz subchannels even with bandwidth interference like rogue APs, and
- enables efficient spectrum use and adaptability in environments with bandwidth interference or rogue APs.

This technique is standardized for EHT PPDUs with a minimum resolution of 20-MHz. With 320-MHz bandwidth PPDUs, the resolution can go up to 120 MHz. Puncturing is not applied to the primary 20-MHz channel.

Preamble puncturing enables selective signal omission within a PPDU's bandwidth. This allows for no signal in specific 20-MHz subchannels. For EHT PPDUs, the resolution is set at 20 MHz. For 320-MHz PPDUs, the resolution is 40 MHz. The 802.11be standard specifies preamble puncturing for bandwidths of 80 MHz and above. You can configure 20 MHz puncturing for 80 MHz bandwidth, 20 MHz or 40 MHz for 160 MHz, and 40 MHz, 80 MHz, or 120 MHz for 320 MHz bandwidth.



Use cases

The 802.11be standard mandates preamble puncturing for bandwidths of 80 MHz or greater. It specifically describes puncturing scenarios for 80 MHz, 160 MHz, and 320 MHz bandwidths. Key applications include:

- Maximizing 5 GHz Channel Re-Use: RRM punctures secondary channels upon radar detection to maintain connectivity or switches channels to avoid OBSS interference. Note that static puncturing has not been tested for interoperability in the 5 GHz band. Static puncturing is not supported upon radar detection in the 5 GHz band or for standard power with AFC in the 6 GHz band.
- Providing More 240 MHz Channel Options at 6 GHz: Preamble puncturing increases the availability of 240-MHz channels, offering more flexibility for network deployments.

Overall, preamble puncturing is a tactical method for optimizing spectrum use. It increases network adaptability to interference and enhances bandwidth efficiency for a more reliable wireless network.

Preamble puncturing in the controller

You can configure preamble puncturing in the RF profile settings. This configuration is available only for the 5-GHz and 6-GHz band profiles. By default, preamble puncturing is disabled within the RF profile settings. These configurations are not transmitted to APs through CAPWAP payloads. Instead, they appear when you run the detailed **show** command for the RF profile.

It is important to note that these configurations are not transmitted to APs through CAPWAP payloads. Instead, the configuration details are visible when executing the detailed **show** command for the RF profile.

Configure preamble puncturing (GUI)

Enable preamble puncturing on an RF profile to optimize wireless signal transmission.

Procedure

Step 1 Choose **Configuration** > **Tags & Profiles** > **RF/Radio**.

The **RF** window is displayed with a list of profiles.

Step 2 Click **Add**.
The **Add RF Profile** window is displayed.

Step 3 Click the **802.11be** tab.

Step 4 Toggle the button to enable **Preamble Puncturing**.

Step 5 Click **Apply to Device**.

Configure preamble puncturing (CLI)

You can configure preamble puncturing only in the 5 GHz and 6 GHz bands. By default, preamble puncturing is disabled in the RF profile.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure an RF profile and enter the RF profile configuration mode.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz | 6ghz} rf-profile rf-preamble-name
```

Step 3 Configure preamble puncturing.

Example:

```
Device(config-rf-profile)# preamble puncturing
```

Configure 802.11be network parameters (CLI)

Set up 802.11be (Wi-Fi 7) network parameters on your device using commands.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Disable the 802.11b/g network, if you use 2.4 GHz, 5 GHz or 6 GHz.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz | 6ghz} shutdown
```

Step 3 Configure the 802.11be network.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz | 6ghz} dot11be
```

Step 4 Enable the 802.11b/g network, if you use 2.4 GHz, 5GHz or 6GHz.

Example:

```
Device(config)# no ap dot11 {24ghz | 5ghz | 6ghz} shutdown
```

Configure 802.11be network parameters (GUI)

Set up high throughput features for your wireless network by enabling and configuring 802.11be (Wi-Fi 7) options across supported frequency bands.

Procedure

Step 1 Choose **Configuration** > **Radio Configurations** > **High Throughput**.

Step 2 Click the **6 GHz Band**, **5 GHz Band** or **2.4 GHz Band** tab.

a) Check the check box to enable **802.11be**.
b) In the **A-MPDU Tx** section, check the check boxes to set the desired priority levels.
c) In the **A-MSDU Tx** section, check the check boxes to set the desired priority levels.

Step 3 Click on the **5 GHz Band** tab and in the **A-MPTDU Tx** section, and complete these:

a) Enter the value in the field to set the **Window Size**.
b) Toggle the button to enable the **Aggregation Scheduler**.
c) Select either **Automatic**, **Enabled**, or **Disabled** in the **Frame Burst** drop-down list.
d) Enter the value in the **Realtime Traffic Timeout** field. The default value is 10.

Step 4 Click the **2.4 GHz Band** tab.

Step 5 In the **A-MPTDU Tx** section, complete these:

a) Enter the value in the field to set the **Window Size**.
b) Toggle the button to enable the **Aggregation Scheduler**.

c) Enter the value in the **Realtime Traffic Timeout** field. The default value is 10.

Step 6 Click **Apply**.

Configure A-MPDU window size in RF radio profile (GUI)

Change the A-MPDU window size to optimize wireless performance for an RF radio profile.

Procedure

Step 1 Choose **Configuration** > **Tags & Profiles** > **RF/Radio**.

The **RF** window is displayed with list of profiles.

Step 2 Click **Add**.
The **Add RF Radio Profile** window is displayed.

Step 3 Enter an RF profile name in the **General** tab.

Step 4 Click the **Advanced** tab.

Step 5 In the **A-MPDU Window Size** field enter the value.

The valid range is between one to 255. The default value is 255.

Step 6 Click **Apply to Device**.

Configure A-MPDU window size in RF radio profile (CLI)

Set the compressed block acknowledgment (block-ack) window size for 802.11 transmit aggregated MAC protocol data units (A-MPDU) in a specific RF profile.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure an RF profile for 2.4 GHz, 5 GHz, or the 6 GHz band.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz | 6ghz} rf-profile block-ack-rf-profile
```

Step 3 Configure 802.11 transmit A-MPDU window size.

Example:

```
Device(config-rf-profile)# dot11 a-mpdu tx block-ack window-size 255
```

Enable or disable client serving on AP (GUI)

Use this task to enable or disable client serving on an AP from the GUI.

Before you begin

Change the AP mode to **Client Serving**.

Procedure

Step 1 Choose **Configuration** > **Wireless** > **Access Points**.

Step 2 Click the AP name from the 6 GHz, 5 GHz, or 2.4 GHz list on the **Access Points** page.

Step 3 Select the **Assignment Method** as *Client Serving* in the **Role Assignment** section.

Note
You can edit this section only if the **Assignment Method** is set to **Custom**.

Step 4 Configure these in the **RF Channel Assignment** section:

- Select the Channel Width from the **RF Channel Width** drop-down list.
- Select the type of assignment from the **Assignment Method** drop-down list.

Note
If you choose **Custom**, you must select a channel width and specify an RF channel number to the AP radio. A 320 MHz channel width is supported from the Cisco IOS XE 17.15.1 onwards.

Step 5 Click **Update & Apply to Device**.

Configure 802.11be MCS rates (CLI)

Configure the modulation and coding scheme (MCS) transmission rates for 802.11be (Wi-Fi 7) APs using commands.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure the 802.11be parameters.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz | 6ghz} dot11be
```

Step 3 Enable the 802.11be 2.4 GHz, 5 GHz, or 6 GHz band modulation and coding scheme (MCS) transmission rates.

Example:

```
Device(config)# ap dot11 {24ghz | 5ghz | 6ghz} dot11be mcs tx index {11 | 13 | 14 | 15 |
9} spatial-stream spatial-stream-value
```

Configure 802.11be radio parameter frequencies (GUI)

Set data rates and enable 802.11be features on supported frequency bands.

Procedure

Step 1 Choose **Configuration** > **Radio Configurations** > **High Throughput**.

Step 2 Choose the **6 GHz Band** or **5 GHz Band** or **2.4 GHz Band** tab.

a) Expand the **11be** section.
b) Check the **Enable 11be** check box, if required.
c) Check either the **Select All** check box to configure all the data rates or select the desired options from the available data rates list.

Step 3 Click **Apply**.

Configure multi BSSID 802.11be parameters (GUI)

Configure advanced 802.11be parameters within a multi BSSID profile to manage Orthogonal frequency-division multiple access (OFDMA) and MU-MIMO settings.

Procedure

Step 1 Choose **Configuration** > **Tags & Profiles** > **Multi BSSID**.

Step 2 Click **Add**.
The **Add Multi BSSID Profile** window is displayed.

Step 3 Enable or disable the following parameters in the **802.11be** section:

- **OFDMA Downlink**
- **OFDMA Uplink**

- **MU-MIMO Downlink**
- **MU-MIMO Uplink**
- **OFDMA Multi-RU**

Note
OFDMA Downlink and **OFDMA Uplink** are enabled by default.

Step 4 Click **Apply to Device**.

Configure multi BSSID 802.11be parameters (CLI)

Note Multi-BSSID profile configuration overwrites the 802.11be profile configuration for 6-GHz band.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure the multi BSSID profile and enter the multi BSSID profile configuration.

Example:

```
Device# wireless profile multi-bssid default-multi-bssid-profile
```

Step 3 Configure the 802.11be parameters.

Example:

```
Device# dot11be {downlink-mumimo | downlink-ofdma | ofdma-multi-ru | uplink-mumimo |
uplink-ofdma}
```

Configure 802.11be parameters (GUI)

Modify 802.11be profile parameters to optimize wireless performance for specific user profiles.

Procedure

Step 1 Choose **Configuration** > **Tags & Profiles** > **802.11be**.

The different user profiles are listed.

Step 2 Click the required profile.

The **Edit 802.11be Profile** window is displayed.

Step 3 Click to **Enable** or **Disable** the **OFDMA Downlink**, **OFDMA Uplink**, **MU-MIMO Downlink**, **MU-MIMO Uplink**, and **OFDMA Multi-RU** in the **Edit 802.11be Profile** window.

Step 4 Click **Update and Apply to Device**.

Monitor 5 GHz radio WLAN slot data (GUI)

View and confirm the WLAN ID, BSSID MAC, and MLD MAC information for APs operating on the 5 GHz radio.

Procedure

Step 1 Choose **Monitoring** > **Wireless** > **Radio Statistics**.

Step 2 Click the **5 GHz Radios** tab, then select the required AP.

Step 3 Verify the **WLAN ID**, **BSSID MAC**, and **MLD MAC** in the **WLAN Slot Data** section.

The **5 GHz Band** window is displayed.

Step 4 Click **OK**.

Monitor 802.11be radio parameters (GUI)

View and verify preamble puncturing parameters for 802.11be radios in the wireless monitoring dashboard.

Procedure

Step 1 Choose **Monitoring** > **Wireless** > **Radio Statistics**.

Step 2 Click the **6 GHz Radios** tab and select the required AP.

Step 3 Verify these to monitor preamble puncturing in the **11be Parameters** section:

a) **Puncture Reason**

b) **Punctured Channels**

Step 4 Click **OK**.

Verify multi-link statistics

Verify wireless client MAC address details

To verify the wireless client mac-address mobility history, use the command:

```
Device# #show wireless client mac-address e460.17bb.3a50 mobility history

Recent association history (most recent on top):

AP Name                                      BSSID           AP Slot    Assoc Time
        Instance   Mobility Role   Run Latency (ms)     Dot11 Roam Type
-------------------------------------------------------------------------------------------------------------
WiFi7_AP1_2036                              c614.a26e.c218  1          11/21/2024 18:15:20
      0          Local           4001                N/A
```

To verify the wireless client mac-address, use the command:

```
Device# show wireless client mac-address e460.17bb.3a50 detail

Client MAC Address : e460.17bb.3a50
Client MAC Type : Universally Administered Address
Client DUID: NA
Client IPv4 Address : 198.51.100.10
Client IPv6 Addresses : fe80::8359:7407:bb2b:ee9e
                        2001:DB8::1
                        2001:DB8::2
                        2001:DB8::3
Client Username: N/A
AP MAC Address : c414.a26e.c200
AP Name: WiFi7_AP1_2036
AP slot : 1
Client State : Associated
Policy Profile : LOCAL_PP_1
Flex Profile : N/A
Multilink Client : Yes
Wireless LAN Id: 91
WLAN Profile Name: W7_WPA3_SAE
Wireless LAN Network Name (SSID): W7_WPA3_SAE
BSSID : c614.a26e.c218
Connected For : 259 seconds
Protocol : 802.11be
Channel : 36
Client IIF-ID : 0xa0000002
Association Id : 33
Authentication Algorithm : Simultaneous Authentication of Equals (SAE)
Idle state timeout : N/A
Session Timeout : 3000 sec (Remaining time: 2745 sec)
Session Warning Time : Timer not running
Input Policy Name  : None
Input Policy State : None
Input Policy Source : None
Output Policy Name  : None

Output Policy State : None
Output Policy Source : None
WMM Support : Enabled
U-APSD Support : Disabled
Fastlane Support : Disabled
Client Active State : Active
Power Save : OFF
Current Rate : m12 ss2
```

```
Supported Rates : 6.0,9.0,12.0,18.0,24.0,36.0,48.0,54.0
AAA QoS Rate Limit Parameters:
  QoS Average Data Rate Upstream             : 0 (kbps)
  QoS Realtime Average Data Rate Upstream    : 0 (kbps)
  QoS Burst Data Rate Upstream               : 0 (kbps)
  QoS Realtime Burst Data Rate Upstream      : 0 (kbps)
  QoS Average Data Rate Downstream           : 0 (kbps)
  QoS Realtime Average Data Rate Downstream  : 0 (kbps)
  QoS Burst Data Rate Downstream             : 0 (kbps)
  QoS Realtime Burst Data Rate Downstream    : 0 (kbps)
Mobility:
  Move Count                  : 0
  Mobility Role               : Local
  Mobility Roam Type          : None
  Mobility Complete Timestamp : 11/21/2024 18:15:23 UTC
Client Join Time:
  Join Time Of Client : 11/21/2024 18:15:20 UTC
Client State Servers : None
Client ACLs : None
Policy Manager State: Run
Last Policy Manager State : IP Learn Complete
Client Entry Create Time : 256 seconds
Policy Type : WPA3
Encryption Cipher : CCMP (AES)
Authentication Key Management : SAE
AAA override passphrase : No
SAE PWE Method : Hash to Element(H2E)
Transition Disable Bitmap : 0x00
Beacon Protection : No
User Defined (Private) Network : Disabled
User Defined (Private) Network Drop Unicast : Disabled
Encrypted Traffic Analytics : No
Protected Management Frame - 802.11w : Yes
EAP Type : Not Applicable
VLAN Override after Webauth : No
VLAN : 129
Multicast VLAN : 0
VRF Name : N/A
WiFi Direct Capabilities:
  WiFi Direct Capable           : No
Central NAT : DISABLED
Session Manager:
  Point of Attachment : capwap_90000019
  IIF ID              : 0x90000019
  Authorized          : TRUE
  Session timeout     : 3000
  Common Session ID: 1E800709000000384FEF901E
  Acct Session ID  : 0x00000000
  Auth Method Status List
        Method : SAE
  Local Policies:
        Service Template : wlan_svc_LOCAL_PP_1_local (priority 254)
                VLAN            : 129
                Absolute-Timer   : 3000
  Server Policies:
  Resultant Policies:
                VLAN Name        : VLAN0129
                VLAN             : 129
                Absolute-Timer   : 3000
DNS Snooped IPv4 Addresses : None
DNS Snooped IPv6 Addresses : None
Client Capabilities
  CF Pollable : Not implemented
  CF Poll Request : Not implemented
```

```
  Short Preamble : Not implemented
  PBCC : Not implemented
  Channel Agility : Not implemented
  Listen Interval : 0
Fast BSS Transition Details :
  Reassociation Timeout : 0
11v BSS Transition : Implemented
11v DMS Capable : No
QoS Map Capable : No
FlexConnect Data Switching : N/A
FlexConnect Dhcp Status : N/A
FlexConnect Authentication : N/A
Client Statistics:
  Number of Bytes Received from Client : 137038
  Number of Bytes Sent to Client : 39468
  Number of Packets Received from Client : 1064
  Number of Packets Sent to Client : 237
  Number of Data Retries : 0
  Number of RTS Retries : 0
  Number of Tx Total Dropped Packets : 0
  Number of Duplicate Received Packets : 0
  Number of Decrypt Failed Packets : 64
  Number of Mic Failured Packets : 0
  Number of Mic Missing Packets : 0
  Number of Policy Errors : 0
  Radio Signal Strength Indicator : -46 dBm
  Signal to Noise Ratio : 51 dB
  Last statistics update : 11/21/2024 18:18:18
  Number of links dropped due to downsizing : 0
  Client Statistics per band:
    Radio Band 5GHz
    Station Link MAC Address: e660.17bb.3a53
      AP slot : 1
      Number of Bytes Received from Client : 137038
      Number of Bytes Sent to Client : 39468
      Number of Packets Received from Client : 1064
      Number of Packets Sent to Client : 237
      Number of Data Retries : 0
      Number of RTS Retries : 0
      Number of Tx Total Dropped Packets : 0
      Number of Duplicate Received Packets : 0
      Number of Decrypt Failed Packets : 64
      Number of Mic Failured Packets : 0
      Number of Mic Missing Packets : 0
      Number of Policy Errors : 0
      Radio Signal Strength Indicator : -46 dBm
      Signal to Noise Ratio : 51 dB
      Last statistics update : 11/21/2024 18:18:18
    Radio Band 2.4GHz
    Station Link MAC Address: e660.17bb.3a54
      AP slot : 0
      Number of Bytes Received from Client : 0
      Number of Bytes Sent to Client : 0
      Number of Packets Received from Client : 0
      Number of Packets Sent to Client : 0
      Number of Data Retries : 0
      Number of RTS Retries : 0
      Number of Tx Total Dropped Packets : 0
      Number of Duplicate Received Packets : 0
      Number of Decrypt Failed Packets : 0
      Number of Mic Failured Packets : 0
      Number of Mic Missing Packets : 0
      Number of Policy Errors : 0
      Radio Signal Strength Indicator : Unavailable
```

```
      Signal to Noise Ratio : Unavailable
      Last idle time update : Never
Fabric status : Disabled
Radio Measurement Enabled Capabilities
  Capabilities: Neighbor Report, Passive Beacon Measurement, Active Beacon Measurement,
Table Beacon Measurement
Client Scan Report Time : Timer not running
Client Scan Reports
Assisted Roaming Neighbor List
Nearby AP Statistics:
EoGRE : Pending Classification
Max Client Protocol Capability: Wi-Fi 7 (802.11be)
WiFi to Cellular Steering : Not implemented
Cellular Capability : N/A
Advanced Scheduling Requests Details:
  Apple Specific Requests(ASR) Capabilities/Statistics:
    Regular ASR support: DISABLED
L3 Access : DISABLED
Client Gateway IPv4 Address : 198.51.100.1
Multi Link Information:
  Enhanced Multi Link    : EMLSR
  STR Capable            : No
  No. of associated links: 2
  Associated Links
    Band : 5 GHz
      MAC Address: e660.17bb.3a53
      BSSID: c414.a26e.c207
    Band : 2.4 GHz
      MAC Address: e660.17bb.3a54
      BSSID: c414.a26e.c208
Known Link Information:
  No. of Known links: 2
  Known Links
    Band : 5 GHz
      MAC Address: e660.17bb.3a53
    Band : 2.4 GHz
      MAC Address: e660.17bb.3a54
```

Verify wireless client summary

To verify the wireless client summary, use the command:

```
Device# show wireless client summary
Number of Clients: 1

MAC Address    AP Name                                          Type ID   State
Protocol   Method     Role
-------------------------------------------------------------------------------------
e460.17bb.3a50 WiFi7_AP1_2036                                   WLAN 91   Run
11be(MLO)  SAE        Local
```

Verify wireless summary

To verify the wireless summary, use the command:

```
Device# show wireless summary

Priming controller         : DISABLED
Max APs supported          : 2000
Max clients supported      : 32000

Access Point Summary

                     Total    Up    Down
```

```
----------------------------------------
802.11 2.4GHz             1     1       0
802.11 5GHz               3     1       2
802.11 6GHz               1     0       1
802.11 dual-band          1     0       1
802.11 dual-band(5/6GHz)  0     0       0
802.11 rx-dual-band       0     0       0

Client Serving(2.4GHz)    2     1       1
Client Serving(5GHz)      3     1       2
Client Serving(6GHz)      1     0       1
Monitor(Dual band)        0     0       0
Monitor(2.4GHz)           0     0       0
Monitor(5GHz)             0     0       0
Monitor(6GHz)             0     0       0
Sniffer(Dual band)        0     0       0
Sniffer(2.4GHz)           0     0       0
Sniffer(5GHz)             0     0       0
Sniffer(6GHz)             0     0       0

Client Summary

  Total Clients : 1
  Excluded      : 0
  Disabled      : 0
  Foreign       : 0
  Anchor        : 0
  Local         : 1
```

Verify 802.11be parameters

Verify 802.11be profile details

To display the 802.11be profile details, run the command:

```
Device# show dot11be profile detailed
Dot11be profile name : sample_11be_profile
------------------------------------------------------------
Description : sample_11be_profile
802.11be parameters
OFDMA Downlink : Enabled
OFDMA Uplink : Enabled
OFDMA Multi-RU : Enabled
MU-MIMO Downlink : Enabled
MU-MIMO Uplink : Enabled
```

Verify 802.11 profile summary

To display the 802.11be profile summary, run the command:

```
Device# show dot11be profile summary
Number of dot11be profiles: 1
Dot11be profile name              Description
------------------------------------------------------------------------
default-dot11be-profile           Default 802.11be profile
```

Verify 320 MHz details (GUI)

Note

- 320 MHz is supported only on the 6-GHz band.
- By default, the Dynamic Channel Assignment (DCA) maximum bandwidth is 160 MHz. Users need to enable 320 MHz in the 6-GHz RF Profile to utilize it.

Confirm that 320 MHz operation is enabled and functioning on the 6 GHz band by reviewing channel request and response data in the GUI.

Procedure

Step 1 Choose **Monitoring** > **Wireless** > **AP Statistics**.

Step 2 Select **General**.

A list of APs under the **General** tab is displayed.

Step 3 Select the required profile from the list.

A **General** window is displayed.

Step 4 Select **AFC** and then choose **Request**.

Step 5 Verify the **320 MHz Channel Request Data** from the **Channel Request Data** table.

Step 6 Select **AFC** and then choose **Response**.

Step 7 Verify the **320 MHz Channel Response Data** from the **Channel Response Data** table.

Verify multi BSSID details

Verify multiple link device (MLD) MAC details

To display the 802.11be profile details, run the command:

```
Device# show ap name cisco-ap wlan dot11 5ghz
-------------------------------------------------------------
Slot id : 1
WLAN ID BSSID MLD
-----------------------------------------------------
9 0aef.2500.010f 0aef.2501.0001
2 0aef.2500.010e 0aef.2501.0002
3 0aef.2500.010d 0aef.2501.0003
4 0aef.2500.010c 0aef.2501.0004
12 0aef.2500.010b 0aef.2501.0005
14 0aef.2500.010a 0aef.2501.0006
16 0aef.2500.0109 NA
```

Verify multi BSSID set ID and Tx VAP indicator details for 6 GHz radio

To display the 802.11be profile details, run the command:

```
Device# show ap name WSIM-AP-0001 wlan dot11 6ghz
-------------------------------------------------------------
Slot id : 3
WLAN ID BSSID MLD MBSSID Set ID
-------------------------------------------------------------------------
9 0aef.2500.0108 0aef.2501.0001 1*
2 0aef.2500.0109 0aef.2501.0002 1
3 0aef.2500.010a 0aef.2501.0003 1
4 0aef.2500.010b 0aef.2501.0004 1
12 0aef.2500.010c 0aef.2501.0005 NA (11be WLAN not 6GHz compliant)
14 0aef.2500.010d 0aef.2501.0006 2*
16 0aef.2500.010e NA 3* (11ax 6GHz WLAN)
18 0aef.2500.010f NA NA (11ax non-6GHz WLAN)
```

Feature history for per WLAN Wi-Fi 7 toggle

This table provides release and related information for the feature explained in this module.

This feature is also available in all the releases subsequent to the one in which they are introduced in, unless noted otherwise.

Table 2: Feature history for access point upgrade management enhancements

Release	Feature Information
Cisco IOS XE 17.18.1	Per-WLAN 802.11be configuration is an enhancement in WLAN configurations that provides: • WLAN level control for 802.11be (Wi-Fi 7) configurations. • The ability to enable or disable 802.11 be (Wi-Fi 7) on a per WLAN basis. • Support for running both Wi-Fi 7 and non-Wi-Fi 7 WLANs simultaneously on the same radio frequency band.

Per-WLAN 802.11be configuration

Per-WLAN 802.11be configuration is an enhancement in WLAN configurations.

- It introduces WLAN-level control for 802.11be configurations.
- This capability supports both 802.11be and non-802.11be WLANs in the same radio frequency band.
- The configuration offers greater flexibility compared to previous versions.

Starting with Cisco IOS XE 17.18.1 release, you can enable or disable Wi-Fi 7 (802.11be) on a per WLAN basis. This change allows you to run both Wi-Fi 7 and non-Wi-Fi 7 WLANs simultaneously on the same radio band. It offers more flexibility compared to previous releases, where Wi-Fi 7 was configured as a global radio setting.

Upon upgrading to release 17.18.1, a default 802.11be profile is automatically created. This profile enables 802.11be on all bands (2.4 GHz, 5 GHz primary and secondary, and 6 GHz). You can configure custom 802.11be profiles starting from release 17.18.1.

Caution Modifying the default 802.11be profile affects the configuration across all bands where it is enabled.

Supported WLANs

WLANs with below security configuration combinations can operate in Wi-Fi 7 mode:

- WPA3-SAE-EXT-KEY/WPA3-SAE-EXT-KEY-FT + WPA3-SAE/WPA3-SAE-EXT + GCMP256 + AES
- WPA3-802.1x-SHA256/WPA3-SuiteB-192 + WPA2-802.1x + AES/GCMP256
- PMF Required/Optional

Note WLANs that are not compatible with Wi-Fi 7 security restrictions are automatically downgraded to the 802.11ax mode. This process ensures that these WLANs remain operational even when Wi-Fi 7 is enabled globally.

Supported security configurations for 802.11be

Table 3: Security configurations

Security combination	AKM/Cipher	PMF (802.11w required/optional)	Beacon
WPA3-OWE + GCMP256	OWE + GCMP256 + AES	Yes	MLO + EHT (11be); No OWE element
WPA3 + WPA2	• 802.1x + 802.1x-sha256 • 802.1x + suite-b-192 • 802.1x-FT + 802.1x-sha256	Yes	MLO + EHT

Security combination	AKM/Cipher	PMF (802.11w required/optional)	Beacon
WPA3	• 802.1x-sha256, 802.1x-FT • Suite B - 192 Bit Security • SAE-EXT/SAE-EXT-FT + GCMP256 + AES	Yes	MLO + EHT
WPA3+WPA2	SAE/SAE-FT+H2E + AES + SAE-EXT/SAE-EXT-FT + GCMP256	Yes	MLO + EHT
WPA3 OWE Transition Mode	• OWE WLAN: OWE + GCMP256 • OWE WLAN: OWE+AES+GCMP256	Yes	MLO + EHT
Wi-Fi 7 compliant security + non-compliant security	Wi-Fi 7 compliant security + non-compliant WPA3 security	Yes	MLO + EHT
WPA3 OWE	OWE + AES/GCMP256	Yes	MLO + EHT

Note OWE transition WLAN(Wi-Fi Enhanced Open Transition Mode) configuration is not supported for Wi-Fi 7(802.11be) WLANs.

Beacon-Protection status

If 802.11be is enabled and WLAN security meets the 802.11be requirement, Beacon-Protection is auto-enabled.

Note Beacon-Protection is a mandatory configuration for Wi-Fi 7(802.11be) WLANs.

MBSSID

MBSSID SET-ID

WLANs are arranged into compatible MBSSID (Multiple Basic Service Set Identifier) sets. The placement of each WLAN in an MBSSID set determines the VAP ID or BSSID MAC address. The 6-GHz band supports up to 16 WLANs. Therefore, four MBSSID sets with four WLANs in each group is automatically created. In each group, one WLAN is the Tx-VAP and the other three are non-Tx-VAP.

The grouping is done based on 802.11be against 802.11ax profile WLANs and whether it is a GCMP-128 against GCMP-256 cipher WLAN.

MBSSID grouping for 802.11be and non 802.11be deployments

MBSSID grouping for non 802.11be deployments:

The configuration options when grouping WLANs into an MBSSID set are:

- 6 GHz policy (applicable or not applicable).
- Beacon protection state.
- Configure the cipher to use either 128-bit or 256-bit encryption when beacon protection is enabled.

MBSSID grouping for 802.11be deployments:

The configuration options when grouping WLANs into an MBSSID set are:

- 6 GHz policy (applicable or not applicable).
- The PHY mode for the 6 GHz slot in the corresponding 802.11be profile is either 802.11be or 802.11ax.
- Configure the cipher to use either 128-bit or 256-bit encryption.

Note Beacon-protection is enabled for 802.11be deployments.

Disabled - no MBSSID slot

The WLAN is disabled in the 6 GHz band because there is no available MBSSID slot to accommodate it. This occurs due to MBSSID limitations or conflicting configurations. If the controller fails to map a WLAN into any of the four groups, it is marked as Disabled on the 6 GHz band by the system.

Note This change does not affect the 2.4 GHz or 5 GHz bands.

Tx-VAP WLAN of MBSSID set for 6 GHz band

The VAP within an MBSSID set transmits beacon frames for the group. In 802.11ax and 802.11be networks, multiple WLANs can be grouped into an MBSSID set to increase efficiency. The Tx-VAP sends beacon frames for the entire set. An asterisk (*) identifies the VAP that transmits beacon frames for the group.

The WLAN per-link configuration determines the VAP mode when 802.11be is enabled at the radio band level.

These conditions confirm the BSSID type as 802.11be or non 802.11be:

- If 802.11be is enabled at both the band and WLAN levels, the BSSID is 802.11be.
- If 802.11be is enabled at the band level but disabled at the WLAN level, the BSSID is non-802.11be.
- If 802.11be is disabled at the band level, all BSSIDs on that radio are non-802.11be, regardless of the WLAN per-link configuration.

Create a new 802.11be profile (GUI)

Create a new 802.11be profile to to enable Wi-Fi 7 (802.11be) configuration using the GUI.

Procedure

Step 1 Choose **Configuration** > **Tags & Profiles** > **802.11be**.

Step 2 Click **Add**.

Step 3 In the **Add 802.11be Profile** page, add the **Profile Name** and **Description**.

Step 4 In the **MLO group** section, use the toggle button to either enable or disable the **Primary 2.4GHz**, **Primary 5GHz**, **Secondary 5GHz** and **Primary 6GHz** bands.

Step 5 Click **Apply to Device**.

Map the 802.11be profile to a WLAN (GUI)

Map the new 802.11be profile to a specific WLAN.

Procedure

Step 1 Choose **Configuration** > **Tags and Profiles** > **WLANs**.

Step 2 Select the WLAN and click the **Advanced** tab.
The **Advanced** tab is displayed.

Step 3 Scroll down to the **11be** section.

Step 4 From the **802.11be Profile** drop-down list, select the required WLAN.

Step 5 Click **Update & Apply to Device**.

Create and map 802.11be profile (CLI)

Create a 802.11be profile using the CLI.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure and name the wireless 802.11be profile.

Example:

```
Device(config)# wireless profile dot11be 802.11be-prof-name
```

Step 3 Configure MLO group settings for each radio link.

Example:

```
Device(config-wireless-dot11be-profile)# mlo-group {24ghz | 5ghz | 5ghz-sec | 6ghz}
```

The options are:

- **24ghz**: Enable 2.4 GHz in MLO group.
- **5ghz**: Enable 5 GHz in MLO group.
- **5ghz-sec**: Enable secondary 5 GHz in MLO group.
- **6ghz**: Enable 6 GHz in MLO group.

Note
Use the **no** form of this command to disable MLO group settings for each radio link, that is for 2.4 GHz, 5 GHz, secondary 5 GHz, and 6 GHz radio links, respectively.

```
Device(config-wireless-dot11be-profile)# mlo-group {no-24ghz | no-5ghz  | no-5ghz-sec |
no-6ghz}
```

Step 4 Exit to global configuration mode.

Example:

```
Device(config-wireless-dot11be-profile)# exit
```

Map the 802.11be Profile to a WLAN

Map the 802.11be profile using the CLI.

Procedure

Step 1 Enter the global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure the WLAN profile.

Example:

```
Device(config)# wlan wlan-profile-name
```

This command configures the WLAN profile and enters the WLAN configuration mode.

Step 3 Disable the WLAN profile.

Example:

```
Device(config-wlan)# shutdown
```

Step 4 Configure 802.11be profile for this WLAN.

Example:

```
Device(config-wlan)# [no] dot11be-profile dot11be-prof-name
```

Use the **no** form of this command to disable this feature.

Verify 802.11be profile details

To verify 802.11be profile details, run the **show wireless profile dot11be summary** command.

```
Device# show wireless profile dot11be summary
Number of dot11be profiles: 7

Dot11be profile name              Description
------------------------------------------------------------------------------
6ghz@disable@11be                 disabling 11be on 6ghz band
24ghz_disable_11be                disabling 11be on 2.4GHz band
all^bands^11be^disable            disabling 11be on all bands
5ghz!slot2!disable!11be           disabling 11be on slot 2
5ghz*slot1*disable*11be
default-dot11be-profile           Default 802.11be profile
1234567890abcdefghijklmnopqrstuv
```

Verify 802.11be profile parameters with MLO mapping

To verify 802.11be profile parameters with MLO mapping, run the **show wireless profile dot11be detailed***11be-prof-name* and **show wireless profile dot11be detailed***24ghz_disable_11be* commands.

```
Device# show wireless profile dot11be detailed 11be-prof-name
Device# show wireless profile dot11be detailed 24ghz_disable_11be


Dot11be profile name           : 24ghz_disable_11be
-------------------------------------------------
Description                    : disabling 11be on 2.4GHz band
802.11be parameters
    OFDMA Downlink             : Enabled
    OFDMA Uplink               : Enabled
    MU-MIMO Downlink           : Enabled
    MU-MIMO Uplink             : Enabled
    OFDMA Multi-RU             : Enabled
MLO Group
    24ghz link                 : Disabled
    5ghz link                  : Enabled
    5ghz secondary link        : Enabled
    6ghz link                  : Enabled
```

Verify 802.11be profile mapping to WLAN

To verify 802.11be profile mapping to WLAN, run the **show wireless profile dot11be detailed** *6ghz@disable@11be* command.

```
Device# show wireless profile dot11be detailed 6ghz@disable@11be
Dot11be profile name           : 6ghz@disable@11be
-------------------------------------------------
Description                    : disabling 11be on 6ghz band
802.11be parameters
    OFDMA Multi-RU             : Enabled
MLO Group
    24ghz link                 : Enabled
    5ghz link                  : Enabled
    5ghz secondary link        : Enabled
    6ghz link                  : Disabled
```

Verify VAP status for 802.11ax and 802.11be WLAN on 6 GHz band

To verify VAP status for 802.11ax and 802.11be WLAN on 6 GHz band, run the **show wireless tag policy detailed** *11ax-prof-name-policy-tag* **vap-id** command.

This table refers the MBBSID grouping for a 802.11ax AP (non 802.11be deployment).

```
Device #show wireless tag policy detailed 11ax-prof-name-policy-tag vap-id

WLAN-ID  WLAN profile name                Policy profile name              VAP-ID  status
    SET-ID  Beacon-Protection status  operational state
-------------------------------------------------------------------------------------------
1            open                          default-policy-profile           2       Enabled
   1*      Enabled (128bit cipher)   Enabled
4          wpa3sae                         policy-profile                   1       Enabled   1
       Enabled (128bit cipher)   Enabled
5          wpa3owe                         policy-profile                   3       Enabled   1
       Disabled                  Enabled
15         mbssid-1                        policy-profile                   4       Enabled   1
       Disabled                  Enabled
```

```
12       mbssid-8                          default-policy-profile            6       Enabled
   2*      Enabled (256bit cipher)   Enabled
10       mbssid-6                           policy-profile              5       Enabled   2
       Enabled (256bit cipher)   Enabled
7        mbssid-3                          default-policy-profile            7       Enabled
   2       Disabled                  Enabled
9        mbssid-5                           policy-profile              8       Enabled   2
       Disabled                  Enabled
13       mbssid-9                          default-policy-profile            9       Enabled
   3*      Disabled                  Enabled
14       mbssid-10                          policy-profile              12      Enabled   3
       Disabled                  Enabled
111      mbssid-a                           policy-profile              10      Enabled   3
       Disabled                  Enabled
112      mbssid-b                          default-policy-profile            11      Enabled
   3       Disabled                  Enabled
17       PSKWLAN                            policy-profile              13      Enabled   0
       N/A                       N/A
8        mbssid-4                          default-policy-profile            14      Enabled
   0       N/A                       N/A
6        mixed-mode                         policy-profile              15      Enabled   0
       N/A                       N/A

RLAN-ID  Remote-LAN profile name          Policy profile name               PORT-ID   VAP-ID
------------------------------------------------------------------------------------------
16385    rlan_profile               rlan*policy                1        16
```

Note * refers to Tx-VAP WLAN of MBSSID set and 0 refers to invalid MBSSID set-id. WLAN is not broadcast in the 6-GHz band.

Verify Policy Tag for 802.11be WLAN VAP Status on 6 GHz

To verify Policy Tag detail view to check the VAP status for 802.11be WLAN status on 6 GHz band, run the **show wireless tag policy detailed** *11be-prof-name-policy-tag* **vap-id** command.

This table refers to the MBBSID grouping for a 802.11be AP (802.11be deployment). The WLANs downgraded to 802.11ax do not adhere to the 802.11be security standards. The WLAN with no MBSSID slot is not shown in the 6 GHz but only in the 2.4 GHz & 5 GHz.

```
Device #show wireless tag policy detailed 11be-prof-name-policy-tag vap-id

    |-------------------------------------------------------------|

    |                      6GHz VAP information                   |

    |-------------------------------------------------------------|
                                                                                        WLAN
     MBBSID                                      operational
WLAN-ID  WLAN profile name                 Policy profile name                VAP-ID  status
    SET-ID  PHY mode  Beacon-Protection status     state
-------------------------------------------------------------------------------------------------
4        wpa3sae                           policy-profile              1       Enabled
1*      802.11ax  Enabled (128bit cipher)   Enabled (11ax downgraded)
5        wpa3owe                           policy-profile              2       Enabled   1
       802.11ax  Disabled                  Enabled (11ax downgraded)
15       mbssid-1                          policy-profile              3       Enabled   1
       802.11ax  Disabled                  Enabled (11ax downgraded)
9        mbssid-5                          policy-profile              4       Enabled   1
       802.11ax  Disabled                  Enabled (11ax downgraded)
```

```
13      mbssid-9                          default-policy-profile           5       Enabled
   2*      802.11ax  Disabled                  Enabled (11ax downgraded)
14      mbssid-10                          policy-profile              6       Enabled   2
       802.11ax  Disabled                  Enabled (11ax downgraded)
112     mbssid-b                          default-policy-profile           7       Enabled
   0       802.11be  Enabled (256bit cipher)   Disabled (no MBSSID slot)
17       PSKWLAN                           policy-profile              8       Enabled   0
       N/A       N/A                       N/A
1             open                         default-policy-profile           9       Enabled
   3*      802.11be  Enabled (128bit cipher)   Enabled
8       mbssid-4                          default-policy-profile           10      Enabled
   0       N/A       N/A                       N/A
6       mixed-mode                         policy-profile              11      Enabled   0
       N/A       N/A                       N/A
7       mbssid-3                          default-policy-profile           13      Enabled
   4*      802.11be  Enabled (256bit cipher)   Enabled
10      mbssid-6                           policy-profile              14      Enabled   4
       802.11be  Enabled (256bit cipher)   Enabled
12      mbssid-8                          default-policy-profile           15      Enabled
   4       802.11be  Enabled (256bit cipher)   Enabled
111     mbssid-a                           policy-profile              16      Enabled   4
       802.11be  Enabled (256bit cipher)   Enabled

RLAN-ID  Remote-LAN profile name          Policy profile name               PORT-ID   VAP-ID
-------------------------------------------------------------------------------------------
16385    rlan_profile               rlan*policy                1        12
```

Note * refers to Tx-VAP WLAN of MBSSID set and 0 refers to invalid MBSSID set-id. WLAN is not broadcast in the 6-GHz band. The first six WLANs are degraded to 802.11ax.

Verify WLAN downgrade from 802.11be to 802.11ax mode

To verify WLAN downgrade from 802.11be to 802.11ax mode, run the **show ap wlan summary** command.

This table describes the reason for downgrading the WLAN.

```
Device# show ap wlan summary

ecf4.0caf.23e1  wpa3owe                           wpa3owe                          Enabled
        00:20:52          0             row-AP-11be                      8.31.237.183
                         24ghz-EHT              Local            1485            23:31:01
          *2/7 (11 dBm)   (1)*                                      7 days 22 hours 55
minutes 49 seconds                23 hours 31 minutes 4 seconds
HE                               Cipher Not Met
ecf4.0caf.23e5  mbssid-10                         mbssid-10                        Enabled
        00:20:52          0             row-AP-11be                      8.31.237.183
                         24ghz-EHT              Local            1485            23:31:01
          *2/7 (11 dBm)   (1)*                                      7 days 22 hours 55
minutes 49 seconds                23 hours 31 minutes 4 seconds
HE                               AKM Not Met
ecf4.0caf.23e7  mdns-psk                          PSKWLAN                          Enabled
        00:19:56          0             row-AP-11be                      8.31.237.183
                         24ghz-EHT              Local            1485            23:31:01
          *2/7 (11 dBm)   (1)*                                      7 days 22 hours 55
minutes 49 seconds                23 hours 31 minutes 4 seconds
HE                               PMF Required
ecf4.0caf.23e9  mbssid-4                          mbssid-4                         Enabled
```

```
        00:20:52          0             row-AP-11be                    8.31.237.183
                         24ghz-EHT              Local           1485            23:31:01
          *2/7 (11 dBm)   (1)*                                    7 days 22 hours 55
minutes 49 seconds                23 hours 31 minutes 4 seconds
HE                               PMF Required
ecf4.0caf.23ea  mixed-mode-1                    mixed-mode                     Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         24ghz-EHT              Local           1485            23:31:01
          *2/7 (11 dBm)   (1)*                                    7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
HE                               AKM Not Met
ecf4.0caf.23ed  mbssid-6                        mbssid-6                       Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         24ghz-EHT              Local           1485            23:31:01
          *2/7 (11 dBm)   (1)*                                    7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
EHT                              NA
ecf4.0caf.23ee  mbssid-8                        mbssid-8                       Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         24ghz-EHT              Local           1485            23:31:01
          *2/7 (11 dBm)   (1)*                                    7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
EHT                              NA
ecf4.0caf.23ef  wpa3sae                         wpa3sae                        Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
HE                               AKM Not Met
ecf4.0caf.23ed  mbssid-1                        mbssid-1                       Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
HE                               Cipher Not Met
ecf4.0caf.23ec  mbssid-5                        mbssid-5                       Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
HE                               AKM Not Met
ecf4.0caf.23eb  mbssid-9                        mbssid-9                       Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
HE                               AKM Not Met
ecf4.0caf.23ea  mbssid-10                       mbssid-10                      Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
HE                               AKM Not Met
ecf4.0caf.23e9  mbssid-b                        mbssid-b                       Enabled
        00:20:52          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
EHT                              NA
ecf4.0caf.23e8  mdns-psk                        PSKWLAN                        Enabled
        00:19:56          0             row-AP-11be                    8.31.237.183
                         5ghz-EHT               Local           1485            23:31:01
          *2/8 (16 dBm)   (64)*                                   7 days 22 hours 55
minutes 50 seconds                23 hours 31 minutes 5 seconds
```

```
HE                                  PMF Required
ecf4.0caf.23e7       -open                          -open                          Enabled
     00:20:53          0             row-AP-11be                        8.31.237.183
                       5ghz-EHT              Local            1485             23:31:02
        *2/8 (16 dBm)   (64)*                                  7 days 22 hours 55 minutes
 50 seconds                23 hours 31 minutes 5 seconds                        EHT
                          NA
ecf4.0caf.23e6  mbssid-4                          mbssid-4                        Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          5ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (64)*                                    7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  PMF Required
ecf4.0caf.23e5  mixed-mode-1                      mixed-mode                      Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          5ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (64)*                                    7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  AKM Not Met
ecf4.0caf.23e3  mbssid-3                          mbssid-3                        Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          5ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (64)*                                    7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                                 NA
ecf4.0caf.23e2  mbssid-6                          mbssid-6                        Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          5ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (64)*                                    7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                                 NA
ecf4.0caf.23e7  wpa3sae                           wpa3sae                         Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          6ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                          7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  AKM Not Met
ecf4.0caf.23e6  wpa3owe                           wpa3owe                         Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          6ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                          7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  Cipher Not Met
ecf4.0caf.23e5  mbssid-1                          mbssid-1                        Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          6ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                          7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  Cipher Not Met
ecf4.0caf.23e4  mbssid-5                          mbssid-5                        Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          6ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                          7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  AKM Not Met
ecf4.0caf.23e3  mbssid-9                          mbssid-9                        Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          6ghz-EHT              Local            1485             23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                          7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                  AKM Not Met
ecf4.0caf.23e2  mbssid-10                         mbssid-10                       Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                          6ghz-EHT              Local            1485             23:31:02
```

```
          *2/8 (16 dBm)   (69,65,73,77)*                            7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
HE                                AKM Not Met
ecf4.0caf.23ef      -open                              -open                        Enabled
       00:20:53          0             row-AP-11be                        8.31.237.183
                         6ghz-EHT              Local            1485              23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                            7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                               NA
ecf4.0caf.23eb  mbssid-3                         mbssid-3                           Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                         6ghz-EHT              Local            1485              23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                            7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                               NA
ecf4.0caf.23ea  mbssid-6                         mbssid-6                           Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                         6ghz-EHT              Local            1485              23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                            7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                               NA
ecf4.0caf.23e9  mbssid-8                         mbssid-8                           Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                         6ghz-EHT              Local            1485              23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                            7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                               NA
ecf4.0caf.23e8  mbssid-a                         mbssid-a                           Enabled
        00:20:53          0             row-AP-11be                        8.31.237.183
                         6ghz-EHT              Local            1485              23:31:02
          *2/8 (16 dBm)   (69,65,73,77)*                            7 days 22 hours 55
minutes 50 seconds                 23 hours 31 minutes 5 seconds
EHT                               NA
```

Verify AP WLAN information on 6 GHz band with MBSSID slot

To verify AP WLAN information on 6 GHz band with MBSSID slot, run the **show ap name***row-AP-11be***wlan dot11 6ghz** command.

```
Device# show ap name row-AP-11be wlan dot11 6ghz

Slot id  : 2
  * Tx-VAP WLAN of MBSSID set
  WLAN ID    BSSID          MLD MAC                MBSSID SET ID
  --------------------------------------------------------------
  4          ecf4.0caf.23e7 Disabled                1*
  5          ecf4.0caf.23e6 Disabled                1
  15         ecf4.0caf.23e5 Disabled                1
  9          ecf4.0caf.23e4 Disabled                1
  13         ecf4.0caf.23e3 Disabled                2*
  14         ecf4.0caf.23e2 Disabled                2
  1          ecf4.0caf.23ef eef4.0caf.23f8          3*
  7          ecf4.0caf.23eb eef4.0caf.23fc          4*
  10         ecf4.0caf.23ea eef4.0caf.23fd          4
  12         ecf4.0caf.23e9 eef4.0caf.23fe          4
  111        ecf4.0caf.23e8 eef4.0caf.23ff          4
```