# Cisco Lightweight Access Point Commands

# ap auth-list ap-policy

To configure authorization policy for all Cisco lightweight access points joined to the switch, use the **ap auth-list ap-policy** command. To disable authorization policy for all Cisco lightweight access points joined to the switch, use the **no** form of this command.

**ap auth-list ap-policy** {**authorize-ap|lsc|mic|ssc**}
**no ap auth-list ap-policy** {**authorize-ap|lsc|mic|ssc**}

| Syntax Description | | |
|---|---|---|
| **authorize-ap** | Enables the authorization policy. | |
| **lsc** | Enables access points with locally significant certificates to connect. | |
| **mic** | Enables access points with manufacture-installed certificates to connect. | |
| **ssc** | Enables access points with self signed certificates to connect. | |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the access point authorization policy:

```
Switch(config)# ap auth-list ap-policy authorize-ap
```

This example shows how to enable access points with locally significant certificates to connect:

```
Switch(config)# ap auth-list ap-policy lsc
```

This example shows how to enable access points with manufacture-installed certificates to connect:

```
Switch(config)# ap auth-list ap-policy mic
```

This example shows how to enable access points with self-signed certificates to connect:

```
Switch(config)# ap auth-list ap-policy ssc
```

# ap bridging

To enable Ethernet to 802.11 bridging on a Cisco lightweight access point, use the **ap bridging** command. To disable Ethernet to 802.11 bridging on a Cisco lightweight access point, use the **no** form of this command.

**ap bridging**
**no ap bridging**

| | |
|---|---|
| **Syntax Description** | This command has no keywords and arguments. |
| **Command Default** | None |
| **Command Modes** | Global configuration |

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable Ethernet-to-Ethernet bridging on a lightweight access point:

```
Switch(config)# ap bridging
```

This example shows how to disable Ethernet-to-Ethernet bridging on a lightweight access point:

```
Switch(config)# no ap bridging
```

# ap capwap multicast

To configure the multicast address used by all access points to receive multicast traffic when multicast forwarding is enabled and to configure the outer Quality of Service (QoS) level of those multicast packets sent to the access points, use the **ap capwap multicast** command.

**ap capwap multicast** {*multicast-ip-address*|**service-policy output** *pollicymap-name*}

**Syntax Description**

| | |
|---|---|
| *multicast-ip-address* | Multicast IP address. |
| **service-policy** | Specifies the tunnel QoS policy for multicast access points. |
| **output** | Assigns a policy map name to the output. |
| *policymap-name* | Service policy map name. |

**Command Default**   None

**Command Modes**   Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure a multicast address used by all access points to receive multicast traffic when multicast forwarding is enabled:

```
Switch(config)# ap capwap multicast 239.2.2.2
```

This example shows how to configure a tunnel multicast QoS service policy for multicast access points:

```
Switch(config)# ap capwap multicast service-policy output tunnmulpolicy
```

**Related Topics**

ap capwap retransmit, on page 9
ap capwap timers, on page 10

# ap capwap retransmit

To configure Control and Provisioning of Wireless Access Points (CAPWAP) control packet retransmit count and control packet retransmit interval, use the **ap capwap retransmit** command.

**ap capwap retransmit** {**count** *retransmit-count*|**interval** *retransmit-interval*}

| Syntax Description | | |
|---|---|---|
| **count** *retransmit-count* | Specifies the access point CAPWAP control packet retransmit count. | |
| | **Note** | The count is from 3 to 8 seconds. |
| **interval** *retransmit-interval* | Specifies the access point CAPWAP control packet retransmit interval. | |
| | **Note** | The interval is from 2 to 5 seconds. |

**Command Default**  None

**Command Modes**  Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the CAPWAP control packet retransmit count for an access point:

```
Switch# ap capwap retransmit count 3
```

This example shows how to configure the CAPWAP control packet retransmit interval for an access point:

```
Switch# ap capwap retransmit interval 5
```

# ap capwap timers

To configure advanced timer settings, use the **ap capwap timers** command.

**ap capwap timers** {**discovery-timeout** *seconds*|**fast-heartbeat-timeout local** *seconds*|**heartbeat-timeout** *seconds*|**primary-discovery-timeout** *seconds*|**primed-join-timeout** *seconds*}

| Syntax Description | | |
|---|---|---|
| **discovery-timeout** | Specifies the Cisco lightweight access point discovery timeout. | |
| | **Note** | The Cisco lightweight access point discovery timeout is how long a Cisco switch waits for an unresponsive access point to answer before considering that the access point failed to respond. |
| *seconds* | Cisco lightweight access point discovery timeout from 1 to 10 seconds. | |
| | **Note** | The default is 10 seconds. |
| **fast-heartbeat-timeout local** | Enables the fast heartbeat timer that reduces the amount of time it takes to detect a switch failure for local or all access points. | |
| *seconds* | Small heartbeat interval (from 1 to 10 seconds) that reduces the amount of time it takes to detect a switch failure. | |
| | **Note** | The fast heartbeat time-out interval is disabled by default. |
| **heartbeat-timeout** | Specifies the Cisco lightweight access point heartbeat timeout. | |
| | **Note** | The Cisco lightweight access point heartbeat timeout controls how often the Cisco lightweight access point sends a heartbeat keep-alive signal to the Cisco switch. |
| | | This value should be at least three times larger than the fast heartbeat timer. |
| *seconds* | Cisco lightweight access point heartbeat timeout value from 1 to 30 seconds. | |
| | **Note** | The default is 30 seconds. |
| **primary-discovery-timeout** | Specifies the access point primary discovery request timer. The timer determines the amount of time taken by an access point to discovery the configured primary, secondary, or tertiary switch. | |
| *seconds* | Access point primary discovery request timer from 30 to 3600 seconds. | |
| | **Note** | The default is 120 seconds. |
| **primed-join-timeout** | Specifies the authentication timeout. Determines the time taken by an access point to determine that the primary switch has become unresponsive. The access point makes no further attempts to join the switch until the connection to the switch is restored. | |

| | |
|---|---|
| *seconds* | Authentication response timeout from 120 to 43200 seconds. |
| | **Note** The default is 120 seconds. |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure an access point discovery timeout with the timeout value of 7:

```
Switch(config)# ap capwap timers discovery-timeout 7
```

This example shows how to enable the fast heartbeat interval for all access points:

```
Switch(config)# ap capwap timers fast-heartbeat-timeout 6
```

This example shows how to configure an access point heartbeat timeout to 20:

```
Switch(config)# ap capwap timers heartbeat-timeout 20
```

This example shows how to configure the access point primary discovery request timer to 1200 seconds:

```
Switch(config)# ap capwap timers primary-discovery-timeout 1200
```

This example shows how to configure the authentication timeout to 360 seconds:

```
Switch(config)# ap capwap timers primed-join-timeout 360
```

**Related Topics**

ap capwap multicast, on page 8
ap capwap retransmit, on page 9

# ap cdp

To enable the Cisco Discovery Protocol (CDP) on a Cisco lightweight access point, use the **ap cdp** command. To disable the Cisco Discovery Protocol (CDP) on a Cisco lightweight access point, use the **no** form of this command.

ap cdp [interface {ethernet *ethernet-id*|radio *radio-id*}]
**no ap cdp** [**interface** {**ethernet** *ethernet-id*|**radio** *radio-id*}]

**Syntax Description**

| | |
|---|---|
| **interface** | (Optional) Specifies CDP in a specific interface. |
| **ethernet** | Specifies CDP for an Ethernet interface. |
| *ethernet-id* | Ethernet interface number from 0 to 3. |
| **radio** | Specifies CDP for a radio interface. |
| *radio-id* | Radio number from 0 to 3. |

**Command Default**    Disabled on all access points.

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    The **no ap cdp** command disables CDP on all access points that are joined to the switch and all access points that join in the future. CDP remains disabled on both current and future access points even after the switch or access point reboots. To enable CDP, enter the **ap cdp** command.

**Note**    CDP over Ethernet/radio interfaces is available only when CDP is enabled. After you enable CDP on all access points joined to the switch, you can disable and then reenable CDP on individual access points using the **ap name** *Cisco-AP* **cdp** command. After you disable CDP on all access points joined to the switch, you can enable and then disable CDP on individual access points.

This example shows how to enable CDP on all access points:

```
Switch(config)# ap cdp
```

This example shows how to enable CDP for Ethernet interface number 0 on all access points:

```
Switch(config)# ap cdp ethernet 0
```

**Related Topics**

show ap cdp, on page 161

# ap core-dump

To enable a Cisco lightweight access point's memory core dump settings, use the **ap core-dump** command. To disable a Cisco lightweight access point's memory core dump settings, use the **no** form of this command.

**ap core-dump** *tftp-ip-addr* *filename* {**compress|uncompress**}
**no ap core-dump**

| Syntax Description | *tftp-ip-addr* | IP address of the TFTP server to which the access point sends core dump files. |
| --- | --- | --- |
| | *filename* | Name that the access point uses to label the core file. |
| | **compress** | Compresses the core dump file. |
| | **uncompress** | Uncompresses the core dump file. |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  The access point must be able to reach the TFTP server.

This example shows how to configure and compress the core dump file:

```
Switch(config)# ap core-dump 192.0.2.51 log compress
```

**Related Topics**

# ap country

To configure one or more country codes for a switch, use the **ap country** command.

**ap country** *country-code*

| | |
|---|---|
| **Syntax Description** | *country-code* Two-letter or three-letter country code or several country codes separated by a comma. |

**Command Default** US (country code of the United States of America).

**Command Modes** Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** The Cisco switch must be installed by a network administrator or qualified IT professional and the installer must select the proper country code. Following installation, access to the unit should be password protected by the installer to maintain compliance with regulatory requirements and to ensure proper unit functionality. See the related product guide for the most recent country codes and regulatory domains.

This example shows how to configure country codes on the switch to IN (India) and FR (France):

```
Switch(config)# ap country IN,FR
```

**Related Topics**

# ap crash-file

To delete crash and radio core dump files, use the **ap crash-file** command.

**ap crash-file** {**clear-all|delete** *filename*}

| Syntax Description | | |
|---|---|---|
| **clear-all** | Deletes all the crash and radio core dump files. | |
| **delete** | Deletes a single crash and radio core dump file. | |
| *filename* | Name of the file to delete. | |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to delete all crash files:

```
Switch# ap crash-file clear-all
```

This example shows how to delete crash file 1:

```
Switch# ap crash-file delete crash-file-1
```

**Related Topics**

# ap dot11 24ghz preamble

To enable only a short preamble as defined in subclause 17.2.2.2 , use the **ap dot11 24ghz preamble** command. To enable long preambles (for backward compatibility with pre-802.11b devices, if these devices are still present in your network) or short preambles (recommended unless legacy pre-802.11b devices are present in the network), use the **no** form of this command.

**ap dot11 24ghz preamble short**
**no ap dot11 24ghz preamble short**

**Syntax Description**

| | |
|---|---|
| **short** | Specifies the short 802.11b preamble. |

**Command Default**     short preambles

**Command Modes**     Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

**Note**     You must reboot the Cisco switch (reset system) with the **Save** command before you can use the **ap dot11 24ghz preamble** command.

This parameter may need to be set to long to optimize this Cisco switch for some legacy clients, including SpectraLink NetLink telephones.

This command can be used any time that the CLI interface is active.

This example shows how to enable both long and short preamblest:

```
Switch(config)# no ap dot11 24ghz preamble short
```

# ap dot11 24ghz dot11g

To enable the Cisco wireless LAN solution 802.11g network, use the **ap dot11 24ghz dot11g** command. To disable the Cisco wireless LAN solution 802.11g network, use the **no** form of this command.

**ap dot11 24ghz dot11g**
**no ap dot11 24ghz dot11g**

| | |
|---|---|
| **Syntax Description** | This command has no keywords and arguments. |

**Command Default**  Enabled

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  Before you enter the **ap dot11 24ghz dot11g** command, disable the 802.11 Cisco radio with the **ap dot11 24ghz shutdown** command.

After you configure the support for the 802.11g network, use the **no ap dot11 24ghz shutdown** command to enable the 802.11 2.4 Ghz radio.

This example shows how to enable the 802.11g network:

```
Switch(config)# ap dot11 24ghz dot11g
```

**Related Topics**

# ap dot11 5ghz channelswitch mode

To configure a 802.11h channel switch announcement, use the **ap dot11 5ghz channelswitch mode** command. To disable a 802.11h channel switch announcement, use the **no** form of this command.

**ap dot11 5ghz channelswitch mode** *value*
**no ap dot11 5ghz channelswitch mode**

| | | |
|---|---|---|
| **Syntax Description** | *value* | 802.11h channel announcement value. |
| | **Note** | You can specify anyone of the following two values:<br><br>• 0—Indicates that the channel switch announcement is disabled.<br><br>• 1—Indicates that the channel switch announcement is enabled. |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the 802.11h switch announcement:

```
Switch(config)# ap dot11 5ghz channelswitch mode 1
```

# ap dot11 5ghz power-constraint

To configure the 802.11h power constraint value, use the **ap dot11 5ghz power-constraint** command. To remove the 802.11h power constraint value, use the **no** form of this command.

**ap dot11 5ghz power-constraint** *value*
**no ap dot11 5ghz power-constraint**

**Syntax Description**

| | |
|---|---|
| *value* | 802.11h power constraint value. |
| | **Note** The range is from 0 to 30 dBm. |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the 802.11h power constraint to 5 dBm:

```
Switch(config)# ap dot11 5ghz power-constraint 5
```

# ap dot11 beaconperiod

To change the beacon period globally for 2.4 GHz or 5 GHz bands, use the **ap dot11 beaconperiod** command.

**Note** Disable the 802.11 network before using this command. See the "Usage Guidelines" section.

**ap dot11** {**24ghz|5ghz**} **beaconperiod** *time*

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the settings for 2.4 GHz band. |
| **5ghz** | Specifies the settings for 5 GHz band. |
| **beaconperiod** | Specifies the beacon for a network globally. |
| *time* | Beacon interval in time units (TU). One TU is 1024 microseconds. The range is from 20 to 1000. |

**Command Default** None

**Command Modes** Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** In Cisco wireless LAN 802.11 networks, all Cisco lightweight access point wireless LANs broadcast a beacon at regular intervals. This beacon notifies clients that the wireless service is available and allows the clients to synchronize with the lightweight access point.

Before you change the beacon period, make sure that you have disabled the 802.11 network by using the **ap dot11** {**24ghz | 5ghz**} **shutdown** command. After changing the beacon period, enable the 802.11 network by using the **no ap dot11** {**24ghz | 5ghz**} **shutdown** command.

This example shows how to configure the 5 GHZ band for a beacon period of 120 time units:

```
Switch(config)# ap dot11 5ghz beaconperiod 120
```

# ap dot11 beamforming

To enable beamforming on the network or on individual radios, use the **ap dot11 beamforming** command.

**ap dot11 {24ghz|5ghz} beamforming**

| Syntax Description | | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **beamforming** | Specifies beamforming on the network. |

**Command Default**  None

**Command Modes**  Global configuration

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  When you enable beamforming on the network, it is automatically enabled for all the radios applicable to that network type.

Follow these guidelines for using beamforming:

- Beamforming is supported for legacy orthogonal frequency-division multiplexing (OFDM) data rates (6, 9, 12, 18, 24, 36, 48, and 54 Mbps).

> **Note**  Beamforming is not supported for Direct Sequence Spread Spectrum data rates ( 1 and 2 Mbps) and Complementary-Code Key (CCK) data rates (5.5 and 11 Mbps).

- Beamforming is supported only on access points that support 802.11n (AP1260, AP3500, and AP3600).

- Two or more antennas must be enabled for transmission.

- All three antennas must be enabled for reception.

- OFDM rates must be enabled.

  If the antenna configuration restricts operation to a single transmit antenna, or if OFDM rates are disabled, beamforming is not used.

This example shows how to enable beamforming on the 5 GHz band:

```
Switch(config)# ap dot11 5ghz beamforming
```

# ap dot11 cac media-stream

To configure media stream Call Admission Control (CAC) voice and video quality parameters for 2.4 GHz and 5 GHz bands, use the **ap dot11 cac media-stream** command.

**ap dot11** {**24ghz|5ghz**} **cac media-stream multicast-direct** {**max-retry-percent**
*retryPercent*|**min-client-rate** *dot11Rate*}

| Syntax Description | | |
| --- | --- |
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **multicast-direct** | Specifies CAC parameters for multicast-direct media streams. |
| **max-retry-percent** | Specifies the percentage of maximum retries that are allowed for multicast-direct media streams. |
| *retryPercent* | Percentage of maximum retries that are allowed for multicast-direct media streams.<br><br>**Note**   The range is from 0 to 100. |
| **min-client-rate** | Specifies the minimum transmission data rate to the client for multicast-direct media streams (rate at which the client must transmit in order to receive multicast-direct unicast streams).<br><br>If the transmission rate is below this rate, either the video will not start or the client may be classified as a bad client. The bad client video can be demoted for better effort QoS or subject to denial. |

| | |
|---|---|
| *min-client-rate* | You can choose the following rates:<br><br>• **eighteen**<br><br>• **eleven**<br><br>• **fiftyFour**<br><br>• **fivePointFive**<br><br>• **fortyEight**<br><br>• **nine**<br><br>• **one**<br><br>• **oneFifty**<br><br>• **oneFortyFourPointFour**<br><br>• **oneThirty**<br><br>• **oneThirtyFive**<br><br>• **seventyTwoPointTwo**<br><br>• **six**<br><br>• **sixtyFive**<br><br>• **thirtySix**<br><br>• **threeHundred**<br><br>• **twelve**<br><br>• **twentyFour**<br><br>• **two**<br><br>• **twoSeventy** |

**Command Default**

The default value for the maximum retry percent is 80. If it exceeds 80, either the video will not start or the client might be classified as a bad client. The bad client video will be demoted for better effort QoS or is subject to denial.

**Command Modes**

Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

• Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

- Disable the radio network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **shutdown** command.

- Save the new configuration.

- Enable voice or video CAC for the network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **cac voice acm** or **ap dot11** {**24ghz** | **5ghz**} **cac video acm** commands.

This example shows how to configure the maximum retry percent for multicast-direct media streams as 90 on a 802.11a network:

```
Switch(config)# ap dot11 5ghz cac media-stream multicast max-retry-percent 90
```

**Related Topics**

# ap dot11 cac multimedia

To configure multimedia Call Admission Control (CAC) voice and video quality parameters for 2.4 GHz and 5 GHz bands, use the **ap dot11 cac multimedia** command.

**ap dot11 {24ghz|5ghz} cac multimedia max-bandwidth** *bandwidth*

| Syntax Description | | |
|---|---|---|
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |
| | **max-bandwidth** | Specifies the percentage of maximum bandwidth allocated to Wi-Fi Multimedia (WMM) clients for voice and video applications on the 2.4 GHz or 5 GHz band. |
| | *bandwidth* | Percentage of the maximum bandwidth allocated to WMM clients for voice and video applications on the 802.11a or 802.11b/g network. Once the client reaches the specified value, the access point rejects new multimedia flows this radio band. The range is from 5 to 85%. |

**Command Default**  The default value is 75%.

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

- Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

- Disable the radio network you want to configure by entering the **ap dot11 {24ghz | 5ghz} shutdown** command.

- Save the new configuration.

- Enable voice or video CAC for the network you want to configure by entering the **ap dot11 {24ghz | 5ghz} cac voice acm** or **ap dot11 {24ghz | 5ghz} cac video acm** commands.

This example shows how to configure the percentage of the maximum bandwidth allocated to WMM clients for voice and video applications on the 5 GHz band:

```
Switch(config)# ap dot11 5ghz cac multimedia max-bandwidth 5
```

**Related Topics**

# ap dot11 cac video

To configure Call Admission Control (CAC) parameters for the video category, use the **ap dot11 cac video** command. To disable the CAC parameters for video category, use the **no** form of this command.

**ap dot11** {**24ghz|5ghz**} **cac video** {**acm|max-bandwidth** *value*|**roam-bandwidth** *value*}
**no ap dot11** {**24ghz|5ghz**} **cac video** {**acm|max-bandwidth** *value*|**roam-bandwidth** *value*}

| Syntax Description | | |
|---|---|---|
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| **acm** | Enables bandwidth-based video CAC for the 2.4 GHz or 5 GHz band. | |
| | **Note** | To disable bandwidth-based video CAC for the 2.4 GHz or 5 GHz band, use the **no ap dot11** {**24ghz | 5ghz**} **cac video acm** command. |
| **max-bandwidth** | Sets the percentage of the maximum bandwidth allocated to clients for video applications on the 2.4 GHz or 5 GHz band. | |
| *value* | Bandwidth percentage value from 5 to 85%. | |
| **roam-bandwidth** | Sets the percentage of the CAC maximum allocated bandwidth reserved for roaming video clients on the 2.4 GHz or 5 GHz band. | |
| *value* | Bandwidth percentage value from 0 to 85%. | |

**Command Default**  None

**Command Modes**  Global configuration

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

- Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

- Disable the radio network you want to configure by entering the **ap dot11** {**24ghz | 5ghz**} **shutdown** command.

- Save the new configuration.

- Enable voice or video CAC for the network you want to configure by entering the **ap dot11** {**24ghz | 5ghz**} **cac voice acm** or **ap dot11** {**24ghz | 5ghz**} **cac video acm** command.

This example shows how to enable the bandwidth-based CAC:

```
Switch(config)# ap dot11 24ghz cac video acm
```

This example shows how to specify the percentage of the maximum allocated bandwidth for video applications on the selected radio band:

```
Switch(config)# ap dot11 24ghz cac video max-bandwidth 50
```

This example shows how to configure the percentage of the maximum allocated bandwidth reserved for roaming video clients on the selected radio band:

```
Switch(config)# ap dot11 24ghz cac video roam-bandwidth 10
```

**Related Topics**

# ap dot11 cac voice

To configure Call Admission Control (CAC) parameters for the voice category, use the **ap dot11 cac voice** command.

**ap dot11** {**24ghz**|**5ghz**} **cac voice**{**acm**|**load-based**|**max-bandwidth** *value*|**roam-bandwidth** *value*|**sip** [**bandwidth** *bw*] **sample-interval** *value*|**stream-size** *x* **max-streams** *y*|**tspec-inactivity-timeout**{**enable**|**ignore**}}

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **acm** | Enables bandwidth-based voice CAC for the 2.4 GHz or 5 GHz band. <br><br> **Note** To disable bandwidth-based voice CAC for the 2.4 GHz or 5 GHz band, use the **no ap dot11** {**24ghz** \| **5ghz**} **cac voice acm** command. |
| **load-based** | Enable load-based CAC on voice access category. <br><br> **Note** To disable load-based CAC on voice access category for the 2.4 GHz or 5 GHz band, use the **no ap dot11** {**24ghz** \| **5ghz**} **cac voice load-based** command. |
| **max-bandwidth** | Sets the percentage of the maximum bandwidth allocated to clients for voice applications on the 2.4 GHz or 5 GHz band. |
| *value* | Bandwidth percentage value from 5 to 85%. |
| **roam-bandwidth** | Sets the percentage of the CAC maximum allocated bandwidth reserved for roaming voice clients on the 2.4 GHz or 5 GHz band. |
| *value* | Bandwidth percentage value from 0 to 85%. |
| **sip** | Specifies the CAC codec name and sample interval as parameters and calculates the required bandwidth per call for the 802.11 networks. |
| **bandwidth** | (Optional) Specifies bandwidth for a SIP-based call. |

| | |
|---|---|
| *bw* | Bandwidth in kbps. The following bandwidth values specify parameters for the SIP codecs: |
| | • 64kbps—Specifies CAC parameters for the SIP G711 codec. |
| | • 8kbps—Specifies CAC parameters for the SIP G729 codec. |
| | **Note** The default value is 64 Kbps. |
| **sample-interval** | Specifies the packetization interval for SIP codec. |
| *value* | Packetization interval in msecs. The sample interval for SIP codec value is 20 seconds. |
| **stream-size** | Specifies the number of aggregated voice Wi-Fi Multimedia (WMM) traffic specification (TSPEC) streams at a specified data rate for the 2.4 GHz or 5 GHz band. |
| *x* | Stream size. The range of the stream size is from 84000 to 92100. |
| **max-streams** | Specifies the maximum number of streams per TSPEC. |
| *y* | Number (1 to 5) of voice streams. |
| | **Note** The default number of streams is 2 and the mean data rate of a stream is 84 kbps. |
| **tspec-inactivity-timeout** | Specifies TSPEC inactivity timeout processing mode. |
| | **Note** Use this keyword to process or ignore the Wi-Fi Multimedia (WMM) traffic specifications (TSPEC) inactivity timeout received from an access point. When the inactivity timeout is ignored, a client TSPEC is not deleted even if the access point reports an inactivity timeout for that client. |
| **enable** | Processes the TSPEC inactivity timeout messages. |
| **ignore** | Ignores the TSPEC inactivity timeout messages. |
| | **Note** The default is **ignore** (disabled). |

**Command Default**    None

**Command Modes**    Global configuration

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  CAC commands require that the WLAN you are planning to modify is configured for the Wi-Fi Multimedia (WMM) protocol and the quality of service (QoS) level be set to Platinum.

Before you can configure CAC parameters on a network, you must complete the following prerequisites:

- Disable all WLANs with WMM enabled by entering the **wlan** *wlan_name* **shutdown** command.

- Disable the radio network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **shutdown** command.

- Save the new configuration.

- Enable voice or video CAC for the network you want to configure by entering the **ap dot11** {**24ghz** | **5ghz**} **cac voice acm** or **ap dot11** {**24ghz** | **5ghz**} **cac video acm** commands.

This example shows how to enable the bandwidth-based CAC:

```
Switch(config)# ap dot11 24ghz cac voice acm
```

This example shows how to enable the load-based CAC on the voice access category:

```
Switch(config)# ap dot11 24ghz cac voice load-based
```

This example shows how to specify the percentage of the maximum allocated bandwidth for voice applications on the selected radio band:

```
Switch(config)# ap dot11 24ghz cac voice max-bandwidth 50
```

This example shows how to configure the percentage of the maximum allocated bandwidth reserved for roaming voice clients on the selected radio band:

```
Switch(config)# ap dot11 24ghz cac voice roam-bandwidth 10
```

This example shows how to configure the bandwidth and voice packetization interval for the G729 SIP codec on a 2.4 GHz band:

```
Switch(config)# ap dot11 24ghz cac voice sip bandwidth 8 sample-interval 40
```

This example shows how to configure the number of aggregated voice traffic specifications stream with a stream size of 85000 and with a maximum of 5 streams:

```
Switch(config)# ap dot11 24ghz cac voice stream-size 85000 max-streams 5
```

This example shows how to enable the voice TSPEC inactivity timeout messages received from an access point:

```
Switch(config)# ap dot11 24ghz cac voice tspec-inactivity-timeout enable
```

**Related Topics**

ap dot11 cac media-stream, on page 22

# ap dot11 cleanair

To configure CleanAir on 802.11 networks, use the **ap dot11 cleanair** command. To disable CleanAir on 802.11 networks, use the **no** form of this command.

**ap dot11** {**24ghz**|**5ghz**} **cleanair**
**no ap dot11** {**24ghz**|**5ghz**} **cleanair**

| Syntax Description | | |
|---|---|---|
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| **cleanair** | Specifies CleanAir on the 2.4 GHz or 5 GHz band. | |

**Command Default**    Disabled

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the CleanAir settings on the 2.4 GHz band:

```
Switch(config)# ap dot11 24ghz cleanair
```

**Related Topics**

# ap dot11 cleanair alarm air-quality

To configure CleanAir air-quality alarms for Cisco lightweight access points, use the **ap dot11 cleanair alarm air-quality** command.

**ap dot11** {**24ghz|5ghz**} **cleanair alarm air-quality** [**threshold** *value*]

| Syntax Description | | |
|---|---|---|
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| **threshold** | Specifies the air-quality alarm threshold. | |
| *value* | Air quality alarm threshold (1 is bad air quality, and 100 is good air quality). | |

**Command Default**    Disabled

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the CleanAir 2.4 GHz air-quality threshold to 90:

```
Switch(config)# ap dot11 24ghz cleanair air-quality threshold 90
```

**Related Topics**

# ap dot11 cleanair alarm device

To configure the CleanAir interference devices alarms on the 2.4 GHz or 5 GHz bands, use the **ap dot11 cleanair alarm device** command. To disable the CleanAir interference devices alarms on the 802.11 networks, use the **no** form of this command.

**ap dot11** {**24ghz**|**5ghz**} **cleanair alarm device**{**all**|**bt-discovery**|**bt-link**|**canopy**|**cont-tx**|**dect-like**|**fh**|**inv**|**jammer**|**mw-oven**|**nonstd**|**superag**|**tdd-tx**|**video**|**wimax-fixed**|**wimax-mobile**|**xbox**|**zigbee**}
**no ap dot11** {**24ghz**|**5ghz**} **cleanair**

| Syntax Description | | |
| --- | --- | --- |
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |
| | **all** | Specifies all the device types at once. |
| | **bt-discovery** | Specifies the Bluetooth device in discovery mode. |
| | **bt-link** | Specifies the Bluetooth active link. |
| | **canopy** | Specifies the Canopy devices. |
| | **cont-tx** | Specifies the continuous transmitter. |
| | **dect-like** | Specifies a Digital Enhanced Cordless Communication (DECT)-like phone. |
| | **fh** | Specifies the frequency hopping devices. |
| | **inv** | Specifies the devices using spectrally inverted Wi-Fi signals. |
| | **jammer** | Specifies the jammer. |
| | **mw-oven** | Specifies the microwave oven devices. |
| | **nonstd** | Specifies the devices using nonstandard Wi-Fi channels. |
| | **superag** | Specifies 802.11 SuperAG devices. |
| | **tdd-tx** | Specifies the TDD transmitter. |
| | **video** | Specifies video cameras. |
| | **wimax-fixed** | Specifies a WiMax fixed device. |
| | **wimax-mobile** | Specifies a WiMax mobile device. |
| | **xbox** | Specifies the Xbox device. |
| | **zigbee** | Specifies the ZigBee device. |

**Command Default**    Disabled

**Command Modes**    Global configuration

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to disable alarms for ZigBee interference detection:

```
Switch(config)# no ap dot11 24ghz cleanair alarm device zigbee
```

This example shows how to enable alarms for detection of Bluetooth links:

```
Switch(config)# ap dot11 24ghz cleanair alarm device bt-link
```

**Related Topics**

ap dot11 cleanair alarm air-quality, on page 34

ap dot11 cleanair, on page 33

ap dot11 cleanair device, on page 37

# ap dot11 cleanair device

To configure CleanAir interference device types, use the **ap dot11 cleanair device** command.

**ap dot11 24ghz cleanair device**
[{all|bt-discovery|bt-link|canopy|cont-tx|dect-like|fh|inv|jammer|mw-oven|nonstd|superag|tdd-tx|video|wimax-fixed|wimax-mobile|xbox|zigbee}]

**Syntax Description**

| | |
|---|---|
| **all** | Specifies all device types. |
| **device** | Specifies the CleanAir interference device type. |
| **bt-discovery** | Specifies the Bluetooth device in discovery mode. |
| **bt-link** | Specifies the Bluetooth active link. |
| **canopy** | Specifies the Canopy devices. |
| **cont-tx** | Specifies the continuous transmitter. |
| **dect-like** | Specifies a Digital Enhanced Cordless Communication (DECT)-like phone. |
| **fh** | Specifies the 802.11 frequency hopping devices. |
| **inv** | Specifies the devices using spectrally inverted Wi-Fi signals. |
| **jammer** | Specifies the jammer. |
| **mw-oven** | Specifies the microwave oven devices. |
| **nonstd** | Specifies the devices using nonstandard Wi-Fi channels. |
| **superag** | Specifies 802.11 SuperAG devices. |
| **tdd-tx** | Specifies the TDD transmitter. |
| **video** | Specifies video cameras. |
| **wimax-fixed** | Specifies a WiMax fixed device. |
| **wimax-mobile** | Specifies a WiMax mobile device. |
| **xbox** | Specifies the Xbox device. |
| **zigbee** | Specifies the ZigBee device. |

**Command Default**   None

**Command Modes**   Global configuration

| Command History | Release | Modification |
| --- | --- | --- |
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the switch to monitor ZigBee interferences:

```
Switch(config)# ap dot11 24ghz cleanair device zigbee
```

**Related Topics**

# ap dot11 dot11n

To configure settings for an 802.11n network, use the **ap dot11 dot11n** command.

**ap dot11** {**24ghz**|**5ghz**} **dot11n** {**a-mpdu tx priority** {*priority_value* **all** } | **scheduler timeout rt** *scheduler_value*}|**a-msdu tx priority** {*priority_value*|**all**}|**guard-interval** {**any**|**long**}|**mcs tx** *rate*|**rifs rx**}

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the 2.4-GHz band. |
| **5ghz** | Specifies the 5-GHz band. |
| **dot11n** | Enables 802.11n support. |
| **a-mpdu tx priority** | Specifies the traffic that is associated with the priority level that uses Aggregated MAC Protocol Data Unit (A-MPDU) transmission. |
| *priority_value* | Aggregated MAC protocol data unit priority level from 0 to 7. |
| **all** | Specifies all of the priority levels at once. |
| **a-msdu tx priority** | Specifies the traffic that is associated with the priority level that uses Aggregated MAC Service Data Unit (A-MSDU) transmission. |
| *priority_value* | Aggregated MAC protocol data unit priority level from 0 to 7. |
| **all** | Specifies all of the priority levels at once. |
| **scheduler timeout rt** | Configures the 802.11n A-MPDU transmit aggregation scheduler timeout value in milliseconds. |
| *scheduler_value* | The 802.11n A-MPDU transmit aggregation scheduler timeout value from 1 to 10000 milliseconds. |
| **guard-interval** | Specifies the guard interval. |
| **any** | Enables either a short or a long guard interval. |
| **long** | Enables only a long guard interval. |
| **mcs tx** *rate* | Specifies the modulation and coding scheme (MCS) rates at which data can be transmitted between the access point and the client. |
| *rate* | Specifies the modulation and coding scheme data rates. <br><br> **Note**      The range is from 0 to 23. |

| | |
|---|---|
| **rifs rx** | Specifies the Reduced Interframe Space (RIFS) between data frames. |

**Command Default**    By default, priority 0 is enabled.

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |
| Cisco IOS XE 3.3SE | The scheduler, timeout, and rt keywords were added. |

**Usage Guidelines**    Aggregation is the process of grouping packet data frames together rather than transmitting them separately. The two aggregation methods available are:

- A-MPDU—This aggregation is performed in the software.
- A-MSDU—This aggregation is performed in the hardware

Aggregated MAC Protocol Data Unit priority levels assigned per traffic type are as follows:

- 0—Best effort

- 1—Background

- 2—Spare

- 3—Excellent effort

- 4—Controlled load

- 5—Video, less than 100-ms latency and jitter

- 6—Voice, less than 10-ms latency and jitter

- 7—Network control

- all—Configure all of the priority levels at once.

**Note**    Configure the priority levels to match the aggregation method used by the clients.

This example shows how to enable 802.11n support on a 2.4-GHz band:

```
Switch(config)# ap dot11 24ghz dot11n
```

This example shows how to configure all the priority levels at once so that the traffic that is associated with the priority level uses A-MSDU transmission:

```
Switch(config)# ap dot11 24ghz dot11n a-msdu tx priority all
```

This example shows how to enable only long guard intervals:

```
Switch(config)# ap dot11 24ghz dot11n guard-interval long
```

This example shows how to specify MCS rates:

```
Switch(config)# ap dot11 24ghz dot11n mcs tx 5
```

This example shows how to enable RIFS:

```
Switch(config)# ap dot11 24ghz dot11n rifs rx
```

## Related Topics

# ap dot11 dtpc

To configure Dynamic Transmit Power Control (DTPC) settings, Cisco Client eXtension (CCX) version 5 expedited bandwidth request feature, and the fragmentation threshold on an 802.11 network, use the **ap dot11 dtpc** command.

**ap dot11** {**24ghz|5ghz**} {**dtpc|exp-bwreq|fragmentation** *threshold*}

| Syntax Description | | |
|---|---|---|
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| **dtpc** | Specifies Dynamic Transport Power Control (DTPC) settings. | |
| | **Note** | This option is enabled by default. |
| **exp-bwreq** | Specifies Cisco Client eXtension (CCX) version 5 expedited bandwidth request feature. | |
| | **Note** | The expedited bandwidth request feature is disabled by default. |
| **fragmentation** *threshold* | Specifies the fragmentation threshold. | |
| | **Note** | This option can only used be when the network is disabled using the **ap dot11** {**24ghz | 5ghz**} **shutdown** command. |
| *threshold* | Threshold. The range is from 256 to 2346 bytes (inclusive). | |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    When the CCX version 5 expedited bandwidth request feature is enabled, the switch configures all joining access points for this feature.

This example shows how to enable DTPC for the 5 GHz band:

```
Switch(config)# ap dot11 5ghz dtpc
```

This example shows how to enable the CCX expedited bandwidth settings:

```
Switch(config)# ap dot11 5ghz exp-bwrep
```

This example shows how to configure the fragmentation threshold on the 5 GHz band with the threshold number of 1500 bytes:

```
Switch(config)# ap dot11 5ghz fragmentation 1500
```

**Related Topics**

# ap dot11 edca-parameters

To enable a specific enhanced distributed channel access (EDCA) profile on the 2.4 GHz or 5 GHz bands, use the **ap dot11 edca-parameters** command. To disable an EDCA profile on the 2.4 GHz or 5 GHz bands, use the **no** form of this command.

**ap dot11** {**24ghz**|**5ghz**} **edca-parameters**
{**custom-voice**|**optimized-video-voice**|**optimized-voice**|**svp-voice**|**wmm-default**}
**no ap dot11** {**24ghz**|**5ghz**} **edca-parameters**
{**custom-voice**|**optimized-video-voice**|**optimized-voice**|**svp-voice**|**wmm-default**}

| Syntax Description | | |
|---|---|---|
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |
| | **edca-parameters** | Specifies a specific enhanced distributed channel access (EDCA) profile on the 802.11 networks. |
| | **custom-voice** | Enables custom voice EDCA parameters. |
| | **optimized-video-voice** | Enables EDCA voice- and video-optimized profile parameters. Choose this option when both voice and video services are deployed on your network. |
| | **optimized-voice** | Enables EDCA voice-optimized profile parameters. Choose this option when voice services other than SpectraLink are deployed on your network. |
| | **svp-voice** | Enables SpectraLink voice priority parameters. Choose this option if SpectraLink phones are deployed on your network to improve the quality of calls. |
| | **wmm-default** | Enables the Wi-Fi Multimedia (WMM) default parameters. Choose this option when voice or video services are not deployed on your network. |

**Command Default**    **wmm-default**

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |
| 10.3 | The **custom-voice** keyword was removed for Cisco 5700 Series WLC. |

This example shows how to enable SpectraLink voice priority parameters:

```
Switch(config)# ap dot11 24ghz edca-parameters svp-voice
```

# ap dot11 rrm group-mode

To set the 802.11 automatic RF group selection mode on, use the **ap dot11 rrm group-mode** command. To set the 802.11 automatic RF group selection mode off, use the **no** form of this command.

**ap dot11** {**5ghz|24ghz**} **rrm group-mode** {**auto|leader|off|restart**}
**no ap dot11** {**5ghz|24ghz**} **rrm group-mode**

| Syntax Description | | |
|---|---|---|
| | **5ghz** | Specifies the 2.4 GHz band. |
| | **24ghz** | Specifies the 5 GHz band. |
| | **auto** | Sets the 802.11 RF group selection to automatic update mode. |
| | **leader** | Sets the 802.11 RF group selection to static mode, and sets this switch as the group leader. |
| | **off** | Sets the 802.11 RF group selection to off. |
| | **restart** | Restarts the 802.11 RF group selection. |

**Command Default**   auto

**Command Modes**   Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to turn the auto RF group selection mode on the 5 GHz band:

```
Switch(config)# ap dot11 5ghz rrm group-mode auto
```

**Related Topics**

ap dot11 rrm ccx location-measurement, on page 51
ap dot11 rrm channel cleanair-event, on page 46
ap dot11 rrm channel dca, on page 52
ap dot11 rrm group-member, on page 54
ap dot11 rrm logging, on page 55
ap dot11 rrm monitor, on page 57
ap dot11 rrm ndp-type, on page 59

# ap dot11 rrm channel cleanair-event

To configure CleanAir event-driven Radio Resource Management (RRM) parameters for all 802.11 Cisco lightweight access points, use the **ap dot11 rrm channel cleanair-event** command. When this parameter is configured, CleanAir access points can change their channel when a source of interference degrades the operations, even if the RRM interval has not expired yet.

**ap dot11** {**24ghz|5ghz**} **rrm channel** {**cleanair-event sensitivity** *value*}

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **sensitivity** | Sets the sensitivity for CleanAir event-driven RRM. |
| *value* | Sensitivity value. You can specify any one of the following three optional sensitivity values:<br><br>• **low**—Specifies low sensitivity.<br><br>• **medium**—Specifies medium sensitivity.<br><br>• **high**—Specifies high sensitivity. |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to set the high sensitivity for CleanAir event-driven RRM:

```
Switch(config)# ap dot11 24ghz rrm channel cleanair-event sensitivity high
```

**Related Topics**

# ap dot11 l2roam rf-params

To configure the 2.4 GHz or 5 GHz Layer 2 client roaming parameters, use the **ap dot11 l2roam rf-params** command.

**ap dot11** {**24ghz|5ghz**} **l2roam rf-params custom** *min-rssi roam-hyst scan-thresh trans-time*

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **custom** | Specifies custom Layer 2 client roaming RF parameters. |
| *min-rssi* | Minimum received signal strength indicator (RSSI) that is required for the client to associate to the access point. If the client's average received signal power dips below this threshold, reliable communication is usually impossible. Clients must already have found and roamed to another access point with a stronger signal before the minimum RSSI value is reached. The valid range is –80 to –90 dBm, and the default value is –85 dBm. |
| *roam-hyst* | How much greater the signal strength of a neighboring access point must be in order for the client to roam to it. This parameter is intended to reduce the amount of roaming between access points if the client is physically located on or near the border between the two access points. The valid range is 2 to 4 dB, and the default value is 2 dB. |
| *scan-thresh* | Minimum RSSI that is allowed before the client should roam to a better access point. When the RSSI drops below the specified value, the client must be able to roam to a better access point within the specified transition time. This parameter also provides a power-save method to minimize the time that the client spends in active or passive scanning. For example, the client can scan slowly when the RSSI is above the threshold and scan more rapidly when the RSSI is below the threshold. The valid range is –70 to –77 dBm, and the default value is –72 dBm. |
| *trans-time* | Maximum time allowed for the client to detect a suitable neighboring access point to roam to and to complete the roam, whenever the RSSI from the client's associated access point is below the scan threshold. The valid range is 1 to 10 seconds, and the default value is 5 seconds. |

**Command Default**

| | |
|---|---|
| *min-rssi* | -85 |
| *roam-hyst* | 2 |
| *scan-thresh* | -72 |
| *trans-time* | 5 |

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure custom Layer 2 client roaming parameters on an 802.11a network:

```
Switch(config)# ap dot11 5ghz l2roam rf-params custom -80 2 -70 7
```

# ap dot11 media-stream

To configure media stream multicast-direct and video-direct settings on an 802.11 network, use the **ap dot11 media-stream** command.

**ap dot11** {**24ghz**|**5ghz**} **media-stream** {**multicast-direct** {**admission-besteffort**|**client-maximum** *value*|**radio-maximum** *value*}|**video-redirect**}

| Syntax Description | | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **multicast-direct** | Specifies the multicast-direct for the 2.4 GHz or a 5 GHz band. |
| **admission-besteffort** | Admits the media stream to the best-effort queue. |
| **client-maximum** *value* | Specifies the maximum number of streams allowed on a client. |
| **radio-maximum** *value* | Specifies the maximum number of streams allowed on a 2.4 GHz or a 5 GHz band. |
| **video-redirect** | Specifies the media stream video-redirect for the 2.4 GHz or a 5 GHz band. |

**Command Default**

None

**Command Modes**

Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

Before you configure the media stream multicast-direct or video-redirect on a 802.11 network, ensure that the network is nonoperational.

This example shows how to enable media stream multicast-direct settings on the 5 GHz band:

```
Switch(config)# ap dot11 5ghz media-stream multicast-direct
```

This example shows how to admit the media stream to the best-effort queue if there is not enough bandwidth to prioritize the flow:

```
Switch(config)# ap dot11 5ghz media-stream multicast-direct admission-besteffort
```

This example shows how to set the maximum number of streams allowed on a client:

```
Switch(config)# ap dot11 5ghz media-stream multicast-direct client-maximum 10
```

This example shows how to enable media stream traffic redirection on the 5 GHz band:

```
Switch(config)# ap dot11 5ghz media-stream video-redirect
```

# ap dot11 rrm ccx location-measurement

To configure cisco client Extensions (CCX) client location measurements for 2.4 GHz and 5 GHz bands, use the **ap dot11 rrm ccx location-measurement** command.

**ap dot11** {**24ghz|5ghz**} **rrm ccx location-measurement** {**disable***interval*}

| | |
|---|---|
| **Syntax Description** | |

| | |
|---|---|
| **24ghz** | Specifies the 2.4-GHz band. |
| **5ghz** | Specifies the 5-GHz band. |
| **disable** | Disables support for CCX client location measurements. |
| *interval* | Interval from 10 to 32400. |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to disable support for 2.4 GHz CCX client location measurements:

```
Switch(config)# no ap dot11 24ghz rrm ccx location-measurement
```

**Related Topics**

ap dot11 rrm group-mode, on page 45
ap dot11 rrm channel cleanair-event, on page 46
ap dot11 rrm channel dca, on page 52
ap dot11 rrm group-member, on page 54
ap dot11 rrm logging, on page 55
ap dot11 rrm monitor, on page 57
ap dot11 rrm ndp-type, on page 59

# ap dot11 rrm channel dca

To configure Dynamic Channel Assignment (DCA) algorithm parameters on 802.11 networks, use the **ap dot11 rrm channel dca** command.

**ap dot11** {**24ghz**|**5ghz**} **rrm channel dca**{*channel_number*|**anchor-time** *value*|**global**{**auto**|**once**}|**interval** *value*|**min-metric** *value*|**sensitivity**{**high**|**low**|**medium**}}

| Syntax Description | | |
|---|---|---|
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| *channel_number* | Channel number to be added to the DCA list. **Note** The range is from 1 to 14. | |
| **anchor-time** | Specifies the anchor time for DCA. | |
| *value* | Hour of time between 0 and 23. These values represent the hour from 12:00 a.m. to 11:00 p.m. | |
| **global** | Specifies the global DCA mode for the access points in the 802.11 networks. | |
| **auto** | Enables auto-RF. | |
| **once** | Enables one-time auto-RF. | |
| **interval** | Specifies how often the DCA is allowed to run. | |
| *value* | Interval between the times when DCA is allowed to run. Valid values are 0, 1, 2, 3, 4, 6, 8, 12, or 24 hours. 0 is 10 minutes (600 seconds). Default value is 0 (10 minutes). | |
| **min-metric** | Specifies the DCA minimum RSSI energy metric. | |
| *value* | Minimum RSSI energy metric value from –100 to –60. | |
| **sensitivity** | Specifies how sensitive the DCA algorithm is to environmental changes (for example, signal, load, noise, and interference) when determining whether or not to change channels. | |
| **high** | Specifies that the DCA algorithm is not particularly sensitive to environmental changes. See the "Usage Guidelines" section for more information. | |
| **low** | Specifies that the DCA algorithm is moderately sensitive to environmental changes. See the "Usage Guidelines" section for more information. | |
| **medium** | Specifies that the DCA algorithm is highly sensitive to environmental changes. See the "Usage Guidelines" section for more information. | |

**Command Default**    None

**Command Modes**    Global configuration

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

The DCA sensitivity thresholds vary by radio band as shown in the table below.

To aid in troubleshooting, the output of this command shows an error code for any failed calls. The table below explains the possible error codes for failed calls.

*Table 1: DCA Sensitivity Threshold*

| Sensitivity | 2.4 Ghz DCA Sensitivity Threshold | 5 Ghz DCA Sensitivity Threshold |
|---|---|---|
| High | 5 dB | 5 dB |
| Medium | 15 dB | 20 dB |
| Low | 30 dB | 35 dB |

This example shows how to configure the switch to start running DCA at 5 pm for the 2.4 GHz band:

```
Switch(config)# ap dot11 24ghz rrm channel dca anchor-time 17
```

This example shows how to set the DCA algorithm to run every 10 minutes for the 2.4 GHz band:

```
Switch(config)# ap dot11 24ghz rrm channel dca interval 0
```

This example shows how to configure the value of DCA algorithm's sensitivity to low on the 2.4 GHz band:

```
Switch(config)# ap dot11 24ghz rrm channel dca sensitivity low
```

**Related Topics**

# ap dot11 rrm group-member

To configure members in an 802.11 static RF group, use the **ap dot11 rrm group-member** command. To remove members from 802.11 RF group, use the **no** form of this command.

**ap dot11** {**24ghz|5ghz**} **rrm group-member** *controller-name  controller-ip*
**no ap dot11** {**24ghz|5ghz**} **rrm group-member** *controller-name  controller-ip*

| Syntax Description | | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| *controller-name* | Name of the switch to be added. |
| *controller-ip* | IP address of the switch to be added. |

**Command Default**   None

**Command Modes**   Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to add a switch in the 5 GHz band RF group:

```
Switch(config)# ap dot11 5ghz rrm group-member cisco-controller 192.0.2.54
```

**Related Topics**

ap dot11 rrm ccx location-measurement, on page 51
ap dot11 rrm channel cleanair-event, on page 46
ap dot11 rrm channel dca, on page 52
ap dot11 rrm group-mode, on page 45
ap dot11 rrm logging, on page 55
ap dot11 rrm monitor, on page 57
ap dot11 rrm ndp-type, on page 59

# ap dot11 rrm logging

To configure report log settings on supported 802.11 networks, use the **ap dot11 rrm logging** command.

**ap dot11** {**24ghz|5ghz**} **rrm logging** {**channel|coverage|foreign|load|noise|performance|txpower**}

| Syntax Description | | |
| --- | --- | --- |
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |
| | **channel** | Turns the channel change logging mode on or off. The default mode is off (Disabled). |
| | **coverage** | Turns the coverage profile logging mode on or off. The default mode is off (Disabled). |
| | **foreign** | Turns the foreign interference profile logging mode on or off. The default mode is off (Disabled). |
| | **load** | Turns the load profile logging mode on or off. The default mode is off (Disabled). |
| | **noise** | Turns the noise profile logging mode on or off. The default mode is off (Disabled). |
| | **performance** | Turns the performance profile logging mode on or off. The default mode is off (Disabled). |
| | **txpower** | Turns the transit power change logging mode on or off. The default mode is off (Disabled). |

**Command Default**  Disabled

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to turn the 5 GHz logging channel selection mode on:

```
Switch(config)# ap dot11 5ghz rrm logging channel
```

This example shows how to turn the 5 GHz coverage profile violation logging selection mode on:

```
Switch(config)# ap dot11 5ghz rrm logging coverage
```

This example shows how to turn the 5 GHz foreign interference profile violation logging selection mode on:

```
Switch(config)# ap dot11 5ghz rrm logging foreign
```

This example shows how to turn the 5 GHz load profile logging mode on:

```
Switch(config)# ap dot11 5ghz rrm logging load
```

This example shows how to turn the 5 GHz noise profile logging mode on:

```
Switch(config)# ap dot11 5ghz rrm logging noise
```

This example shows how to turn the 5 GHz performance profile logging mode on:

```
Switch(config)# ap dot11 5ghz rrm logging performance
```

This example shows how to turn the 5 GHz transmit power change mode on:

```
Switch(config)# ap dot11 5ghz rrm logging txpower
```

**Related Topics**

# ap dot11 rrm monitor

To Configure monitor settings on the 802.11 networks, use the **ap dot11 rrm monitor** command.

**ap dot11** {**24ghz|5ghz**} **rrm monitor**{**channel-list**|{**all|country|dca**}|**coverage|load|noise|signal**} *seconds*

| | |
|---|---|
| **24ghz** | Specifies the 802.11b parameters. |
| **5ghz** | Specifies the 802.11a parameters. |
| **channel-list all** | Monitors the noise, interference, and rogue monitoring channel list for all channels. |
| **channel-list country** | Monitors the noise, interference, and rogue monitoring channel list for the channels used in the configured country code. |
| **channel-list dca** | Monitors the noise, interference, and rogue monitoring channel list for the channels used by automatic channel assignment. |
| **coverage** | Specifies the coverage measurement interval. |
| **load** | Specifies the load measurement interval. |
| **noise** | Specifies the noise measurement interval. |
| **signal** | Specifies the signal measurement interval. |
| **rssi-normalization** | Configure RRM Neighbor Discovery RSSI Normalization. |
| *seconds* | Measurement interval time from 60 to 3600 seconds. |

**Syntax Description** is the label for the table above.

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to monitor the channels used in the configured country:

```
Switch(config)# ap dot11 24ghz rrm monitor channel-list country
```

This example shows how to set the coverage measurement interval to 60 seconds:

```
Switch(config)# ap dot11 24ghz rrm monitor coverage 60
```

**Related Topics**

ap dot11 rrm ccx location-measurement, on page 51

# ap dot11 rrm ndp-type

To configure the 802.11 access point radio resource management neighbor discovery protocol type, use the **ap dot11 rrm ndp-type** command.

**ap dot11** {**24ghz|5ghz**} **rrm ndp-type** {**protected|transparent**}

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **protected** | Specifies the Tx RRM protected (encrypted) neighbor discovery protocol. |
| **transparent** | Specifies the Tx RRM transparent (not encrypted) neighbor discovery protocol. |

**Command Default**

None

**Command Modes**

Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

Before you configure the 802.11 access point RRM neighbor discovery protocol type, ensure that you have disabled the network by entering the **ap dot11** {**24ghz | 5ghz**} **shutdown** command.

This example shows how to enable the 802.11a access point RRM neighbor discovery protocol type as protected:

```
Switch(config)# ap dot11 5ghz rrm ndp-type protected
```

**Related Topics**

# ap dot11 5ghz dot11ac frame-burst

To configure the 802.11ac Frame Burst use the **apdot115ghzdot11acframe-burst** command. Use the **no** forms to disable the bursting of 802.11ac A-MPDUs.

**ap dot115ghzdot11acframe-burst**

**noap dot115ghzdot11acframe-burst**

**ap dot115ghzdot11acframe-burstautomatic**

**noap dot115ghzdot11acframe-burstautomatic**

| Syntax Description | | |
|---|---|---|
| | **5ghz** | Configures the 802.11a parameters. |
| | **frame-burst** | Configures the bursting of 802.11ac A-MPDUs. |

**Command Default**  No

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.6E | This command was introduced. |

### Example

This is the example shows how to configure the bursting of 802.11ac A-MPDUs.

```
Switchap dot11 5ghz
  dot11ac frame-burst
```

# ap dot1x max-sessions

To configure the maximum number of simultaneous 802.1X sessions allowed per access point, use the **ap dot1x max-sessions** command.

**ap dot1x max-sessions** *num-of-sessions*

| Syntax Description | *num-of-sessions* | Number of maximum 802.1X sessions initiated per AP at a time. The range is from 0 to 255, where 0 indicates unlimited. |
|---|---|---|

**Command Default**  None

**Command Modes**  Global configuration

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  It is required to limit the number of simultaneous 802.1X sessions initiated per access point to protect against flooding attacks caused by using 802.1X messages.

This example shows how to configure the maximum number of simultaneous 802.1X sessions:

```
Switch(config)# ap dot1x max-sessions 100
```

Cisco Lightweight Access Point Commands

ap dot1x username

# ap dot1x username

To configure the 802.1X username and password for all access points that are currently joined to the switch and any access points that join the switch in the future, use the **ap dot1x username** command. To disable the 802.1X username and password for all access points that are currently joined to the switch, use the **no** form of this command.

**ap dot1x username** *user-id* **password**{**0**|**8**} *password-string*
**no ap dot1x username** *user-id***password**{**0**|**8**} *password-string*

**Syntax Description**

| | |
|---|---|
| *user-id* | Username. |
| **password** | Specifies an 802.1X password for all access points. |
| **0** | Specifies an unencrypted password. |
| **8** | Specifies an AES encrypted password. |
| *password_string* | Password. |

**Command Default**　　None

**Command Modes**　　Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**　　You should enter a strong password. Strong passwords have the following characteristics:

- They are at least eight characters long.
- They contain a combination of uppercase and lowercase letters, numbers, and symbols.
- They are not words in any language.

You can set the values for a specific access point.

This example shows how to configure the global authentication username and password for all access points:

```
Switch(config)# ap dot1x username cisco123 password 0 cisco2020
```

**Related Topics**

show ap summary, on page 234

**Cisco Lightweight Access Point Commands**

**62**

# ap ethernet duplex

To configure the Ethernet port duplex and speed settings of the lightweight access points, use the **ap ethernet duplex** command. To disable the Ethernet port duplex and speed settings of lightweight access points, use the **no** form of this command.

**ap ethernet duplex** *duplex* **speed** *speed*
**no ap ethernet**

| **Syntax Description** | *duplex* | Ethernet port duplex settings. You can specify the following options to configure the duplex settings: <ul><li>**auto**—Specifies the Ethernet port duplex auto settings.</li><li>**half**—Specifies the Ethernet port duplex half settings.</li><li>**full**—Specifies the Ethernet port duplex full settings.</li></ul> |
| --- | --- | --- |
| | **speed** | Specifies the Ethernet port speed settings. |
| | *speed* | Ethernet port speed settings. You can specify the following options to configure the speed settings: <ul><li>**auto**—Specifies the Ethernet port speed to auto.</li><li>**10**—Specifies the Ethernet port speed to 10 Mbps.</li><li>**100**—Specifies the Ethernet port speed to 100 Mbps.</li><li>**1000**—Specifies the Ethernet port speed to 1000 Mbps.</li></ul> |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the Ethernet port duplex full settings as 1000 Mbps for all access points:

```
Switch(config)# ap ethernet duplex full speed 1000
```

**Related Topics**

show ap summary, on page 234

# ap group

To create a new access point group, use the **ap group** command. To remove an access point group, use the **no** form of this command.

**ap group** *group-name*
**no ap group** *group-name*

| | |
|---|---|
| **Syntax Description** | *group-name*    Access point group name. |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    An error message appears if you try to delete an access point group that is used by at least one access point. Before you can delete an AP group, move all APs in this group to another group. The access points are not moved to the default-group access point group automatically. To see the APs, enter the **show ap summary** command. To move access points, enter the **ap name** *Cisco-AP* **ap-groupname** *Group-Name* command.

This example shows how to create a new access point group:

```
Switch(config)# ap group sampleapgroup
```

**Related Topics**

# ap image

To configure an image on all access points that are associated to the switch, use the **ap image** command.

**ap image** {**predownload|reset|swap**}

| Syntax Description | | |
| --- | --- | --- |
| **predownload** | Instructs all the access points to start predownloading an image. |
| **reset** | Instructs all the access points to reboot. |
| **swap** | Instructs all the access points to swap the image. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to predownload an image to all access points:

```
Switch# ap image predownload
```

This example shows how to reboot all access points:

```
Switch# ap image reset
```

This example shows how to swap the access point's primary and secondary images:

```
Switch# ap image swap
```

**Related Topics**

show ap image, on page 184

# ap ipv6 tcp adjust-mss

To configure IPv6 TCP maximum segment size (MSS) value for all Cisco APs, use the **ap ipv6 tcp adjust-mss** command.

**ap ipv6 tcp adjust-mss** *size*
**no ap ipv6 tcp adjust-mss** *size*

**Syntax Description**

| | |
|---|---|
| **adjust-mss** | Configures IPv6 TCP MSS settings for all Cisco APs. |
| *size* | MSS value in the range of 500 to 1440. |

**Command Default**    None

**Command Modes**    Global configuration.

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Usage Guidelines**    The MSS value must be in the range of 500 to 1440.

This example shows how to configure the IPv6 TCP MSS value to 600 for all Cisco APs:

```
Switch(config)# ap ipv6 tcp adjust-mss 600
```

# ap led

To enable the LED state for an access point, use the **ap led** command. To disable the LED state for an access point, use the **no** form of this command.

**ap led**
**no ap led**

| Syntax Description | This command has no keywords and arguments. |
| --- | --- |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the LED state for an access point:

```
Switch(config)# ap led
```

# ap link-encryption

To enable Datagram Transport Layer Security (DTLS) data encryption for access points, use the **ap link-encryption** command. To disable the DTLS data encryption for access points, use the **no** form of this command.

**ap   link-encryption**
**no   ap   link-encryption**

| | |
|---|---|
| **Syntax Description** | This command has no keywords and arguments. |

| | |
|---|---|
| **Command Default** | Disabled |

| | |
|---|---|
| **Command Modes** | Global configuration |

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable data encryption for all the access points that are joined to the controller:

```
Switch(config)# ap link-encryption
```

**Related Topics**

# ap link-latency

To enable link latency for all access points that are currently associated to the switch, use the **ap link-latency** command. To disable link latency all access points that are currently associated to the switch, use the **no** form of this command.

**ap link-latency** [**reset**]
**no ap link-latency**

| Syntax Description | | |
|---|---|---|
| | **reset** | (Optional) Resets all link latency for all access points. |

**Command Default**

Link latency is disabled by default.

**Command Modes**

Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

This command enables or disables link latency only for those access points that are currently joined to the switch. It does not apply to access points that join in the future.

This example shows how to enable the link latency for all access points:

```
Switch(config)# ap link-latency
```

**Related Topics**

# ap mgmtuser username

To configure the username, password, and secret password for access point management, use the **ap mgmtuser username** command.

**ap mgmtuser username** *username* **password** *password_type password* **secret** *secret_type secret*

| Syntax Description | *username* | Specifies the username for access point management. |
| --- | --- | --- |
| | **password** | Specifies the password for access point management. |
| | *password_type* | Password type. You can specify any one of the following two password types:<br><br>• **0**—Specifies that an unencrypted password will follow.<br><br>• **8**—Specifies that an AES encrypted password will follow. |
| | *password* | Access point management password.<br><br>**Note** The password does not get encrypted by service-password encryption. |
| | **secret** | Specifies the secret password for privileged access point management. |
| | *secret_type* | Secret type. You can specify any one of the following two secret types:<br><br>• **0**—Specifies that an unencrypted secret password will follow.<br><br>• **8**—Specifies that an AES encrypted secret password will follow. |
| | *secret* | Access point management secret password. |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    To specify a strong password, the following password requirements should be met:

• The password should contain characters from at least three of the following classes: lowercase letters, uppercase letters, digits, and special characters.

- No character in the password can be repeated more than three times consecutively.

- The password should not contain a management username or the reverse of a username.

- The password should not contain words such as Cisco, oscic, admin, nimda or any variant obtained by changing the capitalization of letters by substituting 1, |, or ! or substituting 0 for o or substituting $ for s.

To specify a strong secret password, the following requirement should be met:

- The secret password should contain characters from at least three of the following classes: lowercase letters, uppercase letters, digits, or special characters.

This example shows how to add a username, password, and secret password for access point management:

```
Switch(config)# ap mgmtuser username glbusr password 0 Arc_1234 secret 0 Mid_1234
```

# ap name ap-groupname

To add a Cisco lightweight access point to a specific access point group, use the **ap name ap-groupname** command.

**ap** **name** *ap-name* **ap-groupname** *group-name*

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | *group-name* | Descriptive name for the access point group. |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** The Cisco lightweight access point must be disabled before changing this parameter.

This example shows how to add the access point AP01 to the access point group superusers:

```
Switch# ap name AP01 ap-groupname superusers
```

**Related Topics**

# ap name antenna band mode

To configure the antenna mode, use the **ap name<AP name> antenna-band-mode{ single | dual }** command.

**ap  name***ap-name* **antenna-band-mode**{**single**|**dual**}

| Syntax Description | *ap- name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | **antenna-band-mode** | Instructs the access point to enable the band mode of antenna. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Example**

This example shows how to configure the antenna band mode of access point.

```
Switchap name <ap-name> antenna-band-mode single
```

# ap name bhrate

To configure the Cisco bridge backhaul Tx rate, use the **ap name bhrate** command.

**ap name** *ap-name* **bhrate** *kbps*

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the Cisco access point. | |
| *kbps* | Cisco bridge backhaul Tx rate in kbps. The valid values are 6000, 12000, 18000, 24000, 36000, 48000, and 54000. | |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the Cisco bridge backhaul Tx rate to 54000 kbps:

```
Switch# ap name AP02 bhrate 54000
```

# ap name bridgegroupname

To set a bridge group name on a Cisco lightweight access point, use the **ap name bridgegroupname** command. To delete a bridge group name on a Cisco lightweight access point, use the **no** form of this command.

**ap name** *ap-name* **bridgegroupname** *bridge_group_name*
**ap name** *ap-name* **no bridgegroupname**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  Only access points with the same bridge group name can connect to each other. Changing the access point bridgegroupname may strand the bridge access point.

This example shows how to set a bridge group name on Cisco access point's bridge group name AP02:

```
Switch# ap name AP02 bridgegroupname West
```

This example shows how to delete a bridge group name on Cisco access point's bridge group name AP02:

```
Switch# ap name AP02 no bridgegroupname
```

# ap name bridging

To enable Ethernet-to-Ethernet bridging on a Cisco lightweight access point, use the **ap name bridging** command. To disable Ethernet-to-Ethernet bridging on a Cisco lightweight access point, use the **no** form of this command.

**ap name** *ap-name* **bridging**
**ap name** *ap-name* **no bridging**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable Ethernet-to-Ethernet bridging on an access point:

```
Switch# ap name TSIM_AP2 bridging
```

**Related Topics**

ap bridging, on page 7

# ap name cdp interface

To enable the Cisco Discovery Protocol (CDP) on a Cisco lightweight access point, use the **ap name** command. To disable the Cisco Discovery Protocol (CDP) on a Cisco lightweight access point, use the **no** form of this command.

**ap name** *ap-name* **cdp interface** {**ethernet** *ethernet-id*|**radio** *radio-id*}
**ap name** *ap-name* [**no**] **cdp interface** {**ethernet** *ethernet-id*|**radio** *radio-id*}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | **ethernet** | Enables CDP on an Ethernet interface. |
| | *ethernet-id* | Ethernet interface number from 0 to 3. |
| | **radio** | Enables CDP for a radio interface. |
| | *radio-id* | Radio ID slot number from 0 to 3. |

**Command Default**  Disabled on all access points.

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  CDP over Ethernet/radio interfaces is available only when CDP is enabled. After you enable CDP on all access points that are joined to the switch, you can disable and then reenable CDP on individual access points by using the **ap name** *ap-name* **cdp interface ethernet** *ethernet-id* cisco_ap command. After you disable CDP on all access points that are joined to the switch, you cannot enable and then disable CDP on individual access points.

This example shows how to enable CDP for Ethernet interface number 0 on an access point:

```
Switch# ap name TSIM_AP2 cdp interface ethernet 0
```

# ap name console-redirect

To redirect the remote debug output of a Cisco lightweight access point to the console, use the **ap name console-redirect** command. To disable the redirection of the remote debug output of a Cisco lightweight access point to the console, use the **no** form of this command.

**ap name** *ap-name* **console-redirect**
**ap name** *ap-name* [**no**] **console-redirect**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable redirecting remote debug output of a Cisco access point named AP02 to the console:

```
Switch# ap name AP02 console-redirect
```

# ap name capwap retransmit

To configure the access point control packet retransmission interval and control packet retransmission count, use the **ap name capwap retransmit** command.

**ap name** *ap-name* **capwap retransmit** {**count** *count-value*|**interval** *interval-time*}

| | | |
|---|---|---|
| **Syntax Description** | *ap-name* | Name of the Cisco lightweight access point. |
| | **count** | Sets the number of times control packet will be retransmitted. |
| | *count-value* | Number of times that the control packet will be retransmitted from 3 to 8. |
| | **interval** | Sets the control packet retransmission timeout interval. |
| | *interval-time* | Control packet retransmission timeout from 2 to 5 seconds. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the retransmission interval for an access point:

```
Switch# ap name AP01 capwap retransmit interval 5
```

This example shows how to configure the retransmission retry count for a specific access point:

```
Switch# ap name AP01 capwap retransmit count 5
```

# ap name command

To execute a command remotely on a specific Cisco access point, use the **ap name command** command.

**ap name** *ap-name* **command "***command* **"**

| | |
|---|---|
| **Syntax Description** | *ap-name* Name of the Cisco access point. |
| | *command* Command to be executed on a Cisco access point. |

| | |
|---|---|
| **Command Default** | None |
| **Command Modes** | Any command mode |

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to remotely enter the **show ip interface brief** command on the Cisco access point named TSIM_AP2:

```
Switch# ap name AP2 command "show ip interface brief"
```

# ap name core-dump

To configure a Cisco lightweight access point's memory core dump, use the **ap name core-dump** command. To disable a Cisco lightweight access point's memory core dump, use the **no** form of this command.

**ap name** *ap-name* **core-dump** *tftp-ip-addr* *filename* {**compress|uncompress**}
**ap name** *ap-name* [**no**]**core-dump**

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the access point. |
| | *tftp-ip-addr* | IP address of the TFTP server to which the access point sends core dump files. |
| | *filename* | Name that the access point used to label the core file. |
| | **compress** | Compresses the core dump file. |
| | **uncompress** | Uncompresses the core dump file. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   The access point must be able to reach the TFTP server before you can use this command.

This example shows how to configure and compress the core dump file:

```
Switch# ap name AP2 core-dump 192.1.1.1 log compress
```

**Related Topics**

ap core-dump, on page 13

# ap name country

To configure the country of operation for a Cisco lightweight access point, use the **ap name country** command.

**ap name** *ap-name* **country** *country-code*

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| *country-code* | Two-letter or three-letter country code. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    Cisco switchs must be installed by a network administrator or qualified IT professional and the installer must select the proper country code. Following installation, access to the unit should be password protected by the installer to maintain compliance with regulatory requirements and to ensure proper unit functionality. See the related product guide for the most recent country codes and regulatory domains. Also, access point regulatory domains are defined during the access point manufacturing process. You can change the access point country code if the new country code matches a country that is valid within the access point regulatory domain. If you try to enter a country that is not valid to the access point regulatory domain, the command fails.

This example shows how to configure the Cisco lightweight access point's country code to DE:

```
Switch# ap name AP2 country JP
```

**Related Topics**

# ap name crash-file

To manage crash data and radio core files for the Cisco access point, use the **ap name crash-file** command.

**ap name** *ap-name* **crash-file** {**get-crash-data**|**get-radio-core-dump** {**slot 0**|**slot 1**}}

| Syntax Description | | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **get-crash-data** | Collects the latest crash data for a Cisco lightweight access point. |
| **get-radio-core-dump** | Gets a Cisco lightweight access point's radio core dump |
| **slot** | Slot ID for Cisco access point. |
| **0** | Specifies Slot 0. |
| **1** | Specifies Slot 1. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to collect the latest crash data for access point AP3:

```
Switch# ap name AP3 crash-file get-crash-data
```

This example shows how to collect the radio core dump for access point AP02 and slot 0:

```
Switch# ap name AP02 crash-file get-radio-core-dump slot 0
```

**Related Topics**

# ap name dot11 24ghz rrm coverage

To configure coverage hole detection settings on the 2.4 GHz band, use the **ap name dot11 24ghz rrm coverage** command.

**ap name** *ap-name* **dot11 24ghz rrm coverage** {**exception** *value*|**level** *value*}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco access point. |
| | **exception** | Specifies the percentage of clients on an access point that are experiencing a low signal level but cannot roam to another access point. |
| | *value* | Percentage of clients. Valid values are from 0 to 100%.<br>**Note** The default is 25%. |
| | **level** | Specifies the minimum number of clients on an access point with a received signal strength indication (RSSI) value at or below the data or voice RSSI threshold. |
| | *value* | Minimum number of clients. Valid values are from 1 to 75.<br>**Note** The default is 3. |

**Command Default** The default for the *exception* parameter is 25% and the default for the *level* parameter is 3.

**Command Modes** Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** If you enable coverage hole detection, the switch automatically determines, based on data that is received from the access points, whether any access points have clients that are potentially located in areas with poor coverage.

If both the number and percentage of failed packets exceed the values that you entered in the **ap dot11 24ghz rrm coverage data packet-count** *count* and **ap dot11 24ghz rrm coverage data fail-percentage** *percentage* commands for a 5-second period, the client is considered to be in a pre-alarm condition. The switch uses this information to distinguish between real and false coverage holes and excludes clients with poor roaming logic. A coverage hole is detected if both the number and percentage of failed clients meet or exceed the values entered in the **ap dot11 24ghz rrm coverage exception** and **ap dot11 24ghz rrm coverage level** commands over a 90-second period. The switch determines whether the coverage hole can be corrected and, if appropriate, mitigates the coverage hole by increasing the transmit power level for that specific access point.

This example shows how to specify the percentage of clients for an access point 2.4 GHz radio that is experiencing a low signal level:

```
Switch# ap name AP2 dot11 24ghz rrm coverage exception 25%
```

This example shows how to specify the minimum number of clients on an 802.11b access point with an RSSI value at or below the RSSI threshold:

```
Switch# ap name AP2 dot11 24ghz rrm coverage level 60
```

**Related Topics**

# ap name dot11 49ghz rrm profile

To configure Radio Resource Management (RRM) performance profile settings for a Cisco lightweight access point on a 4.9 GHz public safety channel, use the **ap name dot11 49ghz rrm profile** command.

**ap name** *ap-name* **dot11 49ghz rrm profile** {**clients** *value*|**customize**|**exception** *value*|**foreign** *value*|**level** *value*|**noise** *value*|**throughput** *vaue*|**utilization** *value*}

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the Cisco lightweight access point. | |
| **clients** | Sets the access point client threshold. | |
| *value* | Access point client threshold from 1 to 75 clients. | |
| | **Note** | The default client threshold is 12. |
| **customize** | Turns on performance profile customization for an access point. | |
| | **Note** | Performance profile customization is off by default. |
| **exception** *value* | Sets the 802.11a Cisco access point coverage exception level from 0 to100 percent. | |
| **foreign** | Sets the foreign 802.11 transmitter interference threshold. | |
| *value* | Foreign 802.11 transmitter interference threshold from 0 to 100 percent. | |
| | **Note** | The default is 10 percent. |
| **level** *value* | Sets the 802.11a Cisco access point client minimum exception level from 1 to 75 clients. | |
| **noise** | Sets the 802.11 foreign noise threshold. | |
| *value* | 802.11 foreign noise threshold from –127 to 0 dBm. | |
| | **Note** | The default is –70 dBm. |
| **throughput** | Sets the data-rate throughput threshold. | |
| *value* | 802.11 throughput threshold from 1000 to 10000000 bytes per second. | |
| | **Note** | The default is 1,000,000 bytes per second. |
| **utilization** | Sets the RF utilization threshold. | |
| | **Note** | The operating system generates a trap when this threshold is exceeded. |
| *value* | 802.11 RF utilization threshold from 0 to 100 percent. | |
| | **Note** | The default is 80 percent. |

**Command Default**   None

| | |
|---|---|
| **Command Modes** | Any command mode |

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to set the AP1 clients threshold to 75 clients:

```
Switch# ap name AP1 dot11 49ghz rrm profile clients 75
```

This example shows how to turn performance on profile customization for Cisco lightweight access point AP1 on the 4.9 GHz channel:

```
Switch# ap name AP1 dot11 49ghz rrm profile customize
```

This example shows how to set the foreign transmitter interference threshold for AP1 to 0 percent:

```
Switch# ap name AP1 dot11 49ghz rrm profile foreign 0
```

This example shows how to set the foreign noise threshold for AP1 to 0 dBm:

```
Switch# ap name AP1 dot11 49ghz rrm profile noise 0
```

This example shows how to set the AP1 data-rate threshold to 10000000 bytes per second:

```
Switch# ap name AP1 dot11 49ghz rrm profile throughput 10000000
```

This example shows how to set the RF utilization threshold for AP1 to 100 percent:

```
Switch# ap name AP1 dot11 49ghz rrm profile utilization 100
```

**Related Topics**

# ap name dot11 5ghz rrm channel

To configure a new channel using an 802.11h channel announcement, use the **ap name dot11 5ghz rrm channel** command.

**ap name** *ap-name* **dot11 5ghz rrm channel** *channel*

| | |
|---|---|
| **Syntax Description** | *ap-name*    Name of the Cisco lightweight access point. |
| | *channel*    New channel. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure a new channel using the 802.11h channel:

```
Switch# ap name AP01 dot11 5ghz rrm channel 140
```

**Related Topics**

# ap name dot11 antenna

To configure radio antenna settings for Cisco lightweight access points on different 802.11 networks, use the **ap name dot11 antenna** command.

**ap name** *ap-name* **dot11** {**24ghz**|**5ghz**} **antenna** {**ext-ant-gain** *gain*|**mode** {**omni**|**sectorA**|**sectorB**}|**selection** {**external**|**internal**}}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |
| | **ext-ant-gain** | Specifies the external antenna gain for an 802.11 network. |
| | | **Note**    Before you enter this command, disable the Cisco radio by using the **ap dot11** {**24ghz** \| **5ghz**} **shutdown** command. After you enter this command, reenable the Cisco radio by using the **no ap dot11** {**24ghz** \| **5ghz**} **shutdown** command. |
| | *gain* | Antenna gain in 0.5 dBm units (for example, 2.5 dBm = 5). |
| | **mode** | Specifies that the Cisco lightweight access point is to use one internal antenna for an 802.11 sectorized 180-degree coverage pattern or both internal antennas for an 802.11 360-degree omnidirectional pattern. |
| | **omni** | Specifies to use both internal antennas. |
| | **sectorA** | Specifies to use only the side A internal antenna. |
| | **sectorB** | Specifies to use only the side B internal antenna. |
| | **selection** | Selects the internal or external antenna selection for a Cisco lightweight access point on an 802.11 network. |
| | **external** | Specifies the external antenna. |
| | **internal** | Specifies the internal antenna. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure a 5 GHz external antenna gain of 0.5 dBm for AP1:

```
Switch# ap name AP1 dot11 5ghz antenna ext-ant-gain 0.5
```

This example shows how to configure access point AP01 antennas for a 360-degree omnidirectional pattern on a 2.4 GHz band:

```
Switch# ap name AP01 dot11 24ghz antenna mode omni
```

This example shows how to configure access point AP02 on a 2.4 GHz band to use the internal antenna:

```
Switch# ap name AP02 dot11 24ghz antenna selection interval
```

**Related Topics**

# ap name dot11 antenna extantgain

To configure radio antenna settings for Cisco lightweight access points on 4.9 GHz and 5.8 GHz public safety channels, use the **ap name dot11 antenna extantgain** command.

**ap name** *ap-name* **dot11** {**49ghz|58ghz**} {**antenna extantgain** *gain*}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **49ghz** | Specifies 4.9 GHz public safety channel settings. |
| **58ghz** | Specifies 5.8 GHz public safety channel settings. |
| *gain* | Antenna gain in 0.5 dBm units (for example, 2.5 dBm = 5). |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** Before you enter this command, disable the Cisco radio by using the **ap dot11** {**24ghz | 5ghz**} **shutdown** command. After you enter this command, reenable the Cisco radio by using the **no ap dot11** {**24ghz | 5ghz**} **shutdown** command.

This example shows how to configure an external antenna gain of 0.5 dBm for AP1 on a 4.9 GHz public safety channel:

```
Switch# ap name AP1 dot11 49ghz antenna extantgain 0.5
```

**Related Topics**

ap name dot11 antenna, on page 89

# ap name dot11 cleanair

To configure CleanAir settings for a specific Cisco lightweight access point on 802.11 networks, use the **ap name dot11 cleanair** command.

**ap name** *ap-name* **dot11** {**24ghz|5ghz**} **cleanair**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |

**Command Default**  Disabled.

**Command Modes**  Any command mode

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable CleanAir on the 2.4 GHz band:

Switch# **ap name AP01 dot11 24ghz cleanair**

# ap name dot11 dot11n antenna

To configure an access point to use a specific antenna, use the **ap name dot11 dot11n antenna** command.

**ap name** *ap-name* **dot11** {**24ghz|5ghz**} **dot11n antenna** {**A|B|C|D**}

| | |
|---|---|
| **Syntax Description** | |

| *ap-name* | Access point name. |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **A** | Specifies antenna port A. |
| **B** | Specifies antenna port B. |
| **C** | Specifies antenna port C. |
| **D** | Specifies antenna port D. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable antenna B on access point AP02:

Switch# **ap name AP02 dot11 5ghz dot11n antenna B**

This example shows how to disable antenna C on access point AP02:

Switch# **ap name AP02 no dot11 5ghz dot11n C**

# ap name dot11 dual-band cleanair

To configure CleanAir for a dual band radio, use the **ap name dot11 dual-band cleanair** command.

**ap name** *ap-name* **dot11 dual-band cleanair**
**ap name** *ap-name* **no dot11 dual-band cleanair**

| | |
|---|---|
| **Syntax Description** | *ap-name*    Name of the Cisco AP. |
| | **cleanair**    Specifies the CleanAir feature. |

**Command Default**    None

**Command Modes**    Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

This example shows how to enable CleanAir for a dual band radio of the access point AP01:

```
Switch# ap name AP01 dot11 dual-band cleanair
```

**Related Topics**

# ap name dot11 dual-band shutdown

To disable dual band radio on a Cisco AP, use the **ap name dot11 dual-band shutdown** command.

**ap name** *ap-name* **dot11 dual-band shutdown**
**ap name** *ap-name* **no dot11 dual-band shutdown**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco AP. |
| **shutdown** | Disables the dual band radio on the Cisco AP. |

**Command Default**  None

**Command Modes**  Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

This example shows how to disable dual band radio on the Cisco access point AP01:

```
Switch# ap name AP01 dot11 dual-band shutdown
```

# ap name dot11 rrm ccx

To configure Cisco Client eXtension (CCX) Radio Resource Management (RRM) settings for specific Cisco lightweight access points on 802.11 networks, use the **ap name dot11 rrm ccx** command.

**ap name** *ap-name* **dot11** {**24ghz|5ghz**} **rrm ccx** {**customize|location-measurement** *interval*}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **customize** | Enables 802.11 CCX options. |
| **location-measurement** | Configures the CCX client location measurements. |
| *interval* | Interval from 10 to 32400. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure CCX client location measurements for an access point in the 2.4 GHz band:

```
Switch# ap name AP01 dot11 24ghz rrm ccx location-measurement 3200
```

**Related Topics**

ap name dot11 rrm profile, on page 97

# ap name dot11 rrm profile

To configure Radio Resource Management (RRM) performance profile settings for a Cisco lightweight access point, use the **ap name dot11 rrm profile** command.

**ap name** *ap-name* **dot11** {**24ghz**|**5ghz**} **rrm profile** {**clients** *value*|**customize**|**foreign** *value*|**noise** *value*|**throughput** *value*|**utilization** *value*}

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the Cisco lightweight access point. | |
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| **clients** | Sets the access point client threshold. | |
| *value* | Access point client threshold from 1 to 75 clients. | |
| | **Note** | The default client threshold is 12. |
| **customize** | Turns on performance profile customization for an access point. | |
| | **Note** | Performance profile customization is off by default. |
| **foreign** | Sets the foreign 802.11 transmitter interference threshold. | |
| *value* | Foreign 802.11 transmitter interference threshold from 0 to 100 percent. | |
| | **Note** | The default is 10 percent. |
| **noise** | Sets the 802.11 foreign noise threshold. | |
| *value* | 802.11 foreign noise threshold between –127 and 0 dBm. | |
| | **Note** | The default is —70 dBm. |
| **throughput** | Sets the data-rate throughput threshold. | |
| *value* | 802.11 throughput threshold from 1000 to 10000000 bytes per second. | |
| | **Note** | The default is 1,000,000 bytes per second. |
| **utilization** | Sets the RF utilization threshold. | |
| | **Note** | The operating system generates a trap when this threshold is exceeded. |
| *value* | 802.11 RF utilization threshold from 0 to 100 percent. | |
| | **Note** | The default is 80 percent. |

| | |
|---|---|
| **Command Default** | None |
| **Command Modes** | Any command mode |

| **Command History** | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to set the AP1 clients threshold to 75 clients:

```
Switch# ap name AP1 dot11 24ghz rrm profile clients 75
```

This example shows how to turn performance profile customization on for 802.11a Cisco lightweight access point AP1:

```
Switch# ap name AP1 dot11 5ghz rrm profile customize
```

This example shows how to set the foreign 802.11a transmitter interference threshold for AP1 to 0 percent:

```
Switch# ap name AP1 dot11 5ghz rrm profile foreign 0
```

This example shows how to set the 802.11a foreign noise threshold for AP1 to 0 dBm:

```
Switch# ap name AP1 dot11 5ghz rrm profile noise 0
```

This example shows how to set the AP1 data-rate threshold to 10000000 bytes per second:

```
Switch# ap name AP1 dot11 5ghz rrm profile throughput 10000000
```

This example shows how to set the RF utilization threshold for AP1 to 100 percent:

```
Switch# ap name AP1 dot11 5ghz rrm profile utilization 100
```

**Related Topics**

# ap name dot11 txpower

To configure the transmit power level for a single access point in an 802.11 network, use the **ap name dot11 txpower** command.

**ap name** *ap-name* **dot11** {**24ghz|5ghz**} {**shutdown|txpower** {**auto***power-level*}}

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the Cisco lightweight access point. | |
| **24ghz** | Specifies the 2.4 GHz band. | |
| **5ghz** | Specifies the 5 GHz band. | |
| **shutdown** | Disables the 802.11 networks. | |
| **auto** | Specifies the power level is automatically set by Radio Resource Management (RRM) for the 802.11 Cisco radio. | |
| *power-level* | Manual transmit power level number for the access point. | |

**Command Default** The command default (txpower auto) is for automatic configuration by RRM.

**Command Modes** Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to automatically set the 2.4 GHz radio transmit power for access point AP1:

```
Switch# ap name AP1 dot11 24ghz txpower auto
```

**Related Topics**

show ap config dot11, on page 162

# ap name dot1x-user

To configure the global authentication username and password for an access point that is currently joined to the switch, use the **ap name dot1x-user** command. To disable 802.1X authentication for a specific access point, use the **no** form of this command.

**ap name** *ap-name* **dot1x-user** {**global-override**|**username** *user-id* **password** *passwd*}
**ap name** *ap-name* [**no**] **dot1x-user**

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the access point. |
| | **global-override** | Forces the access point to use the switch's global authentication settings. |
| | **username** | Specifies to add a username. |
| | *user-id* | Username. |
| | **password** | Specifies to add a password. |
| | *passwd* | Password. |

**Command Default**　None

**Command Modes**　Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**　You should enter a strong password. Strong passwords have the following characteristics:

- They are at least eight characters long.

- They contain a combination of uppercase and lowercase letters, numbers, and symbols.

- They are not words in any language.

  You can set the values for a specific access point.

You can disable 802.1X authentication for a specific access point only if global 802.1X authentication is not enabled. If global 802.1X authentication is enabled, you can disable 802.1X for all access points only.

This example shows how to configure a specific username and password for dot1x authentication:

```
Switch# ap name AP02 dot1x-user username Cisco123 password Cisco2020
```

This example shows how to disable the authentication for access point cisco_ap1:

```
Switch# ap name cisco_ap1 no dot1x-user
```

**Related Topics**

# ap name ethernet

To configure ethernet port settings of a Cisco lightweight access point, use the **ap name ethernet** command. To remove configured port settings or set of defaults, use the **no** form of this command.

**ap name** *ap-name* **ethernet** *intf-number* **mode** {**access** *vlan-id*|**trunk** [{**add**|**delete**}]} **native-vlan** *vlan-id*
**ap name** *ap-name* **no ethernet** *intf-number* **mode** {**access**|**trunk native-vlan**}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | *intf-number* | Ethernet interface number from 0 to 3. |
| | **mode** | Configures access or trunk mode. |
| | **access** | Configures the port in access mode. |
| | *vlan-id* | VLAN identifier. |
| | **trunk** | Specifies the port in trunk mode. |
| | **add** | (Optional) Adds a VLAN or trunk mode. |
| | **delete** | (Optional) Deletes a VLAN or trunk mode. |
| | **native-vlan** | Specifies a native VLAN. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure access mode for a Cisco access point.

```
Switch# ap name AP2 ethernet 0 mode access 1
```

# ap name ethernet duplex

To configure the Ethernet port duplex and speed settings of the lightweight access points, use the **ap name ethernet duplex** command.

**ap name** *ap-name* **ethernet duplex** {**auto|full|half**} **speed**{**10|100|1000|auto**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco access point. |
| **auto** | Specifies the Ethernet port duplex auto settings. |
| **full** | Specifies the Ethernet port duplex full settings. |
| **half** | Specifies the Ethernet port duplex half settings. |
| **speed** | Specifies the Ethernet port speed settings. |
| **10** | Specifies the Ethernet port speed to 10 Mbps. |
| **100** | Specifies the Ethernet port speed to 100 Mbps. |
| **1000** | Specifies the Ethernet port speed to 1000 Mbps. |
| **auto** | Specifies the Ethernet port setting for all connected access points. |

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the Ethernet port to full duplex and 1 Gbps for an access point:

```
Switch# ap name AP2 ethernet duplex full 1000
```

**Related Topics**

show ap summary, on page 234

# ap name key-zeroize

To enable the FIPS key-zeroization on an Access Point, use the **ap name<AP name> key-zeroize**command.

**ap   name**ap-name **key-zeroize**

**Syntax Description**

| ap- name | Name of the Cisco lightweight access point. |
| key-zeroize | Instructs the access point to enable the FIPS key-zeroization on AP. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Example**

This example shows how to enable FIPS key-zeroization.

```
Switchap name <AP Name> key-zeroize
```

# ap name image

To configure an image on a specific access point, use the **ap name image** command.

**ap name** *ap-name* **image** {**predownload|swap**}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | **predownload** | Instructs the access point to start the image predownload. |
| | **swap** | Instructs the access point to swap the image. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to predownload an image to an access point:

```
Switch# ap name AP2 image predownload
```

This example shows how to swap an access point's primary and secondary images:

```
Switch# ap name AP2 image swap
```

**Related Topics**

show ap image, on page 184
ap image, on page 65

# ap name ipv6 tcp adjust-mss

To configure IPv6 TCP maximum segment size (MSS) value for a Cisco AP, use the **ap name ipv6 tcp adjust-mss** command.

**ap name** *ap-name* **ipv6 tcp adjust-mss** *size*
**ap name** *ap-name* **no ipv6 tcp adjust-mss**

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco AP. |
| | **adjust-mss** | Configures IPv6 TCP MSS settings for all Cisco APs. |
| | *size* | MSS value in the range of 500 to 1440. |

**Command Default**    None

**Command Modes**    Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Usage Guidelines**    The MSS value must be in the range of 500 to 1440.

This example shows how to configure the IPv6 TCP MSS value to 600 for a Cisco access point AP01:

```
Switch# ap name AP01 ipv6 tcp adjust-mss 600
```

# ap name jumbo mtu

To configure the Jumbo MTU support, use the **ap name<AP name>jumbo-mtu**command.

**ap  name***ap-name* {**jumbo-mtu|no jumbo-mtu**}

| Syntax Description | | |
|---|---|---|
| *ap- name* | Name of the Cisco lightweight access point. |
| **jumbo-mtu** | Instructs the access point to enable the Jumbo MTU support. |
| **no jumbo-mtu** | Instructs the access point to disable the Jumbo MTU support. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Example**

This example shows how to configure the Jumbo MTU support.

```
Switchap name <AP Name> jumbo-mtu
```

# ap name lan

To configure LAN port configurations for APs, use the **ap name lan** command. To remove LAN port configurations for APs, use the**ap name no lan** command.

**ap name** *ap-name* **[ no ]lan port-id** *port-id* {**shutdown**|**vlan-access**}

| | |
|---|---|
| Syntax Description | |

| | |
|---|---|
| **no** | Removes LAN port configurations. |
| **port-id** | Configures the port. |
| *port-id* | The ID of the port. The range is 1-4 |
| **shotdown** | Disables the Port. |
| **vlan-access** | Enables VLAN access to Port. |

**Command Default**  None

**Command Modes**  Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to enable VLAN access to port:

```
Switch# ap name AP1 lan port-id 1 vlan-access
```

# ap name led

To enable the LED state for an access point, use the **ap name led** command. To disable the LED state for an access point, use the **no** form of this command.

**ap name** *ap-name* **led**
**no ap name** *ap-name* [**led**] **led**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | **led** | Enables the access point's LED state. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the LED state for an access point:

```
Switch# ap name AP2 led
```

This example shows how to disable the LED state for an access point:

```
Switch# ap name AP2 no led
```

# ap name link-encryption

To enable Datagram Transport Layer Security (DTLS) data encryption for specific Cisco lightweight access points, use the **ap name link-encryption** command. To disable DTLS data encryption for specific Cisco lightweight access points, use the **no** form of this command.

**ap  name** *ap-name*  **link-encryption**
**ap  name** *ap-name*  **no  link-encryption**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable data encryption for an access point:

```
Switch# ap name AP02 link-encryption
```

# ap name link-latency

To enable link latency for a specific Cisco lightweight access point that is currently associated to the switch, use the **ap name link-latency** command. To disable link latency for a specific Cisco lightweight access point that is currently associated to the switch, use the **no** form of this command.

**ap name** *ap-name* **link-latency**
**ap name** *ap-name* **no link-latency**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|

**Command Default**  Link latency is disabled by default.

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  This command enables or disables link latency only for access points that are currently joined to the switch. It does not apply to access points that join in the future.

This example shows how to enable link latency on access points:

```
Switch# ap name AP2 link-latency
```

# ap name location

To modify the descriptive location of a Cisco lightweight access point, use the **ap name location** command.

**ap name** *ap-name* **location** *location*

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the Cisco lightweight access point. | |
| *location* | Location name of the access point (enclosed by double quotation marks). | |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  The Cisco lightweight access point must be disabled before changing this parameter.

This example shows how to configure the descriptive location for access point AP1:

```
Switch# ap name AP1 location Building1
```

**Related Topics**

show ap summary,

# ap name mgmtuser

To configure the username, password, and secret password for access point management, use the **ap name mgmtuser** command. To force a specific access point to use the switch's global credentials, use the **no** form of this command.

**ap name** *ap-name* **mgmtuser username** *username* **password** *password* **secret** *secret*
**ap name** *ap-name* **no mgmtuser**

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | **username** | Specifies the username for access point management. |
| | *username* | Management username. |
| | **password** | Specifies the password for access point management. |
| | *password* | Access point management password. |
| | **secret** | Specifies the secret password for privileged access point management. |
| | *secret* | Access point management secret password. |

**Command Default**   None

**Command Modes**   Any command mode

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   To specify a strong password, you should adhere to the following requirements:

- The password should contain characters from at least three of the following classes: lowercase letters, uppercase letters, digits, and special characters.

- No character in the password can be repeated more than three times consecutively.

- The password cannot contain a management username or the reverse of a username.

- The password cannot contain words such as Cisco, oscic, admin, nimda or any variant obtained by changing the capitalization of letters by substituting 1, |, or ! or substituting 0 for o or substituting $ for s.

The following requirement is enforced on the secret password:

- The secret password cannot contain characters from at least three of the following classes: lowercase letters, uppercase letters, digits, or special characters.

This example shows how to add a username, password, and secret password for access point management:

**ap name mgmtuser**

```
Switch# ap name AP01 mgmtuser username acd password Arc_1234 secret Mid_1234
```

# ap name mode

To change a Cisco switch communication option for an individual Cisco lightweight access point, use the **ap name mode** command.

**ap name** *ap-name* **mode**{**local submode**{**none**|**wips**}|**monitor submode**{**none**|**wips**}|**rogue**|**se-connect**|**sniffer**}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | **local** | Converts from an indoor mesh access point (MAP or RAP) to a nonmesh lightweight access point (local mode). |
| | **submode** | Specifies wIPS submode on an access point. |
| | **none** | Disables the wIPS on an access point. |
| | **monitor** | Specifies monitor mode settings. |
| | **wips** | Enables the wIPS submode on an access point. |
| | **rogue** | Enables wired rogue detector mode on an access point. |
| | **se-connect** | Enables spectrum expert mode on an access point. |
| | **sniffer** | Enables wireless sniffer mode on an access point. |

**Command Default**  Local

**Command Modes**  Any command mode

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**  The sniffer mode captures and forwards all the packets from the clients on that channel to a remote machine that runs AiroPeek or other supported packet analyzer software. It includes information on the timestamp, signal strength, packet size and so on.

This example shows how to set the switch to communicate with access point AP01 in local mode:

```
Switch# ap name AP01 mode local submode none
```

This example shows how to set the switch to communicate with access point AP01 in a wired rogue access point detector mode:

```
Switch# ap name AP01 mode rogue
```

This example shows how to set the switch to communicate with access point AP02 in wireless sniffer mode:

```
Switch# ap name AP02 mode sniffer
```

## Related Topics

# ap name monitor-mode

To configure Cisco lightweight access point channel optimization, use the **ap name monitor-mode** command.

**ap name** *ap-name* **monitor-mode** {**no-optimization|tracking-opt|wips-optimized**}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |
| | **no-optimization** | Specifies no channel scanning optimization for the access point. |
| | **tracking-opt** | Enables tracking optimized channel scanning for the access point. |
| | **wips-optimized** | Enables wIPS optimized channel scanning for the access point. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure a Cisco wireless intrusion prevention system (wIPS) monitor mode on access point AP01:

```
Switch# ap name AP01 monitor-mode wips
```

**Related Topics**

show ap monitor-mode summary, on page 190
show ap config, on page 165

# ap name monitor-mode dot11b

To configures 802.11b scanning channels for a monitor-mode access point, use the **ap name monitor-mode dot11b** command.

**ap name** *ap-name* **monitor-mode dot11b fast-channel** *channel1* [*channel2*] [*channel3*] [*channel4*]

| Syntax Description | | |
|---|---|
| *ap-name* | Name of the access point. |
| **fast-channel** | Specifies the 2.4 GHz band scanning channel (or channels) for a monitor-mode access point. |
| *channel1* | Scanning channel1. |
| *channel2* | (Optional) Scanning channel2. |
| *channel3* | (Optional) Scanning channel3. |
| *channel4* | (Optional) Scanning channel4. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure an access point in tracking optimized mode to listen to channels 1, 6, and 11:

```
Switch# ap name AP01 monitor-mode dot11b fast-channel 1 6 11
```

**Related Topics**

show ap monitor-mode summary, on page 190

# ap name name

To modify the name of a Cisco lightweight access point, use the **ap name name** command.

**ap name** *ap-name* **name** *new-name*

| Syntax Description | | |
|---|---|---|
| *ap-name* | Current Cisco lightweight access point name. | |
| *new-name* | Desired Cisco lightweight access point name. | |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to modify the name of access point AP1 to AP2:

```
Switch# ap name AP1 name AP2
```

**Related Topics**

show ap config, on page 165

# ap name no dot11 shutdown

To enable radio transmission for an individual Cisco radio on an 802.11 network, use the **ap name no dot11 shutdown** command.

**ap name** *ap-name* **no dot11**{**24ghz**|**5ghz**} **shutdown**

| | | |
|---|---|---|
| **Syntax Description** | *ap-name* | Name of the Cisco lightweight access point. |
| | **24ghz** | Specifies the 2.4 GHz radios. |
| | **5ghz** | Specifies the 5 GHz radios. |

**Command Default**      The transmission is enabled for the entire network by default.

**Command Modes**      Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

**Note**      Use this command with the **ap name** *Cisco-AP* **dot11 5ghz shutdown** command when configuring 802.11 settings.

This command can be used any time that the CLI interface is active.

This example shows how to enable radio transmission on the 5 GHz band for access point AP1:

```
Switch# ap name AP1 no dot11 5ghz shutdown
```

# ap name power

To enable the Cisco Power over Ethernet (PoE) feature for access points, use the **ap name power** command. To disable the Cisco PoE feature for access points, use the **no** form of this command.

**ap name** *ap-name* **power** {**injector|pre-standard**}
**ap name** *ap-name* **no power** {**injector|pre-standard**}

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the Cisco lightweight access point. | |
| **injector** | Specifies the power injector state for an access point. | |
| **pre-standard** | Enables the inline power Cisco prestandard switch state for an access point. | |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the power injector state for all access points:

```
Switch# ap name AP01 power injector
```

This example shows how to enable the inline power Cisco prestandard switch state for access point AP02:

```
Switch# ap name AP02 power pre-standard
```

# ap name shutdown

To disable a Cisco lightweight access point, use the **ap name shutdown** command. To enable a Cisco lightweight access point, use the **no** form of this command.

**ap name** *ap-name* **shutdown**
**ap name** *ap-name* **no shutdown**

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example how to disable a specific Cisco lightweight access point:

```
Switch# ap name AP2 shutdown
```

# ap name slot shutdown

To disable a slot on a Cisco lightweight access point, use the **ap name slot shutdown** command. To enable a slot on a Cisco lightweight access point, use the **no** form of the command.

**ap name** *ap-name* **slot** {**0|1|2|3**} **shutdown**
**ap name** *ap-name* **no slot** {**0|1|2|3**} **shutdown**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
| --- | --- | --- |
| | **0** | Enables slot number 0 on a Cisco lightweight access point. |
| | **1** | Enables slot number 1 on a Cisco lightweight access point. |
| | **2** | Enables slot number 2 on a Cisco lightweight access point. |
| | **3** | Enables slot number 3 on a Cisco lightweight access point. |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable slot 0 on a Cisco access point named TSIM_AP2:

```
Switch# ap name TSIM_AP2 no slot 0 shutdown
```

# ap name sniff

To enable sniffing on an access point, use the **ap name sniff** command. To disable sniffing on an access point, use the **no** form of this command.

**ap** **name** *ap-name* **sniff** {**dot11a|dot11b**}
**ap** **name** *ap-name* **no** **sniff** {**dot11a|dot11b**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **dot11a** | Specifies the 2.4 GHz band. |
| **dot11b** | Specifies the 5 GHz band. |
| *channel* | Valid channel to be sniffed. For the 5 GHz band, the range is 36 to 165. For the 2.4 GHz band, the range is 1 to 14. |
| *server-ip-address* | IP address of the remote machine running Omnipeek, Airopeek, AirMagnet, or Wireshark software. |

**Command Default** Channel 36

**Command Modes** Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** When the sniffer feature is enabled on an access point, it starts sniffing the signal on the given channel. It captures and forwards all the packets to the remote computer that runs Omnipeek, Airopeek, AirMagnet, or Wireshark software. It includes information about the timestamp, signal strength, packet size and so on.

Before an access point can act as a sniffer, a remote computer that runs one of the listed packet analyzers must be set up so that it can receive packets that are sent by the access point.

This example shows how to enable the sniffing on the 5 GHz band for an access point on the primary wireless LAN controller:

```
Switch# ap name AP2 sniff dot11a 36 192.0.2.54
```

# ap name ssh

To enable Secure Shell (SSH) connectivity on a specific Cisco lightweight access point, use the **ap name ssh** command. To disable SSH connectivity on a specific Cisco lightweight access point, use the **no** form of this command.

**ap name** *ap-name* **ssh**
**ap name** *ap-name* **no ssh**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
| --- | --- | --- |

**Command Default** None

**Command Modes** Any command mode

| Command History | Release | Modification |
| --- | --- | --- |
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** The Cisco lightweight access point associates with this Cisco switch for all network operations and in the event of a hardware reset.

This example shows how to enable SSH connectivity on access point Cisco_ap2:

```
Switch# ap name Cisco_ap2 ssh
```

# ap name telnet

To enable Telnet connectivity on an access point, use the **ap name telnet** command. To disable Telnet connectivity on an access point, use the **no** form of this command.

**ap name** *ap-name* **telnet**
**ap name** *ap-name* **no telnet**

| | |
|---|---|
| **Syntax Description** | *ap-name*   Name of the Cisco lightweight access point. |

| | |
|---|---|
| **Command Default** | None |

| | |
|---|---|
| **Command Modes** | Any command mode |

| **Command History** | **Release** | **Modification** |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to disable Telnet connectivity on access point cisco_ap1:

```
Switch# ap name cisco_ap1 no telnet
```

# ap name power injector

To configure the power injector state for an access point, use the **ap name power injector** command. To disable the Cisco Power over Ethernet (PoE) feature for access points, use the **no** form of this command.

**ap name** *ap-name* **power injector** {**installed|override|switch-mac-address** *switch-MAC-address*}
**ap name** *ap-name* **no power injector**

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of he Cisco lightweight access point. |
| | **installed** | Detects the MAC address of the current switch port that has a power injector. |
| | **override** | Overrides the safety checks and assumes a power injector is always installed. |
| | **switch-mac-address** | Specifies the MAC address of the switch port with an installed power injector. |
| | *switch-MAC-address* | MAC address of the switch port with an installed power injector. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the power injector state for an access point:

```
Switch# ap name AP01 power injector switch-mac-address aaaa.bbbb.cccc
```

# ap name power pre-standard

To enable the inline power Cisco prestandard switch state for an access point, use the **ap name power pre-standard** command. To disable the inline power Cisco prestandard switch state for an access point, use the **no** form of this command.

**ap name** *ap-name* **power pre-standard**
**ap name** *ap-name* **no power pre-standard**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the inline power Cisco prestandard switch state for access point AP02:

```
Switch# ap name AP02 power pre-standard
```

This example shows how to disable the inline power Cisco prestandard switch state for access point AP02:

```
Switch# ap name AP02 no power pre-standard
```

# ap name reset-button

To configure the Reset button for an access point, use the **ap name reset-button** command.

**ap name** *ap-name* **reset-button**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the Reset button for access point AP03:

```
Switch# ap name AP03 reset-button
```

# ap name reset

To reset a specific Cisco lightweight access point, use the **ap name reset** command.

**ap name** *ap-name* **reset**

**Syntax Description**

| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---------|-------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to reset a Cisco lightweight access point named AP2:

```
Switch# ap name AP2 reset
```

**Related Topics**

# ap name slot

To configure various slot parameters, use the **ap name slot** command. To disable a slot on a Cisco lightweight access point, use the **no** form of this command.

**ap name** *ap-name* **slot** *slot-number* {**channel** {**global**|**number** *channel-number*|**width** *channel-width*}|**rtsthreshold** *value*|**shutdown**|**txpower** {**global***channel-level*}}
**ap name** *ap-name* **no slot** {**0**|**1**|**2**|**3**} **shutdown**

| | |
|---|---|
| **Syntax Description** | |

| | |
|---|---|
| *ap-name* | Name of the Cisco access point. |
| *slot-number* | Slot downlink radio to which the channel is assigned. You can specify the following slot numbers: |
| | • **0**—Enables slot number 0 on a Cisco lightweight access point. |
| | • **1**—Enables slot number 1 on a Cisco lightweight access point. |
| | • **2**—Enables slot number 2 on a Cisco lightweight access point. |
| | • **3**—Enables slot number 3 on a Cisco lightweight access point. |
| **channel** | Specifies the channel for the slot. |
| **global** | Specifies channel global properties for the slot. |
| **number** | Specifies the channel number for the slot. |
| *channel-number* | Channel number from 1 to 169. |
| **width** | Specifies the channel width for the slot. |
| *channel-width* | Channel width from 20 to 40. |
| **rtsthreshold** | Specifies the RTS/CTS threshold for an access point. |
| *value* | RTS/CTS threshold value from 0 to 65535. |
| **shutdown** | Shuts down the slot. |
| **txpower** | Specifies Tx power for the slot. |
| **global** | Specifies auto-RF for the slot. |
| *channel-level* | Transmit power level for the slot from 1 to 7. |

| | |
|---|---|
| **Command Default** | None |
| **Command Modes** | Any command mode |

| | |
|---|---|
| **Command History** | |

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable slot 3 for the access point abc:

```
Switch# ap name abc slot 3
```

This example shows how to configure RTS for the access point abc:

```
Switch# ap name abc slot 3 rtsthreshold 54
```

# ap name static-ip

To configure lightweight access point static IP settings, use the **ap name static-ip** command. To disable the Cisco lightweight access point static IP address, use the **no** form of this command.

**ap name** *ap-name* **static-ip** {**domain** *domain-name*|**ip-address** *ip-address* **netmask** *netmask* **gateway** *gateway*|**nameserver** *ip-address*}
**ap name** *ap-name* **no static-ip**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the access point. |
| **domain** | Specifies the Cisco access point domain name. |
| *domain-name* | Domain to which a specific access point belongs. |
| **ip-address** | Specifies the Cisco access point static IP address. |
| *ip-address* | Cisco access point static IP address. |
| **netmask** | Specifies the Cisco access point static IP netmask. |
| *netmask* | Cisco access point static IP netmask. |
| **gateway** | Specifies the Cisco access point gateway. |
| *gateway* | IP address of the Cisco access point gateway. |
| **nameserver** | Specifies a DNS server so that a specific access point can discover the switch using DNS resolution. |
| *ip-address* | IP address of the DNS server. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    An access point cannot discover the switch using Domain Name System (DNS) resolution if a static IP address is configured for the access point unless you specify a DNS server and the domain to which the access point belongs.

This example shows how to configure an access point static IP address:

```
Switch# ap name AP2 static-ip ip-address 192.0.2.54 netmask 255.255.255.0 gateway 192.0.2.1
```

# ap name stats-timer

To set the time in seconds that the Cisco lightweight access point sends its DOT11 statistics to the Cisco switch, use the **ap name stats-timer** command.

**ap  name** *ap-name*  **stats-timer** *timer-value*

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| *timer-value* | Time in seconds from 0 to 65535. A zero value disables the timer. |

**Command Default**   0 (Disabled).

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   A value of 0 (zero) means that the Cisco lightweight access point does not send any DOT11 statistics. The acceptable range for the timer is from 0 to 65535 seconds, and the Cisco lightweight access point must be disabled to set this value.

This example shows how to set the stats timer to 600 seconds for access point AP2:

```
Switch# ap name AP2 stats-timer 600
```

# ap name syslog host

To configure a syslog server for a specific Cisco lightweight access point, use the **ap name syslog host** command.

**ap name** *ap-name* **syslog host** *syslog-host-ip-address*

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | *syslog-host-ip-address* | IP address of the syslog server. |

**Command Default**   255.255.255.255

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   By default, the syslog server IP address for each access point is 255.255.255.255, which indicates that it is not yet set. When the default value is used, the global access point syslog server IP address is pushed to the access point.

This example shows how to configure a syslog server:

```
Switch# ap name AP2 syslog host 192.0.2.54
```

**Related Topics**

# ap name syslog level

To configure the system logging level, use the **ap name syslog level** command.

**ap name** *ap-name* **syslog level** {**alert**|**critical**|**debug**|**emergency**|**errors**|**information**|**notification**|**warning**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **alert** | Specifies alert level system logging. |
| **critical** | Specifies critical level system logging. |
| **debug** | Specifies debug level system logging. |
| **emergency** | Specifies emergency level system logging. |
| **errors** | Specifies error level system logging. |
| **information** | Specifies information level system logging. |
| **notification** | Specifies notification level system logging. |
| **warning** | Specifies warning level system logging. |

**Command Default**　　None

**Command Modes**　　Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure alert level system logging:

Switch# **ap name AP2 syslog level alert**

# ap name tcp-adjust-mss

To enable or disable the TCP maximum segment size (MSS) on a particular access point, use the **ap name tcp-adjust-mss** command. To disable the TCP maximum segment size (MSS) on a particular access point, use the **no** form of this command.

**ap name** *ap-name* **tcp-adjust-mss size** *size*
**ap name** *ap-name* **no tcp-adjust-mss**

| **Syntax Description** | *ap-name* | Name of the access point. |
| --- | --- | --- |
| | *size* | Maximum segment size, from 536 to 1363 bytes. |

**Command Default** None

**Command Modes** Any command mode

| **Command History** | **Release** | **Modification** |
| --- | --- | --- |
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** When you enable this feature, the access point checks for TCP packets to and from wireless clients in its data path. If the MSS of these packets is greater than the value that you configured or greater than the default value for the Control and Provisioning of Wireless Access Points (CAPWAP) tunnel, the access point changes the MSS to the new configured value. If the MSS of these packets is greater than the value that you have configured or greater than the default value for the CAPWAP tunnel, the access point changes the MSS to the newly configured value.

This example shows how to enable the TCP MSS on access point Cisco_ap1:

```
Switch# ap name ciscoap tcp-adjust-mss size 1200
```

**Related Topics**

# ap name tftp-downgrade

To configure the settings used for downgrading a lightweight access point to an autonomous access point, use the **ap name tftp-downgrade** command.

**ap name** *ap-name* **tftp-downgrade** *tftp-server-ip* *filename*

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| *tftp-server-ip* | IP address of the TFTP server. |
| *filename* | Filename of the access point image file on the TFTP server. |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the settings for downgrading access point AP1:

```
Switch# ap name Ap01 tftp-downgrade 172.21.12.45 ap3g1-k9w7-tar.124-25d.JA.tar
```

# ap power injector

To configure the power injector state for all the Cisco lightweight access points that are joined to the switch, use the **ap power injector** command. To delete the power injector state for all access points, use the **no** form of this command.

**ap power injector** {**installed|override|switch-mac-address** *switch-MAC-addr*}
**no ap power injector**

**Syntax Description**

| | |
|---|---|
| **installed** | Detects the MAC address of the current switch port that has a power injector. |
| **override** | Overrides the safety checks and assumes a power injector is always installed. |
| **switch-mac-address** | Specifies the MAC address of the switch port with an installed power injector. |
| *switch-MAC-address* | Specifies the MAC address of the switch port with an installed power injector. |

**Command Default** None

**Command Modes** Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the power injector state for all the Cisco lightweight access points that are joined to the switch:

```
Switch(config)# ap power injector switch-mac-address aaaa.bbbb.cccc
```

# ap power pre-standard

To set the Cisco lightweight access points that are joined to the switch to be powered by a high-power Cisco switch, use the **ap power pre-standard** command. To disable the pre standard power for all access points, use the **no** form of this command.

**ap power pre-standard**
**no ap power pre-standard**

**Syntax Description**    This command has no keywords and arguments.

**Command Default**    Disabled

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to enable the inline power Cisco prestandard switch state for access point AP02:

```
Controller(config)# ap power pre-standard
```

# ap reporting-period

To configure the access point rogue/error reporting period, use the **ap reporting-period** command. To disable the access point rogue/error reporting period, use the **no** form of this command.

**ap reporting-period** *value*
**no ap reporting-period**

| | |
|---|---|
| **Syntax Description** | *value*  Time period in seconds from 10 to 120. |

**Command Default**  None

**Command Modes**  Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example show how to configure the access point rogue/error reporting:

```
Switch(config)# ap reporting-period 100
```

This example show how to disable the access point rogue/error reporting:

```
Switch(config)# no ap reporting-period 100
```

# ap reset-button

To configure the Reset button for all Cisco lightweight access points that are joined to the switch, use the **ap reset-button** command. To disable the Reset button for all access points, use the **no** form of this command.

**ap reset-button**
**no ap reset-button**

| | |
|---|---|
| **Syntax Description** | This command has no keywords and arguments. |

| | |
|---|---|
| **Command Default** | None |

| | |
|---|---|
| **Command Modes** | Global configuration |

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the Reset button for all access points that are joined to the controller:

```
Switch(config)# ap reset-button
```

# service-policy type control subscriber

To apply the global subscriber control policy, use the **service-policy type control subscriber** *<subscriber-policy-name>*command.

**service-policytypecontrolsubscriber***<subscriber-policy-name>*

| Syntax Description | **service-policy** | Instructs the access point to apply global subscriber control policy. |
| --- | --- | --- |
| | *<subscriber-policy-name>* | Name of the subscriber policy. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.3SE | This command was introduced. |

### Example

This example shows how to disable the global subscriber control policy.

```
Switchno service-policy type control subscriber
```

# ap static-ip

To configure Cisco lightweight access point static IP address settings, use the **ap static-ip** command. To disable access point static IP settings, use the **no** form of this command.

**ap static-ip** {**domain** *domain-name*|**name-server** *ip-address*}
**no ap static-ip** {**domain**|**name-server**}

| Syntax Description | | |
|---|---|---|
| | **domain** | Specifies the domain to which a specific access point or all access points belong. |
| | *domain-name* | Domain name. |
| | **name-server** | Specifies a DNS server so that a specific access point or all access points can discover the switch using DNS resolution. |
| | *ip-address* | DNS server IP address. |

**Command Default**   None

**Command Modes**   Global configuration

| **Command History** | **Release** | **Modification** |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   An access point cannot discover the switch using Domain Name System (DNS) resolution if a static IP address is configured for the access point, unless you specify a DNS server and the domain to which the access point belongs.

This example shows how to configure a static IP address for all access points:

```
Switch(config)# ap static-ip domain cisco.com
```

# ap syslog

To configure the system logging settings for all Cisco lightweight access points that are joined to the switch, use the **ap syslog** command.

**ap syslog** {**host** *ipaddress*|**level**{**alert**|**critical**|**debug**|**emergency**|**errors**|**information**|**notification**|**warning**}}

| | |
|---|---|
| **Syntax Description** | |

| **host** | Specifies a global syslog server for all access points that join the switch. |
|---|---|
| *ipaddress* | IP address of the syslog server. |
| **level** | Specifies the system logging level for all the access points joined to the switch. |
| **alert** | Specifies alert level system logging for all Cisco access points. |
| **critical** | Specifies critical level system logging for all Cisco access points. |
| **debug** | Specifies debug level system logging for all Cisco access points. |
| **emergency** | Specifies emergency level system logging for all Cisco access points. |
| **errors** | Specifies errors level system logging for all Cisco access points. |
| **information** | Specifies information level system logging for all Cisco access points. |
| **notification** | Specifies notification level system logging for all Cisco access points. |
| **warning** | Specifies warning level system logging for all Cisco access points. |

**Command Default**    None

**Command Modes**    Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**    By default, the global syslog server IP address for all access points is 255.255.255.255. Make sure that the access points can reach the subnet on which the syslog server resides before configuring the syslog server on the switch. If the access points cannot reach this subnet, the access points are unable to send out syslog messages.

This example shows how to configure a global syslog server for all access points:

```
Switch(config)# ap syslog host 172.21.34.45
```

# ap name no controller

To change the order of configured primary, secondary and tertiary wireless LAN controllers use the following commands.

**ap** **name***ap-name* **no controller primary**

**ap** **name***ap-name* **no controller secondary**

**ap** **name***ap-name* **no controller tertiary**

| Syntax Description | *ap- name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | **no controller primary** | Instructs the access point to unconfigure the primary controller. |
| | **no controller secondary** | Instructs the access point to unconfigure the secondary controller. |
| | **no controller tertiary** | Instructs the access point to unconfigure the tertiary controller. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Usage Guidelines**    If you have the primary, secondary, and tertiary wireless LAN controllers configured for an access point and you require swap the controller names and the corresponding IP addresses you can uncofigure the primary and configure the secondary controller.

**Example**

This example shows how to unconfigure the primary controller.

```
Switchap name <AP Name> no controller primary.
```

# ap tcp-adjust-mss size

To enable the TCP maximum segment size (MSS) on all Cisco lightweight access points, use the **ap tcp-adjust-mss size** command. To disable the TCP maximum segment size (MSS) on all Cisco lightweight access points **no** form of this command.

**ap tcp-adjust-mss size** *size*
**no ap tcp-adjust-mss**

| Syntax Description | *size* | Maximum segment size, from 536 to 1363 bytes. |
|---|---|---|

**Command Default**   None

**Command Modes**   Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   When you enable this feature, the access point checks for TCP packets to and from wireless clients in its data path. If the MSS of these packets is greater than the value that you configured or greater than the default value for the Control and Provisioning of Wireless Access Points (CAPWAP) tunnel, the access point changes the MSS to the new configured value.

This example shows how to enable the TCP MSS on all access points with a segment size of 1200:

```
Switch(config)# ap tcp-adjust-mss 1200
```

**Related Topics**

show ap name tcp-adjust-mss, on page 229

# ap tftp-downgrade

To configure the settings used for downgrading a lightweight access point to an autonomous access point, use the **ap tftp-downgrade** command. To disable the settings used for downgrading a lightweight access point to an autonomous access point, use the **no** form of this command.

**ap** **tftp-downgrade** *tftp-server-ip* *filename*
**no** **ap** **tftp-downgrade**

| Syntax Description | *tftp-server-ip* | IP address of the TFTP server. |
| --- | --- | --- |
| | *filename* | Filename of the access point image file on the TFTP server. |

**Command Default**  None

**Command Modes**  Global configuration

| Command History | Release | Modification |
| --- | --- | --- |
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to configure the settings for downgrading all access points:

```
Switch(config)# ap tftp-downgrade 172.21.23.45 ap3g1-k9w7-tar.124-25d.JA.tar
```

# config wireless wps rogue client mse

To configure a rogue MSE client, use **wirelesswps rogueclientmse**command.

To view the summary of the wireless client statistics, use **show wirelessclientclient-statisticssummary** command.

**wirelesswpsrogueclientmse**

**showwirelessclientclient-statisticssummary**

| Syntax Description | | |
|---|---|---|
| **rogueclient mse** | Instructs the access point to enable configuring a rogue MSE client. |
| **nowireless wps** | Instructs the access point to disable the configuring a rogue MSE client. |
| **client-statisticssummary** | Instructs to view the summary of the wireless client statistics. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

**Example**

This example shows how to configure a rogue MSE client.

Switch**wireless wps rogue client mse**

# clear ap name tsm dot11 all

To clear the traffic stream metrics (TSM) statistics for a particular access point or all the access points, use the **clear ap name tsm dot11 all** command.

**clear ap name** *ap-name* **tsm dot11** {**24ghz**|**5ghz**} **all**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
| --- | --- | --- |
| | **24ghz** | Specifies the 2.4 GHz band. |
| | **5ghz** | Specifies the 5 GHz band. |
| | **all** | Specifies all access points. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to clear the TSM statistics for an access point on the 2.4 GHz band:

```
Switch# clear ap name AP1 tsm dot11 24ghz all
```

# clear ap config

To clear (reset to the default values) a lightweight access point's configuration settings, use the **clear ap config** command.

**clear ap config** *ap-name* [{**eventlog**|**keep-ip-config**}]

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
|---|---|---|
| | **eventlog** | (Optional) Deletes the existing event log and creates an empty event log file for a specific access point or for all access points joined to the switch. |
| | **keep-ip-config** | (Optional) Specifies not to erase the static IP configuration of the Cisco access point. |

| Command Default | None |
|---|---|

| Command Modes | Any command mode |
|---|---|

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**   Entering this command does not clear the static IP address of the access point.

This example shows how to clear the access point's configuration settings for the access point named AP01:

```
Switch# clear ap config AP01
```

**Related Topics**

# clear ap eventlog-all

To delete the existing event log and create an empty event log file for all access points, use the **clear ap eventlog-all** command.

**clear  ap  eventlog-all**

| Syntax Description | This command has no keywords and arguments. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to delete the event log for all access points:

```
Switch# clear ap eventlog-all
```

# clear ap join statistics

To clear the join statistics for all access points or for a specific access point, use the **clear ap join statistics** command.

**clear ap join statistics**

**Syntax Description**    This command has no keywords and arguments.

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to clear the join statistics of all the access points:

```
Switch# clear ap join statistics
```

# clear ap mac-address

To clear the MAC address for the join statistics for a specific Cisco lightweight access point, use the **clear ap mac-address** command.

**clear ap mac-address** *mac* **join statistics**

| | |
|---|---|
| *mac* | Access point MAC address. |
| **join statistics** | Clears join statistics. |

**Syntax Description**

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to clear the join statistics of an access point:

```
Switch# clear ap mac-address aaaa.bbbb.cccc join statistics
```

# clear ap name wlan statistics

To clear WLAN statistics, use the **clear ap name wlan statistics** command.

**clear ap name** *ap-name* **wlan statistics**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to clear the WLAN configuration elements of the access point cisco_ap:

```
Switch# clear ap name cisco_ap wlan statistics
```

# debug ap mac-address

To enable debugging of access point on the mac-address, use the **debug ap mac-address** command.

**debug ap mac-address** *mac-address*
**no debug ap mac-address** *mac-address*

| | |
|---|---|
| **Syntax Description** | *mac-address*    Access point Ethernet MAC address or the MAC address of the 802.11 radio interface. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| 10.3Cisco IOS XE 3.3 SE | This command was introduced. |

This example shows how to enable debugging mac-address on an AP :

```
Switch# debug ap mac-address
ap mac-address debugging is on
```

This example shows how to disable debugging mac-address on an AP :

```
Switch# no debug ap mac-address
ap mac-address debugging is off
```

# show ap cac voice

To display the list of all access points with brief voice statistics, which include bandwidth used, maximum bandwidth available, and the call information, use the **show ap cac voice** command.

**show ap cac voice**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display voice CAC details that correspond to Cisco lightweight access points:

```
controller# show ap cac voice

1) AP Name: AP01
=============================

  Wireless Bandwidth (In MeanTime mt)

       Slot#  Radio        Calls  BW-Max  BW-Alloc  Bw-InUse (%age)
    ----------------------------------------------------------------
    1   0     802.11b/g    0      23437   0         0
    2   1     802.11a      0      23437   0         0

  Wired Bandwidth (in Kbps)

       Slot#  Wlan-ID  Wlan-Name          BW-Config   BW-Avail
    ----------------------------------------------------------------
    1   0     1        maria-open         0           0
    2   0     12       24                 0           0
    3   1     1        maria-open         0           0
    4   1     12       24                 0           0


2) AP Name: AP02
=============================

  Wireless Bandwidth (In MeanTime mt)

       Slot#  Radio        Calls  BW-Max  BW-Alloc  Bw-InUse (%age)
    ----------------------------------------------------------------
    1   0     802.11b/g    0      23437   0         0
    2   1     802.11a      0      23437   0         0

  Wired Bandwidth (in Kbps)

       Slot#  Wlan-ID  Wlan-Name          BW-Config   BW-Avail
    ----------------------------------------------------------------
```

```
1    0    1        maria-open              0              0
2    0    12       24                      0              0
3    1    1        maria-open              0              0
4    1    12       24                      0              0
```

# show ap capwap

To display the Control and Provisioning of Wireless Access Points (CAPWAP) configuration that is applied to all access points, use the **show ap capwap** command.

**show ap capwap** {**retransmit|timers|summary**}

**Syntax Description**

| | |
|---|---|
| **retransmit** | Displays the access point CAPWAP retransmit parameters. |
| **timers** | Displays the rogue access point entry timers. |
| **summary** | Displays the network configuration of the Cisco switch. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the access point CAPWAP retransmit parameters:

```
Controller# show ap capwap retransmit

Global control packet retransmit interval : 3
Global control packet retransmit count : 5

AP Name                    Retransmit Interval            Retransmit Count
-------------------------------------------------------------------------------
AP01                       3                              5

AP02                       3                              5

AP03                       3                              5

AP04                       3                              5

AP05                       3                              5

AP07                       3                              5

AP08                       3                              5

AP09                       3                              5

AP10                       3                              5

AP11                       3                              5

AP12                       3                              5
```

This example shows how to display the rogue access point entry timers:

```
Controller# show ap capwap timers

AP Discovery timer       : 10
AP Heart Beat timeout    : 30
Primary Discovery timer  : 120
Primed Join timeout      : 0
Fast Heartbeat           : Disabled
Fast Heartbeat timeout   : 1
```

This example shows how to display the the network configuration of the Cisco switch:

```
Controller# show ap capwap summary

AP Fallback                    : Enabled
AP Join Priority               : Disabled
AP Master                      : Disabled
Primary backup Controller Name   :
Primary backup Controller IP     : 0.0.0.0
Secondary backup Controller Name :
Secondary backup Controller IP   : 0.0.0.0
```

# show ap cdp

To display the Cisco Discovery Protocol (CDP) information for all Cisco lightweight access points that are joined to the switch, use the **show ap cdp** command.

**show ap cdp** [**neighbors** [**detail**]]

| Syntax Description | **neighbors** | (Optional) Displays neighbors using CDP. |
|---|---|---|
| | **detail** | (Optional) Displays details about a specific access point neighbor that is using CDP. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the CDP status of all access points:

```
Switch# show ap cdp
```

This example shows how to display details about all neighbors that are using CDP:

```
Switch# show ap cdp neighbors
```

**Related Topics**

# show ap config dot11

To display the detailed configuration of 802.11-58G radios on Cisco lightweight access points, use the **show ap config dot11** command.

**show ap config dot11 58ghz summary**

| Syntax Description | | |
|---|---|---|
| **58ghz** | Displays the 802.11-58G radios. |
| **summary** | Displays a summary of the radios on the access points. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the detailed configuration of 802.11a-58G radios on access points:

```
Switch# show ap config dot11 58ghz summary
```

# show ap config dot11 dual-band summary

To view a summary of configuration settings for dual band radios of Cisco APs, use the **show ap config dot11 dual-band summary** command.

**show ap config dot11 dual-band summary**

**Syntax Description**

| | |
|---|---|
| **dual-band** | Specifies the dual band radio. |
| **summary** | Displays a summary of configuration settings for dual band radios of Cisco APs. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

# show ap config fnf

To view Netflow input and output monitors for all Cisco APs, use the **show ap config fnf** command.

**show ap config fnf**

**Syntax Description**

| | |
|---|---|
| **fnf** | Netflow input and output monitors for all Cisco APs. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

# show ap config

To display configuration settings for all access points that join the switch, use the **show ap config** command.

**show ap config** {**ethernet|general|global**}

| Syntax Description | | |
|---|---|---|
| | **ethernet** | Displays ethernet VLAN tagging information for all Cisco APs. |
| | **general** | Displays common information for all Cisco APs. |
| | **global** | Displays global settings for all Cisco APs. |

**Command Default**     None

**Command Modes**     Any command mode

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display global syslog server settings:

```
Switch# show ap config global

AP global system logging host                  : 255.255.255.255
```

# show ap crash-file

To display the list of both crash and radio core dump files generated by lightweight access points, use the **show ap crash-file** command.

**show ap crash-file**

| **Syntax Description** | This command has no keywords and arguments. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the crash file generated by the access point:

```
Switch# show ap crash-file
```

**Related Topics**

# show ap data-plane

To display the data plane status, use the **show ap data-plane** command.

**show ap data-plane**

**Syntax Description**    This command has no keywords and arguments.

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example show how to display the data plane status for all access points:

Switch# **show ap data-plane**

# show ap dot11 l2roam

To display 802.11a or 802.11b/g Layer 2 client roaming information, use the **show ap dot11 l2roam** command.

**show ap dot11** {**24ghz|5ghz**} **l2roam** {**mac-address** *mac-address* **statistics|rf-param|statistics**}

| Syntax Description | | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **mac-address** *mac-address* **statistics** | Specifies the MAC address of a Cisco lightweight access point. |
| **rf-param** | Specifies the Layer 2 frequency parameters. |
| **statistics** | Specifies the Layer 2 client roaming statistics. |

**Command Default**　None

**Command Modes**　Any command mode

| Command History | Release | Modification |
|---|---|---|
| | Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display 802.11b Layer 2 client roaming information:

```
Switch# show ap dot11 24ghz l2roam rf-param

L2Roam 802.11bg RF Parameters
  Config Mode        : Default
  Minimum RSSI       : -85
  Roam Hysteresis    : 2
  Scan Threshold     : -72
  Transition time    : 5
```

# show ap dot11 cleanair air-quality

To display the air-quality summary information and air-quality worst information for the 802.11 networks, use the **show ap dot11 cleanair air-quality** command.

**show ap dot11** {**24ghz|5ghz**} **cleanair air-quality** {**summary|worst**}

**Syntax Description**

| | |
|---|---|
| **24ghz** | Displays the 2.4 GHz band. |
| **5ghz** | Displays the 5 GHz band. |
| **summary** | Displays a summary of 802.11 radio band air-quality information. |
| **worst** | Displays the worst air-quality information for 802.11 networks. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the worst air-quality information for the 5 GHz band:

```
Switch# show ap dot11 5ghz cleanair air-quality worst

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel Avg AQ Min AQ Interferers DFS
------------ ------- ------ ------ ----------- -----
CISCO_AP3500 36      95     70     0           40
```

This example shows how to display the worst air-quality information for the 2.4 GHz band:

```
Switch# show ap dot11 24ghz cleanair air-quality worst

AQ = Air Quality
DFS = Dynamic Frequency Selection
AP Name      Channel Avg AQ Min AQ Interferers DFS
------------ ------- ------ ------ ----------- -----
CISCO_AP3500 1       83     57     3           5
```

# show ap dot11 cleanair config

To display the CleanAir configuration for the 802.11 networks, use the **show ap dot11 cleanair config** command.

**show ap dot11 {24ghz|5ghz} cleanair config**

| Syntax Description | | |
| --- | --- | --- |
| | **24ghz** | Displays the 2.4 GHz band. |
| | **5ghz** | Displays the 5 GHz band. |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the CleanAir configuration for the 2.4 GHz band:

```
Switch# show ap dot11 24ghz cleanair config
Clean Air Solution.............................. : Disabled
Air Quality Settings:
    Air Quality Reporting....................... : Disabled
    Air Quality Reporting Period (min).......... : 15
    Air Quality Alarms.......................... : Enabled
    Air Quality Alarm Threshold................. : 10
Interference Device Settings:
    Interference Device Reporting............... : Enabled
        Bluetooth Link.......................... : Enabled
        Microwave Oven.......................... : Enabled
        802.11 FH............................... : Enabled
        Bluetooth Discovery..................... : Enabled
        TDD Transmitter......................... : Enabled
        Jammer.................................. : Enabled
        Continuous Transmitter.................. : Enabled
        DECT-like Phone......................... : Enabled
        Video Camera............................ : Enabled
        802.15.4................................ : Enabled
        WiFi Inverted........................... : Enabled
        WiFi Invalid Channel.................... : Enabled
        SuperAG................................. : Enabled
        Canopy.................................. : Enabled
        Microsoft Device........................ : Enabled
        WiMax Mobile............................ : Enabled
        WiMax Fixed............................. : Enabled
    Interference Device Types Triggering Alarms:
        Bluetooth Link.......................... : Disabled
        Microwave Oven.......................... : Disabled
        802.11 FH............................... : Disabled
        Bluetooth Discovery..................... : Disabled
        TDD Transmitter......................... : Disabled
        Jammer.................................. : Disabled
        Continuous Transmitter.................. : Disabled
        DECT-like Phone......................... : Disabled
```

```
            Video Camera............................. : Disabled
            802.15.4................................. : Disabled
            WiFi Inverted............................ : Enabled
            WiFi Invalid Channel..................... : Enabled
            SuperAG.................................. : Disabled
            Canopy................................... : Disabled
            Microsoft Device......................... : Disabled
            WiMax Mobile............................. : Disabled
            WiMax Fixed.............................. : Disabled
        Interference Device Alarms................... : Enabled
    Additional Clean Air Settings:
        CleanAir Event-driven RRM State.............. : Disabled
        CleanAir Driven RRM Sensitivity.............. : LOW
        CleanAir Persistent Devices state............ : Disabled
```

# show ap dot11 cleanair summary

To view CleanAir configurations for all 802.11a Cisco APs, use the **show ap dot11 cleanair summary** command.

**show ap dot11{24ghz|5ghz} cleanair summary**

| Syntax Description | | |
|---|---|---|
| **24ghz** | Specifies the 2.4-GHz band | |
| **5ghz** | Specifies the 5-GHz band | |
| **cleanair summary** | Summary of CleanAir configurations for all 802.11a Cisco APs | |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

# show ap dot11

To view 802.11a or 802.11b configuration information, use the **show ap dot11** command.

**show ap dot11**{**24ghz|5ghz**}
{**channel|coverage|group|load-info|logging|media-stream|monitor|network|profile|receiver|service-policy|summary|txpower|ccx global**}

**Syntax Description**

| | |
|---|---|
| **24ghz** | Specifies the 2.4 GHz band. |
| **5ghz** | Specifies the 5 GHz band. |
| **channel** | Displays the automatic channel assignment configuration and statistics. |
| **coverage** | Displays the configuration and statistics for coverage hole detection. |
| **group** | Displays 802.11a or 802.11b Cisco radio RF grouping. |
| **load-info** | Displays channel utilization and client count information for all Cisco APs. |
| **logging** | Displays 802.11a or 802.11b RF event and performance logging. |
| **media-stream** | Display 802.11a or 802.11b Media Resource Reservation Control configurations. |
| **monitor** | Displays the 802.11a or 802.11b default Cisco radio monitoring. |
| **network** | Displays the 802.11a or 802.11b network configuration. |
| **profile** | Displays the 802.11a or 802.11b lightweight access point performance profiles. |
| **receiver** | Displays the configuration and statistics of the 802.11a or 802.11b receiver. |
| **service-policy** | Displays the Quality of Service (QoS) service policies for 802.11a or 802.11b radio for all Cisco access points. |
| **summary** | Displays the 802.11a or 802.11b Cisco lightweight access point name, channel, and transmit level summary. |
| **txpower** | Displays the 802.11a or 802.11b automatic transmit power assignment. |
| **ccx global** | Displays 802.11a or 802.11b Cisco Client eXtensions (CCX) information for all Cisco access points that are joined to the switch. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |
| Cisco IOS XE 3.3SE | The **load-info** parameter was added. |

This example shows how to display the automatic channel assignment configuration and statistics:

```
Switch# show ap dot11 5ghz channel
Automatic Channel Assignment
  Channel Assignment Mode                 : AUTO
  Channel Update Interval                 : 12 Hours
  Anchor time (Hour of the day)           : 20
  Channel Update Contribution             : SNI.
  Channel Assignment Leader               : web (9.9.9.2)
  Last Run                                : 13105 seconds ago
  DCA Sensitivity Level                   : MEDIUM (15 dB)
  DCA 802.11n Channel Width               : 40 Mhz
  Channel Energy Levels
     Minimum                              : unknown
     Average                              : unknown
     Maximum                              : unknown
  Channel Dwell Times
     Minimum                              : unknown
     Average                              : unknown
     Maximum                              : unknown
  802.11a 5 GHz Auto-RF Channel List
  Allowed Channel List                    : 36,40,44,48,52,56,60,64,149,153,1
57,161
  Unused Channel List                     : 100,104,108,112,116,132,136,140,1
65
  802.11a 4.9 GHz Auto-RF Channel List
  Allowed Channel List                    :
  Unused Channel List                     : 1,2,3,4,5,6,7,8,9,10,11,12,13,14,
15,16,17,18,19,20,21,22,23,24,25,26
  DCA Outdoor AP option                   : Disabled
```

This example shows how to display the statistics for coverage hole detection:

```
Switch# show ap dot11 5ghz coverage
Coverage Hole Detection
  802.11a Coverage Hole Detection Mode        : Enabled
  802.11a Coverage Voice Packet Count         : 100 packet(s)
  802.11a Coverage Voice Packet Percentage    : 50 %
  802.11a Coverage Voice RSSI Threshold       : -80dBm
  802.11a Coverage Data Packet Count          : 50 packet(s)
  802.11a Coverage Data Packet Percentage     : 50 %
  802.11a Coverage Data RSSI Threshold        : -80dBm
  802.11a Global coverage exception level     : 25
  802.11a Global client minimum exception level   : 3 clients
```

This example shows how to display Cisco radio RF group settings:

```
Switch# show ap dot11 5ghz group
Radio RF Grouping

  802.11a Group Mode              : STATIC
```

```
    802.11a Group Update Interval     : 600 seconds
    802.11a Group Leader              : web (10.10.10.1)
    802.11a Group Member              : web(10.10.10.1)
                                        nb1(172.13.21.45) (*Unreachable)
    802.11a Last Run                  : 438 seconds ago


    Mobility Agents RF membership information
    -------------------------------------------------------------
    No of 802.11a MA RF-members : 0
```

This example shows how to display 802.11a RF event and performance logging:

```
Switch# show ap dot11 5ghz logging
RF Event and Performance Logging

  Channel Update Logging          : Off
  Coverage Profile Logging        : Off
  Foreign Profile Logging         : Off
  Load Profile Logging            : Off
  Noise Profile Logging           : Off
  Performance Profile Logging     : Off
  TxPower Update Logging          : Off
```

This example shows how to display the 802.11a media stream configuration:

```
Switch# show ap dot11 5ghz media-stream
Multicast-direct              : Disabled
Best Effort                   : Disabled
Video Re-Direct               : Disabled
Max Allowed Streams Per Radio    : Auto
Max Allowed Streams Per Client   : Auto
Max Video Bandwidth           : 0
Max Voice Bandwidth           : 75
Max Media Bandwidth           : 85
Min PHY Rate (Kbps)           : 6000
Max Retry Percentage          : 80
```

This example shows how to display the radio monitoring for the 802.11b network:

```
Switch# show ap dot11 5ghz monitor
Default 802.11a AP monitoring

  802.11a Monitor Mode                         : Enabled
  802.11a Monitor Mode for Mesh AP Backhaul    : disabled
  802.11a Monitor Channels                     : Country channels
  802.11a RRM Neighbor Discover Type           : Transparent
  802.11a AP Coverage Interval                 : 180 seconds
  802.11a AP Load Interval                     : 60 seconds
  802.11a AP Noise Interval                    : 180 seconds
  802.11a AP Signal Strength Interval          : 60 seconds
```

This example shows how to display the global configuration and statistics of an 802.11a profile:

```
Switch# show ap dot11 5ghz profile
Default 802.11a AP performance profiles
802.11a Global Interference threshold.............. 10%
802.11a Global noise threshold..................... -70 dBm
802.11a Global RF utilization threshold............ 80%
802.11a Global throughput threshold................ 1000000 bps
802.11a Global clients threshold................... 12 clients
802.11a Global coverage threshold.................. 12 dB
```

```
802.11a Global coverage exception level............ 80%
802.11a Global client minimum exception lev........ 3 clients
```

This example shows how to display the network configuration of an 802.11a profile:

```
Switch# show ap dot11 5ghz network
802.11a Network : Enabled
11nSupport : Enabled
  802.11a Low Band : Enabled
  802.11a Mid Band : Enabled
  802.11a High Band : Enabled

802.11a Operational Rates
  802.11a 6M : Mandatory
  802.11a 9M : Supported
  802.11a 12M : Mandatory
  802.11a 18M : Supported
  802.11a 24M : Mandatory
  802.11a 36M : Supported
  802.11a 48M : Supported
  802.11a 54M : Supported
802.11n MCS Settings:
  MCS 0 : Supported
  MCS 1 : Supported
  MCS 2 : Supported
  MCS 3 : Supported
  MCS 4 : Supported
  MCS 5 : Supported
  MCS 6 : Supported
  MCS 7 : Supported
  MCS 8 : Supported
  MCS 9 : Supported
  MCS 10 : Supported
  MCS 11 : Supported
  MCS 12 : Supported
  MCS 13 : Supported
  MCS 14 : Supported
  MCS 15 : Supported
  MCS 16 : Supported
  MCS 17 : Supported
  MCS 18 : Supported
  MCS 19 : Supported
  MCS 20 : Supported
  MCS 21 : Supported
  MCS 22 : Supported
  MCS 23 : Supported
802.11n Status:
  A-MPDU Tx:
    Priority 0 : Enabled
    Priority 1 : Disabled
    Priority 2 : Disabled
    Priority 3 : Disabled
    Priority 4 : Enabled
    Priority 5 : Enabled
    Priority 6 : Disabled
    Priority 7 : Disabled
  A-MSDU Tx:
    Priority 0 : Enabled
    Priority 1 : Enabled
    Priority 2 : Enabled
    Priority 3 : Enabled
    Priority 4 : Enabled
    Priority 5 : Enabled
    Priority 6 : Disabled
```

```
      Priority 7 : Disabled
   Guard Interval : Any
   Rifs Rx : Enabled
Beacon Interval : 100
CF Pollable mandatory : Disabled
CF Poll Request Mandatory : Disabled
CFP Period : 4
CFP Maximum Duration : 60
Default Channel : 36
Default Tx Power Level : 1
DTPC Status : Enabled
Fragmentation Threshold : 2346
Pico-Cell Status : Disabled
Pico-Cell-V2 Status : Disabled
TI Threshold : 0
Legacy Tx Beamforming setting : Disabled
Traffic Stream Metrics Status : Disabled
Expedited BW Request Status : Disabled
EDCA profile type check : default-wmm
Call Admision Control (CAC) configuration
Voice AC
   Voice AC - Admission control (ACM) : Disabled
   Voice Stream-Size : 84000
   Voice Max-Streams : 2
   Voice Max RF Bandwidth : 75
   Voice Reserved Roaming Bandwidth : 6
   Voice Load-Based CAC mode : Enabled
   Voice tspec inactivity timeout : Enabled
CAC SIP-Voice configuration
   SIP based CAC : Disabled
   SIP call bandwidth : 64
   SIP call bandwith sample-size : 20
Video AC
   Video AC - Admission control (ACM) : Disabled
   Video max RF bandwidth : Infinite
   Video reserved roaming bandwidth : 0
```

This example shows how to display the global configuration and statistics of an 802.11a profile:

```
Switch# show ap dot11 5ghz receiver
Default 802.11a AP performance profiles
802.11a Global Interference threshold.............. 10%
802.11a Global noise threshold..................... -70 dBm
802.11a Global RF utilization threshold............ 80%
802.11a Global throughput threshold................ 1000000 bps
802.11a Global clients threshold................... 12 clients
802.11a Global coverage threshold.................. 12 dB
802.11a Global coverage exception level............ 80%
802.11a Global client minimum exception lev........ 3 clients
```

This example shows how to display the global configuration and statistics of an 802.11a profile:

```
Switch# show ap dot11 5ghz service-policy
```

This example shows how to display a summary of the 802.11b access point settings:

```
Switch# show ap dot11 5ghz summary
AP Name MAC Address      Admin State Operation State Channel TxPower
------- ---------------- ----------- --------------- ------- -------
CJ-1240 00:21:1b:ea:36:60 ENABLED     UP              161     1( )
CJ-1130 00:1f:ca:cf:b6:60 ENABLED     UP              56*     1(*)
```

This example shows how to display the configuration and statistics of the 802.11a transmit power cost:

```
Switch# show ap dot11 5ghz txpower
Automatic Transmit Power Assignment

Transmit Power Assignment Mode          : AUTO
Transmit Power Update Interval          : 600 seconds
Transmit Power Threshold                : -70 dBm
Transmit Power Neighbor Count           : 3 APs
Min Transmit Power                      : -10 dBm
Max Transmit Power                      : 30 dBm
Transmit Power Update Contribution      : SNI.
Transmit Power Assignment Leader        : web (10.10.10.1)
Last Run                                : 437 seconds ago
```

This example shows how to display the configuration and statistics of the 802.11a transmit power cost:

```
Switch# show ap dot11 5ghz ccx global
 802.11a Client Beacon Measurements:
      disabled
```

### Related Topics

ap dot11 rrm channel dca, on page 52

# show ap env summary

To show ap environment summary, use the **show ap env summary** command.

There is no keyword or argument.

**Command Default**    None

**Command Modes**    Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to show ap environment summary:

```
Switch#show ap env summary
```

# show ap ethernet statistics

To display Ethernet statistics for all Cisco lightweight access points, use the **show ap ethernet statistics** command.

**show ap ethernet statistics**

This command has no keywords and arguments.

**Command Default**  None

**Command Modes**  User EXEC.

Privileged EXEC.

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display Ethernet statistics for all access points:

```
Switch# show ap ethernet statistics
```

# show ap gps-location summary

To show GPS location summary of all connected Cisco APs, use the **show ap gps-location summary** command. There is no keyword or argument.

**Command Default**     None

**Command Modes**     Privileged EXEC

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to show GPS location summary of all connected Cisco APs:

```
Switch# show ap gps-location summary
```

# show ap groups

To display information about all access point groups that are defined in the system, use the **show ap groups** command.

**show ap groups**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display information about all access point groups:

```
Switch# show ap groups
```

# show ap groups extended

To view information about all AP groups defined in the system in detail, use the **show ap groups extended** command.

**show ap groups extended**

| | |
|---|---|
| **Syntax Description** | **extended**    Displays information about all AP groups defined in the system in detail. |

**Command Default**    None

**Command Modes**    Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.3SE | This command was introduced. |

# show ap image

To display the images present on Cisco lightweight access points, use the **show ap image** command.

**show ap image**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display images on the access points:

```
Switch# show ap image
```

# show ap is-supported

To see if an AP model is supported or not, use the **show ap is-supported** command.

**show ap is-supported** *model-part-number*

**Syntax Description**

| | |
|---|---|
| *model-part-number* | Part number of the AP model. For example, AIR-LAP1142N-N-K9. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7.0E | This command was introduced. |

This example shows how to check if an AP model is supported or not:

```
Switch# show ap is-supported AIR-LAP1142N-N-K9

AP Support: Yes
```

# show ap join stats summary

To display the last join error detail for a specific access point, use the **show ap join stats summary** command.

**show ap join stats summary**

| | |
|---|---|
| **Syntax Description** | This command has no keywords and arguments. |

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**

To obtain the MAC address of the 802.11 radio interface, enter the **show interface** command on the access point.

This example shows how to display specific join information for an access point:

```
Switch# show ap join stats summary
Number of APs : 1

Base MAC        Ethernet MAC    AP Name              IP Address       Status

--------------- --------------- -------------------- ---------------- -------------
-
c8f9.f91a.aa80  0000.0000.0000  N A                  0.0.0.0          Not Joined
```

# show ap link-encryption

To display the link encryption status, use the **show ap link-encryption** command.

**show  ap  link-encryption**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example show how to display the link-encryption status:

```
Switch# show ap link-encryption
```

# show ap mac-address

To display join-related statistics collected and last join error details for access points, use the **show ap mac-address** command.

**show ap mac-address** *mac-address* **join stats** {**detailed|summary**}

**Syntax Description**

| | |
|---|---|
| *mac-address* | Access point Ethernet MAC address or the MAC address of the 802.11 radio interface. |
| **join stats** | Displays join information and statistics for Cisco access points. |
| **detailed** | Displays all join-related statistics collected. |
| **summary** | Displays the last join error detail. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display join information for a specific access point that is trying to join the switch:

```
Switch# show ap mac-address d0c2.8267.8b00 join stats detailed

Discovery phase statistics
  Discovery requests received                        : 6
  Successful discovery responses sent                : 6
  Unsuccessful discovery request processing          : 0
  Reason for last unsuccessful discovery attempt     : Not applicable
  Time at last successful discovery attempt          : Nov 20 17:25:10.841
  Time at last unsuccessful discovery attempt        : Not applicable

Join phase statistics
  Join requests received                             : 3
  Successful join responses sent                     : 3
  Unsuccessful join request processing               : 0
  Reason for last unsuccessful join attempt          : Not applicable
  Time at last successful join attempt               : Nov 20 17:25:20.998
  Time at last unsuccessful join attempt             : Not applicable

Configuration phase statistics
  Configuration requests received                    : 8
  Successful configuration responses sent            : 3
  Unsuccessful configuration request processing      : 0
  Reason for last unsuccessful configuration attempt : Not applicable
  Time at last successful configuration attempt      : Nov 20 17:25:21.177
  Time at last unsuccessful configuration attempt    : Not applicable

Last AP message decryption failure details
  Reason for last message decryption failure         : Not applicable

Last AP disconnect details
```

```
  Reason for last AP connection failure                      : Number of message retransmission
 to the AP has reached maximum

Last join error summary
  Type of error that occurred last                           : AP got or has been disconnected

  Reason for error that occurred last                        : Number of message retransmission
 to the AP has reached maximum
  Time at which the last join error occurred            : Nov 20 17:22:36.438
```

This example shows how to display specific join information for an access point:

```
Switch# show ap mac-address d0c2.8267.8b00 join stats detailed

Is the AP currently connected to controller.......................... No
Time at which the AP joined this controller last time................ Aug 21 12:50:36:061
Type of error that occurred last.................................... Lwapp join request
rejected
Reason for error that occurred last................................. RADIUS authorization
is pending for the AP
Time at which the last join error occurred.......................... Aug 21 12:50:34:374
```

# show ap monitor-mode summary

To display the current channel-optimized monitor mode settings, use the **show ap monitor-mode summary** command.

**show ap monitor-mode summary**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display current channel-optimized monitor mode settings:

```
Switch# show ap monitor-mode summary

AP Name Ethernet MAC      Status   Scanning Channel List
------- -------------     -------- -------- ----------------
AP_004  xx:xx:xx:xx:xx:xx Tracking 1,6,11,  4
```

# show ap name auto-rf

To display the auto-RF settings for a Cisco lightweight access point, use the **show ap name auto-rf** command.

**show ap name** *ap-name* **auto-rf dot11** {**24ghz**|**5ghz**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **24ghz** | Displays the 2.4 GHz band. |
| **5ghz** | Displays the 5 GHz band. |

**Command Default** None

**Command Modes** Privileged EXEC.

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display auto-RF information for an access point:

```
Switch# show ap name AP01 auto-rf dot11 24ghz

Number of Slots                                    : 2
AP Name                                            : TSIM_AP-1
MAC Address                                        : 0000.2000.02f0
Slot ID                                            : 0
Radio Type                                         : 802.11b/g
Subband Type                                       : All

Noise Information
  Noise Profile                                    : Failed
  Channel   1                                      :    24 dBm
  Channel   2                                      :    48 dBm
  Channel   3                                      :    72 dBm
  Channel   4                                      :    96 dBm
  Channel   5                                      :   120 dBm
  Channel   6                                      :  -112 dBm
  Channel   7                                      :   -88 dBm
  Channel   8                                      :   -64 dBm
  Channel   9                                      :   -40 dBm
  Channel  10                                      :   -16 dBm
  Channel  11                                      :     8 dBm

Interference Information
  Interference Profile                             : Passed
  Channel   1                                      :  -128 dBm @  0% busy
  Channel   2                                      :   -71 dBm @  1% busy
  Channel   3                                      :   -72 dBm @  1% busy
  Channel   4                                      :   -73 dBm @  2% busy
  Channel   5                                      :   -74 dBm @  3% busy
  Channel   6                                      :   -75 dBm @  4% busy
  Channel   7                                      :   -76 dBm @  5% busy
  Channel   8                                      :   -77 dBm @  5% busy
  Channel   9                                      :   -78 dBm @  6% busy
```

```
        Channel  10                                       :  -79 dBm @  7% busy
        Channel  11                                       :  -80 dBm @  8% busy

    Rogue Histogram (20/40_ABOVE/40_BELOW)
        Channel  36                                       : 27/ 4/ 0
        Channel  40                                       : 13/ 0/ 0
        Channel  44                                       :  5/ 0/ 0
        Channel  48                                       :  6/ 0/ 1
        Channel  52                                       :  4/ 0/ 0
        Channel  56                                       :  5/ 0/ 0
        Channel  60                                       :  1/ 3/ 0
        Channel  64                                       :  3/ 0/ 0
        Channel 100                                       :  0/ 0/ 0
        Channel 104                                       :  0/ 0/ 0
        Channel 108                                       :  0/ 1/ 0

    Load Information
      Load Profile                                        : Passed
      Receive Utilization                                 : 10%
      Transmit Utilization                                : 20%
      Channel Utilization                                 : 50%
      Attached Clients                                    : 0 clients

    Coverage Information
      Coverage Profile                                    : Passed
      Failed Clients                                      : 0 clients

    Client Signal Strengths
      RSSI -100 dBm                                       : 0 clients
      RSSI  -92 dBm                                       : 0 clients
      RSSI  -84 dBm                                       : 0 clients
      RSSI  -76 dBm                                       : 0 clients
      RSSI  -68 dBm                                       : 0 clients
      RSSI  -60 dBm                                       : 0 clients
      RSSI  -52 dBm                                       : 0 clients

    Client Signal to Noise Ratios
      SNR    0 dB                                         : 0 clients
      SNR    5 dB                                         : 0 clients
      SNR   10 dB                                         : 0 clients
      SNR   15 dB                                         : 0 clients
      SNR   20 dB                                         : 0 clients
      SNR   25 dB                                         : 0 clients
      SNR   30 dB                                         : 0 clients
      SNR   35 dB                                         : 0 clients
      SNR   40 dB                                         : 0 clients
      SNR   45 dB                                         : 0 clients

    Nearby APs
      AP 0000.2000.0300 slot 0                            : -68 dBm on  11 (10.10.10.1)
      AP 0000.2000.0400 slot 0                            : -68 dBm on  11 (10.10.10.1)
      AP 0000.2000.0600 slot 0                            : -68 dBm on  11 (10.10.10.1)

    Radar Information

    Channel Assignment Information
      Current Channel Average Energy                      : 0 dBm
      Previous Channel Average Energy                     : 0 dBm
      Channel Change Count                                : 0
      Last Channel Change Time                            : Wed Oct 17 08:13:36 2012
      Recommended Best Channel                            : 11

    RF Parameter Recommendations
      Power Level                                         : 1
```

```
RTS/CTS Threshold                              : 2347
Fragmentation Threshold                        : 2346
Antenna Pattern                                : 0

Persistent Interference Devices
```

# show ap name bhmode

To display Cisco bridge backhaul mode, use the **show ap name bhmode** command.

**show ap name** *ap-name* **bhmode**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display Cisco bridge backhaul mode of an access point:

```
Switch# show ap name TSIM_AP-1 bhmode
```

# show ap name bhrate

To display the Cisco bridge backhaul rate, use the **show ap name bhrate** command.

**show ap name** *ap-name* **bhrate**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the Cisco bridge backhaul rate for an access point:

```
Switch# show ap name AP01 bhrate
```

# show ap name cac voice

To display voice call admission control details for a specific Cisco lightweight access point, use the **show ap name cac voice** command.

**show ap name** *ap-name* **cac voice**

| | |
|---|---|
| **Syntax Description** | *ap-name*   Name of the Cisco lightweight access point. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display voice call admission control details for an access point:

```
Switch# show ap name AP01 cac voice
1) AP Name: AP01
==============================

 Wireless Bandwidth (In MeanTime mt)

      Slot#  Radio         Calls  BW-Max  BW-Alloc  Bw-InUse (%age)
     ----------------------------------------------------------------
1    0      802.11b/g     0      23437   0         0
2    1      802.11a       0      23437   0         0

 Wired Bandwidth (in Kbps)

      Slot#  Wlan-ID  Wlan-Name          BW-Config  BW-Avail
     ----------------------------------------------------------------
1    0      1        maria-open         0          0
2    0      12       24                 0          0
3    1      1        maria-open         0          0
4    1      12       24                 0          0
```

# show ap name config fnf

To view the Netflow input and output monitors for a Cisco AP, use the **show ap name config fnf** command.

**show ap name** *ap-name* **config fnf**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point |
| **fnf** | Netflow input and output monitors for a Cisco AP |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

# show ap name dot11 call-control

To display call control information and the metrics for successful calls, use the **show ap name dot11 call-control** command.

**show ap name** *ap-name* **dot11** {**24ghz|5ghz**} **call-control** {**call-info|metrics**}

| Syntax Description | | |
|---|---|---|
| | *ap-name* | Name of the Cisco lightweight access point |
| | **24ghz** | Displays the 2.4 GHz band. |
| | **5ghz** | Displays the 5 GHz band. |
| | **call-info** | Displays call information. |
| | **metrics** | Displays call metrics. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display metrics for successful calls for an access point:

```
Switch# show ap name AP01 dot11 24ghz call-control metrics

Slot#   Call Count      Call Duration
--------------------------------
0       0               0
```

# show ap name cable-modem

To show AP CAPWAP CCX on a specific AP, use the **show ap name cable-modem**command.

**show ap name** *ap-name***cable-modem**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the specific AP. |

**Command Default**     None

**Command Modes**     Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to show AP CAPWAP CCX on AP1:

```
Switch# show ap name ap1 cable-modem
```

# show ap name capwap retransmit

To display Control and Provisioning of Wireless Access Points (CAPWAP) retransmit settings, use the **show ap name capwap retransmit** command.

**show ap name** *ap-name* **capwap retransmit**

| | |
|---|---|
| **Syntax Description** | *ap-name*   Name of the Cisco lightweight access point. |

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display CAPWAP retransmit settings of an access point:

```
Switch# show ap name AP01 capwap retransmit

AP Name   Retransmit Interval Retransmit Count
--------  ------------------- ----------------
AP01      3                   5
```

# show ap name ccx rm

To display an access point's Cisco Client eXtensions (CCX) radio management status information, use the **show ap name ccx rm** command.

**show ap name** *ap-name* **ccx rm status**

**Syntax Description**

| *ap-name* | Name of the Cisco lightweight access point. |
|---|---|

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display CCX radio management information for an access point:

```
Switch# show ap name AP01 ccx rm status

802.11b/g Radio
  Beacon Request                          : Disabled
  Channel Load Request                    : Disabled
  Frame Request                           : Disabled
  Noise Histogram Request                 : Disabled
  Path Loss Request                       : Disabled
  Interval                                : 60
  Iteration                               : 0

802.11a Radio
  Beacon Request                          : Disabled
  Channel Load Request                    : Disabled
  Frame Request                           : Disabled
  Noise Histogram Request                 : Disabled
  Path Loss Request                       : Disabled
  Interval                                : 60
  Iteration                               : 0
```

# show ap name cdp

To display the Cisco Discovery Protocol (CDP) information for an access point, use the **show ap name cdp** command.

**show ap name** *ap-name* **cdp** [**neighbors** [**detail**]]

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
| --- | --- | --- |
| | **neighbors** | (Optional) Displays neighbors that are using CDP. |
| | **detail** | (Optional) Displays details about a specific access point neighbor that is using CDP. |

**Command Default**     None

**Command Modes**     Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display CDP information for an access point:

```
Switch# show ap name AP01 cdp neighbors detail
```

# show ap name channel

To display the available channels for a specific mesh access point, use the **show ap name channel** command.

**show  ap  name** *ap-name* **channel**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the available channels for a particular access point:

```
Switch# show ap name AP01 channel

Slot ID                                    : 0
Allowed Channel List                       : 1, 2, 3, 4, 5, 6, 7, 8, 9
                                             10, 11
Slot ID                                    : 1
Allowed Channel List                       : 36, 40, 44, 48, 52, 56, 60, 64, 100
                                             104, 108, 112, 116, 132, 136, 140, 149,
 153
                                             157, 161
```

# show ap name config

To display common information and Ethernet VLAN tagging information for a specific Cisco lightweight access point, use the **show ap name config** command.

**show ap name** *ap-name* **config** {**ethernet**|**general**}

Syntax Description

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **ethernet** | Displays Ethernet tagging configuration information for an access point. |
| **general** | Displays common information for an access point. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display Ethernet tagging information for an access point:

```
Switch# show ap name AP01 config ethernet

VLAN Tagging Information for AP01
```

This example shows how to display common information for an access point:

```
Switch# show ap name AP01 config general

Cisco AP Name                             : AP01
Cisco AP Identifier                       : 5
Country Code                              : US  - United States
Regulatory Domain Allowed by Country      : 802.11bg:-A    802.11a:-A
AP Country Code                           : US  - United States
AP Regulatory Domain                      : Unconfigured
Switch Port Number                        : Te1/0/1
MAC Address                               : 0000.2000.02f0
IP Address Configuration                  : Static IP assigned
IP Address                                : 10.10.10.12
IP Netmask                                : 255.255.0.0
Gateway IP Address                        : 10.10.10.1
Fallback IP Address Being Used            : 10.10.10.12
Domain                                    : Cisco
Name Server                               : 0.0.0.0
CAPWAP Path MTU                           : 1485
Telnet State                              : Enabled
SSH State                                 : Disabled
Cisco AP Location                         : sanjose
Cisco AP Group Name                       : default-group
Primary Cisco Controller Name             : CAPWAP Controller
Primary Cisco Controller IP Address       : 10.10.10.1
Secondary Cisco Controller Name           :
Secondary Cisco Controller IP Address     : Not Configured
```

```
Tertiary Cisco Controller Name               :
Tertiary Cisco Controller IP Address         : Not Configured
Administrative State                         : Enabled
Operation State                              : Registered
AP Mode                                      : Local
AP Submode                                   : Not Configured
Remote AP Debug                              : Disabled
Logging Trap Severity Level                  : informational
Software Version                             : 7.4.0.5
Boot Version                                 : 7.4.0.5
Stats Reporting Period                       : 180
LED State                                    : Enabled
PoE Pre-Standard Switch                      : Disabled
PoE Power Injector MAC Address               : Disabled
Power Type/Mode                              : Power Injector/Normal Mode
Number of Slots                              : 2
AP Model                                     : 1140AG
AP Image                                     : C1140-K9W8-M
IOS Version                                  :
Reset Button                                 :
AP Serial Number                             : SIM1140K001
AP Certificate Type                          : Manufacture Installed
Management Frame Protection Validation       : Disabled
AP User Mode                                 : Customized
AP User Name                                 : cisco
AP 802.1X User Mode                          : Not Configured
AP 802.1X User Name                          : Not Configured
Cisco AP System Logging Host                 : 255.255.255.255
AP Up Time                                   : 15 days 16 hours 19 minutes 57
 seconds
AP CAPWAP Up Time                            : 4 minutes 56 seconds
Join Date and Time                           : 10/18/2012 04:48:56
Join Taken Time                              : 15 days 16 hours 15 minutes 0
seconds
Join Priority                                : 1
Ethernet Port Duplex                         : Auto
Ethernet Port Speed                          : Auto
AP Link Latency                              : Disabled
Rogue Detection                              : Disabled
AP TCP MSS Adjust                            : Disabled
AP TCP MSS Size                              : 6146
```

# show ap name config dot11

To display 802.11 configuration information that corresponds to specific Cisco lightweight access points, use the **show ap name config dot11** command.

**show ap name** *ap-name* **config dot11** {**24ghz|49ghz|58ghz|5hgz|dual-band**}

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
| --- | --- | --- |
| | **24ghz** | Displays the 2.4 GHz band. |
| | **49ghz** | Displays 802.11-4.9G network settings. |
| | **58ghz** | Displays 802.11-5.8G network settings. |
| | **5hgz** | Displays the 5 GHz band settings. |
| | **dual-band** | Displays the dual band radio settings. |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |
| Cisco IOS XE 3.3SE | The **dual-band** parameter was added. |

This example shows how to display 802.11b configuration information that corresponds to a specific Cisco lightweight access point:

```
Switch# show ap name AP01 config dot11 24ghz

Cisco AP Identifier                            : 5
Cisco AP Name                                  : AP01
Country Code                                   : US  - United States
Regulatory Domain Allowed by Country           : 802.11bg:-A    802.11a:-A
AP Country Code                                : US  - United States
AP Regulatory Domain                           : -A
Switch Port Number                             : Te1/0/1
MAC Address                                    : 0000.2000.02f0
IP Address Configuration                       : Static IP assigned
IP Address                                     : 10.10.10.12
IP Netmask                                     : 255.255.0.0
Gateway IP Address                             : 10.10.10.1
Fallback IP Address Being Used                 : 10.10.10.12
Domain                                         : Cisco
Name Server                                    : 0.0.0.0
CAPWAP Path MTU                                : 1485
Telnet State                                   : Enabled
SSH State                                      : Disabled
Cisco AP Location                              : sanjose
Cisco AP Group Name                            : default-group
Administrative State                           : Enabled
```

```
Operation State                                   : Registered
AP Mode                                           : Local
AP Submode                                        : Not Configured
Remote AP Debug                                   : Disabled
Logging Trap Severity Level                       : informational
Software Version                                  : 7.4.0.5
Boot Version                                      : 7.4.0.5
Mini IOS Version                                  : 3.0.51.0
Stats Reporting Period                            : 180
LED State                                         : Enabled
PoE Pre-Standard Switch                           : Disabled
PoE Power Injector MAC Address                    : Disabled
Power Type/Mode                                   : Power Injector/Normal Mode
Number of Slots                                   : 2
AP Model                                          : 1140AG
AP Image                                          : C1140-K9W8-M
IOS Version                                       :
Reset Button                                      :
AP Serial Number                                  : SIM1140K001
AP Certificate Type                               : Manufacture Installed
Management Frame Protection Validation            : Disabled
AP User Mode                                      : Customized
AP User Name                                      : cisco
AP 802.1X User Mode                               : Not Configured
AP 802.1X User Name                               : Not Configured
Cisco AP System Logging Host                      : 255.255.255.255
AP Up Time                                        : 15 days 17 hours 9 minutes 41
seconds
AP CAPWAP Up Time                                 : 54 minutes 40 seconds
Join Date and Time                                : 10/18/2012 04:48:56
Join Taken Time                                   : 15 days 16 hours 15 minutes 0
seconds

Attributes for Slot 0
  Radio Type                                      : 802.11n - 2.4 GHz
  Administrative State                            : Enabled
  Operation State                                 : Up
  Cell ID                                         : 0

  Station Configuration
    Configuration                                 : Automatic
    Number of WLANs                               : 1
    Medium Occupancy Limit                        : 100
    CFP Period                                    : 4
    CFP Maximum Duration                          : 60
    BSSID                                         : 000020000200

    Operation Rate Set
       1000 Kbps                                  : MANDATORY
       2000 Kbps                                  : MANDATORY
       5500 Kbps                                  : MANDATORY
      11000 Kbps                                  : MANDATORY
       6000 Kbps                                  : SUPPORTED
       9000 Kbps                                  : SUPPORTED
      12000 Kbps                                  : SUPPORTED
      18000 Kbps                                  : SUPPORTED
      24000 Kbps                                  : SUPPORTED
      36000 Kbps                                  : SUPPORTED
      48000 Kbps                                  : SUPPORTED
      54000 Kbps                                  : SUPPORTED

    MCS Set
      MCS  0                                      : SUPPORTED
      MCS  1                                      : SUPPORTED
```

```
       MCS  2                                   : SUPPORTED
       MCS  3                                   : SUPPORTED
       MCS  4                                   : SUPPORTED
       MCS  5                                   : SUPPORTED
       MCS  6                                   : SUPPORTED
       MCS  7                                   : SUPPORTED
       MCS  8                                   : SUPPORTED
       MCS  9                                   : SUPPORTED
       MCS 10                                   : SUPPORTED
       MCS 11                                   : SUPPORTED
       MCS 12                                   : SUPPORTED
       MCS 13                                   : SUPPORTED
       MCS 14                                   : SUPPORTED
       MCS 15                                   : SUPPORTED
       MCS 16                                   : DISABLED
       MCS 17                                   : DISABLED
       MCS 18                                   : DISABLED
       MCS 19                                   : DISABLED
       MCS 20                                   : DISABLED
       MCS 21                                   : DISABLED
       MCS 22                                   : DISABLED
       MCS 23                                   : DISABLED

     Beacon Period                              : 100
     Fragmentation Threshold                    : 2346
     Multi Domain Capability Implemented        : True
     Multi Domain Capability Enabled            : True
     Country String                             : US

   Multi Domain Capability
     Configuration                              : Automatic
     First Channel                              : 0
     Number of Channels                         : 0
     Country String                             : US

   MAC Operation Parameters
     Configuration                              : Automatic
     Fragmentation Threshold                    : 2346
     Packet Retry Limit                         : 64
     Legacy Tx Beamforming Setting              : Disabled

   Tx Power
     Number of Supported Power Levels           : 8
     Tx Power Level 1                           : 20 dBm
     Tx Power Level 2                           : 17 dBm
     Tx Power Level 3                           : 14 dBm
     Tx Power Level 4                           : 11 dBm
     Tx Power Level 5                           : 8 dBm
     Tx Power Level 6                           : 5 dBm
     Tx Power Level 7                           : 2 dBm
     Tx Power Level 8                           : -1 dBm
     Tx Power Configuration                     : Automatic
     Current Tx Power Level                     : 1

   Phy OFDM Parameters
     Configuration                              : Automatic
     Current Channel                            : 11
     Extension Channel                          : None
     Channel Width                              : 20 MHz
     Allowed Channel List                       : 1, 2, 3, 4, 5, 6, 7, 8, 9
                                                  10, 11
     TI Threshold                               : 0
     Antenna Type                               : Internal
     Internal Antenna Gain (in .5 dBi units)    : 0
```

```
   Diversity                                : Diversity enabled

   802.11n Antennas
     Tx                                     : A, B, C
     Rx                                     : A, B, C

 Performance Profile Parameters
   Configuration                            : Automatic
   Interference Threshold                   : 10%
   Noise Threshold                          : -70 dBm
   RF Utilization Threshold                 : 80%
   Data Rate Threshold                      : 1000000 bps
   Client Threshold                         : 12 clients
   Coverage SNR Threshold                   : 15 dB
   Coverage Exception Level                 : 25%
   Client Minimum Exception Level           : 3 clients
   RTS/CTS Threshold                        : 2347
   Short Retry Limit                        : 7
   Long Retry Limit                         : 4
   Max Tx MSDU Lifetime                     : 512
   Max Rx Lifetime                          : 512

 CleanAir Management Information
   CleanAir Capable                         : Yes
   CleanAir Management Admin State          : Enabled
   CleanAir Management Operation State      : Up
   Rapid Udpate Mode                        : Disabled
   Spectrum Expert connection               : Disabled
   CleanAir NSI Key                         : 377313C8F290E246E640C4EF177BED
88
   Spectrum Expert connections counter      : 0
   CleanAir Sensor State                    : Configured

 Rogue Containment Information
   Containment Count                        : 0
```

# show ap name config slot

To display configuration information for slots on a specific Cisco lightweight access point, use the **show ap name config slot** command.

**show ap name** *ap-name* **config slot** {**0|1|2|3**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **0** | Displays slot number 0. |
| **1** | Displays slot number 1. |
| **2** | Displays slot number 2. |
| **3** | Displays slot number 3. |

**Command Default**      None

**Command Modes**      Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display configuration information for slots on an access point:

```
Switch# show ap name AP01 config slot 0

Cisco AP Identifier                            : 3
Cisco AP Name                                  : AP01
Country Code                                   : US  - United States
Regulatory Domain Allowed by Country           : 802.11bg:-A    802.11a:-A
AP Country Code                                : US  - United States
AP Regulatory Domain                           : -A
Switch Port Number                             : Te1/0/1
MAC Address                                    : 0000.2000.02f0
IP Address Configuration                       : Static IP assigned
IP Address                                     : 10.10.10.12
IP Netmask                                     : 255.255.0.0
Gateway IP Address                             : 10.10.10.1
Fallback IP Address Being Used                 : 10.10.10.12
Domain                                         : Cisco
Name Server                                    : 0.0.0.0
CAPWAP Path MTU                                 : 1485
Telnet State                                   : Enabled
SSH State                                      : Disabled
Cisco AP Location                              : sanjose
Cisco AP Group Name                            : default-group
Administrative State                           : Enabled
Operation State                                : Registered
AP Mode                                        : Local
AP Submode                                     : Not Configured
Remote AP Debug                                : Disabled
Logging Trap Severity Level                    : informational
```

```
Software Version                               : 7.4.0.5
Boot Version                                   : 7.4.0.5
Mini IOS Version                               : 3.0.51.0
Stats Reporting Period                         : 180
LED State                                      : Enabled
PoE Pre-Standard Switch                        : Disabled
PoE Power Injector MAC Address                 : Disabled
Power Type/Mode                                : Power Injector/Normal Mode
Number of Slots                                : 2
AP Model                                       : 1140AG
AP Image                                       : C1140-K9W8-M
IOS Version                                    :
Reset Button                                   :
AP Serial Number                               : SIM1140K001
AP Certificate Type                            : Manufacture Installed
Management Frame Protection Validation         : Disabled
AP User Mode                                   : Customized
AP User Name                                   : cisco
AP 802.1X User Mode                            : Not Configured
AP 802.1X User Name                            : Not Configured
Cisco AP System Logging Host                   : 255.255.255.255
AP Up Time                                     : 15 days 16 hours 1 minute 19 s
econds
AP CAPWAP Up Time                              : 20 hours 21 minutes 37 seconds

Join Date and Time                             : 10/17/2012 08:13:36
Join Taken Time                                : 14 days 19 hours 39 minutes 41
 seconds

Attributes for Slot 0
  Radio Type                                   : 802.11n - 2.4 GHz
  Administrative State                         : Enabled
  Operation State                              : Up
  Cell ID                                      : 0

  Station Configuration
    Configuration                              : Automatic
    Number of WLANs                            : 1
    Medium Occupancy Limit                     : 100
    CFP Period                                 : 4
    CFP Maximum Duration                       : 60
    BSSID                                      : 000020000200

    Operation Rate Set
       1000 Kbps                               : MANDATORY
       2000 Kbps                               : MANDATORY
       5500 Kbps                               : MANDATORY
      11000 Kbps                               : MANDATORY
       6000 Kbps                               : SUPPORTED
       9000 Kbps                               : SUPPORTED
      12000 Kbps                               : SUPPORTED
      18000 Kbps                               : SUPPORTED
      24000 Kbps                               : SUPPORTED
      36000 Kbps                               : SUPPORTED
      48000 Kbps                               : SUPPORTED
      54000 Kbps                               : SUPPORTED

    MCS Set
     MCS  0                                    : SUPPORTED
     MCS  1                                    : SUPPORTED
     MCS  2                                    : SUPPORTED
     MCS  3                                    : SUPPORTED
     MCS  4                                    : SUPPORTED
     MCS  5                                    : SUPPORTED
```

```
          MCS  6                            : SUPPORTED
          MCS  7                            : SUPPORTED
          MCS  8                            : SUPPORTED
          MCS  9                            : SUPPORTED
          MCS 10                            : SUPPORTED
          MCS 11                            : SUPPORTED
          MCS 12                            : SUPPORTED
          MCS 13                            : SUPPORTED
          MCS 14                            : SUPPORTED
          MCS 15                            : SUPPORTED
          MCS 16                            : DISABLED
          MCS 17                            : DISABLED
          MCS 18                            : DISABLED
          MCS 19                            : DISABLED
          MCS 20                            : DISABLED
          MCS 21                            : DISABLED
          MCS 22                            : DISABLED
          MCS 23                            : DISABLED

       Beacon Period                        : 100
       Fragmentation Threshold              : 2346
       Multi Domain Capability Implemented  : True
       Multi Domain Capability Enabled      : True
       Country String                       : US

    Multi Domain Capability
       Configuration                        : Automatic
       First Channel                        : 0
       Number of Channels                   : 0
       Country String                       : US

    MAC Operation Parameters
       Configuration                        : Automatic
       Fragmentation Threshold              : 2346
       Packet Retry Limit                   : 64

    Tx Power
       Number of Supported Power Levels     : 8
       Tx Power Level 1                     : 20 dBm
       Tx Power Level 2                     : 17 dBm
       Tx Power Level 3                     : 14 dBm
       Tx Power Level 4                     : 11 dBm
       Tx Power Level 5                     : 8 dBm
       Tx Power Level 6                     : 5 dBm
       Tx Power Level 7                     : 2 dBm
       Tx Power Level 8                     : -1 dBm
       Tx Power Configuration               : Automatic
       Current Tx Power Level               : 1

    Phy OFDM Parameters
       Configuration                        : Automatic
       Current Channel                      : 11
       Extension Channel                    : None
       Channel Width                        : 20 MHz
       Allowed Channel List                 : 1, 2, 3, 4, 5, 6, 7, 8, 9
                                              10, 11
       TI Threshold                         : 0
       Antenna Type                         : Internal
       Internal Antenna Gain (in .5 dBi units) : 0
       Diversity                            : Diversity enabled

       802.11n Antennas
         Tx                                 : A, B, C
         Rx                                 : A, B, C
```

```
Performance Profile Parameters
  Configuration                        : Automatic
  Interference Threshold               : 10%
  Noise Threshold                      : -70 dBm
  RF Utilization Threshold             : 80%
  Data Rate Threshold                  : 1000000 bps
  Client Threshold                     : 12 clients
  Coverage SNR Threshold               : 15 dB
  Coverage Exception Level             : 25%
  Client Minimum Exception Level       : 3 clients

Rogue Containment Information
  Containment Count                    : 0
```

# show ap name core-dump

To display the memory core dump information for a lightweight access point, use the **show ap name core-dump** command.

**show ap name** *ap-name* **core-dump**

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the memory core dump information:

```
Switch# show ap name 3602a core-dump

TFTP server IP : 172.31.25.21
Memory core dump file : 3602a.dump
Memory core dump file compressed : Disabled
```

**Related Topics**

# show ap name data-plane

To display the data plane status of a specific Cisco lightweight access point, use the **show ap name data-plane** command.

**show ap name** *ap-name* **data-plane**

**Syntax Description**

| *ap-name* | Name of the Cisco lightweight access point. |
|---|---|

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the data plane status of an access point:

```
Switch# show ap name AP01 data-plane

                   Min Data        Data        Max Data    Last
AP Name            Round Trip   Round Trip   Round Trip   Update
------------------ ------------- ------------- ------------- --------
AP01                  0.000s       0.000s       0.000s    00:00:00
```

# show ap name dot11

To display 802.11a or 802.11b configuration information that corresponds to specific Cisco lightweight access points, use the **show ap name dot11** command.

**show ap name** *ap-name* **dot11** {**24ghz|5ghz**} {**ccx|cdp|profile|service-poicy output|stats|tsm** {**all***client-mac*}}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **24ghz** | Displays the 2.4 GHz band. |
| **5ghz** | Displays the 5 GHz band. |
| **ccx** | Displays the Cisco Client eXtensions (CCX) radio management status information. |
| **cdp** | Displays Cisco Discovery Protocol (CDP) information. |
| **profile** | Displays configuration and statistics of 802.11 profiling. |
| **service-policy output** | Displays downstream service policy information. |
| **stats** | Displays Cisco lightweight access point statistics. |
| **tsm** | Displays 802.11 traffic stream metrics statistics. |
| **all** | Displays the list of all access points to which the client has associations. |
| *client-mac* | MAC address of the client. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the service policy that is associated with the access point:

```
Switch# show ap name test-ap dot11 24ghz service-policy output

Policy Name  : test-ap1
Policy State : Installed
```

This example shows how to display the CCX RRM 802.11 configuration for a specific access point:

```
Switch# show ap name AP01 dot11 24ghz ccx
```

This example show how to display CDP information for a specific access point:

```
Switch# show ap name AP01 dot11 24ghz cdp

AP Name              AP CDP State
-------------------- -------------
AP03                 Disabled
```

This example show how to display the configuration and statistics of 802.11b profiling for a specific access point:

```
Switch# show ap name AP01 dot11 24ghz profile

 802.11b Cisco AP performance profile mode         : GLOBAL
 802.11b Cisco AP Interference threshold           : 10 %
 802.11b Cisco AP noise threshold                  : -70 dBm
 802.11b Cisco AP RF utilization threshold         : 80 %
 802.11b Cisco AP throughput threshold             : 1000000 bps
 802.11b Cisco AP clients threshold                : 12 clients
```

This example show how to display downstream service policy information for a specific access point:

```
Switch# show ap name AP01 dot11 24ghz service-policy output

Policy Name  : def-11gn
Policy State : Installed
```

This example show how to display statistics for a specific access point:

```
Switch# show ap name AP01 dot11 24ghz stats

Number of Users..................................: 0
TxFragmentCount..................................: 0
MulticastTxFrameCnt..............................: 0
FailedCount......................................: 0
RetryCount.......................................: 0
MultipleRetryCount...............................: 0
FrameDuplicateCount..............................: 0
RtsSuccessCount..................................: 0
RtsFailureCount..................................: 0
AckFailureCount..................................: 0
RxIncompleteFragment.............................: 0
MulticastRxFrameCnt..............................: 0
FcsErrorCount....................................: 0
TxFrameCount.....................................: 0
WepUndecryptableCount............................: 0
TxFramesDropped..................................: 0

Call Admission Control (CAC) Stats
  Voice Bandwidth in use(% of config bw).........: 0
  Video Bandwidth in use(% of config bw).........: 0
  Total BW in use for Voice(%)...................: 0
  Total BW in use for SIP Preferred call(%)......: 0

Load based Voice Call Stats
  Total channel MT free..........................: 0
  Total voice MT free............................: 0
  Na Direct......................................: 0
  Na Roam........................................: 0

WMM TSPEC CAC Call Stats
  Total num of voice calls in progress...........: 0
  Num of roaming voice calls in progress.........: 0
  Total Num of voice calls since AP joined.......: 0
```

```
       Total Num of roaming calls since AP joined.....: 0
       Total Num of exp bw requests received..........: 0
       Total Num of exp bw requests admitted..........: 0
       Num of voice calls rejected since AP joined....: 0
       Num of roam calls rejected since AP joined.....: 0
       Num of calls rejected due to insufficent bw....: 0
       Num of calls rejected due to invalid params....: 0
       Num of calls rejected due to PHY rate..........: 0
       Num of calls rejected due to QoS policy........: 0

     SIP CAC Call Stats
       Total Num of calls in progress.................: 0
       Num of roaming calls in progress...............: 0
       Total Num of calls since AP joined.............: 0
       Total Num of roaming calls since AP joined.....: 0
       Total Num of Preferred calls received..........: 0
       Total Num of Preferred calls accepted..........: 0
       Total Num of ongoing Preferred calls...........: 0
       Total Num of calls rejected(Insuff BW).........: 0
       Total Num of roam calls rejected(Insuff BW)....: 0

     Band Select Stats
       Num of dual band client .......................: 0
       Num of dual band client added..................: 0
       Num of dual band client expired ...............: 0
       Num of dual band client replaced...............: 0
       Num of dual band client detected ..............: 0
       Num of suppressed client ......................: 0
       Num of suppressed client expired...............: 0
       Num of suppressed client replaced..............: 0
```

This example show how to display the traffic stream configuration for all clients that correspond to a specific access point:

```
Switch# show ap name AP01 dot11 24ghz tsm all
```

# show ap name dot11 cleanair

To display CleanAir configuration information that corresponds to an access point, use the **show ap name dot11 cleanair** command.

**show ap name** *ap-name* **dot11** {**24ghz**|**5ghz**} **cleanair** {**air-quality**|**device**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **24ghz** | Displays the 2.4 GHz band. |
| **5ghz** | Displays the 5 GHz band. |
| **cleanair** | Displays CleanAir configuration information. |
| **air-quality** | Displays CleanAir air-quality (AQ) data. |
| **device** | Displays CleanAir interferers for an access point on the 5 GHz band. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display CleanAir air-quality information for an access point in the 802.11b network:

```
Switch# show ap name AP01 dot11 24ghz cleanair air-quality

AQ = Air Quality
DFS = Dynamic Frequency Selection
```

This example shows how to display CleanAir interferers information for an access point in the 802.11b network:

```
Switch# show ap name AP01 dot11 24ghz cleanair device

DC   = Duty Cycle (%)
ISI  = Interference Severity Index (1-Low Interference, 100-High Interference)
RSSI = Received Signal Strength Index (dBm)
DevID = Device ID

No ClusterID DevID Type AP Name ISI RSSI DC Channel
-- --------- ----- ---- ------- --- ---- ----------
```

# show ap name env

To show AP environment on a specific AP, use the **show ap name env** command.

**show ap name** *ap-name* **env**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the specific AP. |

**Command Default**  None

**Command Modes**  Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to show AP environment on AP1:

```
Switch# show ap name ap1 env
```

# show ap name ethernet statistics

To display the Ethernet statistics of a specific Cisco lightweight access point, use the **show ap name ethernet statistics** command.

**show ap name** *ap-name* **ethernet statistics**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**

None.

**Command Modes**

User EXEC.

Privileged EXEC.

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the Ethernet statistics of an access point:

```
Switch# show ap name 3602a ethernet statistics

Ethernet Stats for AP 3602a

Interface Name     Status   Speed      Rx Packets    Tx Packets    Discarded Packets
-------------------------------------------------------------------------------------
GigabitEthernet0   UP       1000 Mbps  3793          5036          0
```

# show ap name eventlog

To download and display the event log of a specific Cisco lightweight access point, use the **show ap name eventlog** command.

**show ap name** *ap-name* **eventlog**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the event log for a specific access point:

```
Switch# show ap name AP01 eventlog
```

# show ap gps-location summary

To show GPS location summary of all connected Cisco APs, use the **show ap gps-location summary** command. There is no keyword or argument.

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to show GPS location summary of all connected Cisco APs:

```
Switch# show ap gps-location summary
```

# show ap name image

To display the detailed information about the predownloaded image for specified access points, use the **show ap name image** command.

**show ap name** *ap-name* **image**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display images present on all access points:

```
Switch# show ap name 3602a image

Total number of APs  : 1

Number of APs
        Initiated                : 0
        Predownloading           : 0
        Completed predownloading : 0
        Not Supported            : 1
        Failed to Predownload    : 0

AP Name      Primary Image   Backup Image    Predownload Status    Predownload Ver... Next
  Retry Time    Retry Count
-----------------------------------------------------------------------------------------------
3602a        10.0.1.234      0.0.0.0         Not supported         None               NA
                      0
```

# show ap name inventory

To display inventory information for an access point, use the **show ap name inventory** command.

**show ap name** *ap-name* **inventory**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display inventory information for an access point:

```
Switch# show ap name 3502b inventory

NAME: Cisco AP    , DESCR: Cisco Wireless Access Point
PID: 1140AG  ,  VID: V01,  SN: SIM1140K001


NAME:      , DESCR:
PID: ,  VID: ,  SN:


NAME:      , DESCR:
PID: ,  VID: ,  SN:
NAME: Cisco AP    , DESCR: Cisco Wireless Access Point
PID: 3502I  ,  VID: V01,  SN: FTX1525E94A


NAME: Dot11Radio0    , DESCR: 802.11N 2.4GHz Radio
PID: UNKNOWN,  VID:   ,  SN: FOC1522BLNA


NAME: Dot11Radio1    , DESCR: 802.11N 5GHz Radio
PID: UNKNOWN,  VID:   ,  SN: FOC1522BLNA
```

# show ap name lan port

To display LAN information, use **show ap name lan port** command.

**show ap name lan port summary** | *port-id*

**Syntax Description**

| | |
|---|---|
| **summary** | Displays brief summary for LAN information. |
| *port-id* | Port ID of the port that the LAN information will be displayed. |

**Command Default**     None

**Command Modes**     Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7SE | This command was introduced. |

This example shows how to display the brief summary for LAN information:

```
Switch# show ap name ap1 lan port summary
```

# show ap name link-encryption

To display the link-encryption status for a specific Cisco lightweight access point, use the **show ap name link-encryption** command.

**show  ap  name** *ap-name*  **link-encryption**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display the link-encryption status for a specific Cisco lightweight access point:

```
Switch# show ap name AP01 link-encryption

                    Encryption  Dnstream  Upstream    Last
AP Name                  State     Count     Count  Update
------------------  ----------  --------  --------  ------
AP01                  Disabled         0         0   Never
```

# show ap name service-policy

To display service-policy information for a specific Cisco lightweight access point, use the **show ap name service-policy** command.

**show ap name** *ap-name* **service-policy**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display service-policy information for a specific Cisco lightweight access point:

```
Switch# show ap name 3502b service-policy

NAME: Cisco AP    , DESCR: Cisco Wireless Access Point
PID: 3502I  ,  VID: V01,  SN: FTX1525E94A


NAME: Dot11Radio0    , DESCR: 802.11N 2.4GHz Radio
PID: UNKNOWN,  VID:  ,  SN: FOC1522BLNA


NAME: Dot11Radio1    , DESCR: 802.11N 5GHz Radio
PID: UNKNOWN,  VID:  ,  SN: FOC1522BLNA
```

# show ap name tcp-adjust-mss

To display TCP maximum segment size (MSS) for an access point, use the **show ap name tcp-adjust-mss** command.

**show ap name** *ap-name* **tcp-adjust-mss**

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |

**Command Default**    None

**Command Modes**    Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display TCP MSS for an access point:

```
Switch# show ap name AP01 tcp-adjust-mss

AP Name               TCP State       MSS Size
----------------------------------------------------
AP01                  Disabled        6146
```

# show ap name wlan

To display the Basic Service Set Identifier (BSSID) value for each WLAN defined on an access point and to display WLAN statistics, use the **show ap name wlan** command.

**show ap name** *ap-name* **wlan** {**dot11** {**24ghz|5ghz**}|**statistic**}

**Syntax Description**

| | |
|---|---|
| *ap-name* | Name of the Cisco lightweight access point. |
| **dot11** | Displays 802.11 parameters. |
| **24ghz** | Displays 802.11b network settings. |
| **5ghz** | Displays 802.11a network settings. |
| **statistic** | Displays WLAN statistics. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display BSSID information of an access point in an 802.11b network:

```
Switch# show ap name AP01 wlan dot11 24ghz

Site Name                                         : default-group
Site Description                                  :

WLAN ID   Interface  BSSID
-----------------------------------
1         default    00:00:20:00:02:00
12        default    00:00:20:00:02:0b
```

This example shows how to display WLAN statistics for an access point:

```
Switch# show ap name AP01 wlan statistic

WLAN ID  : 1
WLAN Profile Name  : maria-open

   EAP Id Request Msg Timeouts            : 0
   EAP Id Request Msg Timeouts Failures   : 0
   EAP Request Msg Timeouts               : 0
   EAP Request Msg Timeouts Failures      : 0
   EAP Key Msg Timeouts                   : 0
   EAP Key Msg Timeouts Failures          : 0


WLAN ID  : 12
WLAN Profile Name  : 24
```

```
EAP Id Request Msg Timeouts          : 0
EAP Id Request Msg Timeouts Failures : 0
EAP Request Msg Timeouts             : 0
EAP Request Msg Timeouts Failures    : 0
EAP Key Msg Timeouts                 : 0
EAP Key Msg Timeouts Failures        : 0
```

# show ap name wlandot11 service policy

To display the QoS policies for each Basic Service Set Identifier (BSSID) for an access point use commands

**show apname***ap -name***wlan dot1124ghzservice-policy**

**show apname***ap -name***wlan dot115ghzservice-policy**

| | | |
|---|---|---|
| **Syntax Description** | *ap- name* | Name of the Cisco lightweight access point. |
| | **service-policy** | Service policy information for access point. |

**Command Default**    None

| **Command History** | **Release** | **Modification** |
|---|---|---|
| | Cisco IOS XE 3.3SE | This command was introduced. |

**Example**

The following example shows how to display QoS policies for each BSSID.

Switch**show ap name <ap-name> wlan dot11 24ghz service-policy**

# show ap slots

To display a slot summary of all connected Cisco lightweight access points, use the **show ap slots** command.

**show  ap  slots**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display a slot summary of all connected Cisco lightweight access points:

```
Controller# show ap slots

AP Name    Slots  AP Model    Slot0       Slot1      Slot2     Slot3
---------- ------ ----------- ----------- ---------- --------- --------
3602a      2      3502I       802.11b/g   802.11a    Unknown   Unknown
```

# show ap summary

To display the status summary of all Cisco lightweight access points attached to the switch, use the **show ap summary** command.

**show ap summary**

| Syntax Description | This command has no keywords and arguments. |
| --- | --- |

**Command Default** None

**Command Modes** Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines** Use this command to display a list that contains each lightweight access point name, number of slots, manufacturer, MAC address, location, and the switch port number.

This example shows how to display a summary of all connected access points:

```
Controller# show ap summary

Number of APs: 1

Global AP User Name: Cisco
Global AP Dot1x User Name: Not configured

AP Name                         AP Model  Ethernet MAC    Radio MAC       State
--------------------------------------------------------------------------------
3602a                           3502I     003a.99eb.3fa8  d0c2.8267.8b00  Registered
```

# show ap tcp-adjust-mss

To display information about the Cisco lightweight access point TCP Maximum Segment Size (MSS), use the **show ap tcp-adjust-mss** command.

**show ap tcp-adjust-mss**

**Syntax Description**

This command has no keywords and arguments.

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to display information about the access point TCP MSS information:

```
Controller# show ap tcp-adjust-mss

AP Name                 TCP State      MSS Size
------------------------------------------------------
3602a                   Disabled       0
```

# show ap universal summary

To show universal summary of all connected Cisco APs, use the **show ap universal summary** command. There is no keyword or argument.

**Command Default**     None

**Command Modes**     Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.7.0 E | This command was introduced. |

This example shows how to show universal summary of all connected Cisco APs:

```
Switch# show ap universal summary
```

# show ap uptime

To display the up time of all connected Cisco lightweight access points, use the **show ap uptime** command.

**show  ap  uptime**

**Syntax Description**   This command has no keywords and arguments.

**Command Default**   None

**Command Modes**   Any command mode

**Command History**

| Release | Modification |
|---------|--------------|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to the display up time of all connected access points:

```
Controller# show ap uptime

Number of APs : 1

Global AP User Name : Cisco
Global AP Dot1x User Name : Not configured

AP Name Ethernet MAC    AP Up Time                    Association Up Time

------- --------------- ----------------------------- -----------------------------
3602a   003a.99eb.3fa8  5 hours 13 minutes 40 seconds  5 hours 12 minutes 15 seconds
```

# show wireless ap summary

To display the status summary of all wireless access points, use the **show wireless apsummary** command.

**show  wirelessap  summary**

**Syntax Description** | This command has no keywords and arguments.

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| 10.4 | This command was introduced |

This example shows how to display a summary of all wireless access points:

```
Controller# show wireless ap summary
Sub-Domain Access Point Summary

Maximum AP limit: 1010
Total AP Licence Installed: 1000
Total AP Licence Available: 1000
Total AP joined :0
```

# show wireless client ap

To display the clients on a Cisco lightweight access point, use the **show wireless client ap** command.

**show wireless client ap** [**name** *ap-name*] **dot11** {**24ghz**|**5ghz**}

| Syntax Description | | |
|---|---|---|
| **name** *ap-name* | (Optional) Displays the name of the Cisco lightweight access point. |
| **dot11** | Displays 802.11 parameters. |
| **24ghz** | Displays the 2.4 GHz band. |
| **5ghz** | Displays the 5 GHz band. |

**Command Default**      None

**Command Modes**      Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

**Usage Guidelines**      The **show client ap** command might list the status of automatically disabled clients. Use the **show exclusionlist** command to view clients on the exclusion list (blacklisted).

This example shows how to display client information on a specific Cisco lightweight access point in the 2.4 GHz band:

```
Switch# show wireless client ap name AP01 dot11 24ghz

MAC Address      AP Id  Status     WLAN Id Authenticated
----------------- ------ ---------- ------- -------------
xx:xx:xx:xx:xx:xx 1      Associated 1       No
```

# test ap name

To enable automatic testing of the path Maximum Transmit Unit (MTU) between the access point and the switch, use the **test ap name** command.

**test ap name** *ap-name* **pmtu** {**disable size** *size*|**enable**}

| Syntax Description | | |
|---|---|---|
| *ap-name* | Name of the target Cisco lightweight access point. | |
| **pmtu** | Tests the MTU configuration for the access point. | |
| **disable** | Disables path MTU testing and manually configures the MTU value in bytes. | |
| **size** *size* | Specifies the path MTU size. | |
| | **Note** | The range is from 576 to 1700. |
| **enable** | Enables the path MTU testing for the access point. | |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to disable the path MTU configuration for all access points associated to the switch:

```
Controller# test ap name 3602a pmtu enable
```

# test capwap ap name

To test Control and Provisioning of Wireless Access Points (CAPWAP) parameters for a specific Cisco lightweight access points, use the **test capwap ap name** command.

**test capwap ap name** *ap-name* {**encryption** {**enable**|**disable**}|**message** *token*}

| Syntax Description | *ap-name* | Name of the Cisco lightweight access point. |
| --- | --- | --- |
| | **encryption** | Tests the Datagram Transport Layer Security (DTLS) encryption. |
| | **enable** | Tests if DTLS encryption is enabled. |
| | **disable** | Tests if DTLS encryption is disabled. |
| | **message** *token* | Specifies an RRM neighbor message to send. |

**Command Default**  None

**Command Modes**  Any command mode

**Command History**

| Release | Modification |
| --- | --- |
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to test if DTLS encryption is enabled for a specific access point:

```
Controller# test capwap ap name 3602a encryption enable
```

This example shows how to test if DTLS encryption is disabled for a specific access point:

```
Controller# test capwap ap name 3602a encryption disable
```

# trapflags ap

To enable the sending of specific Cisco lightweight access point traps, use the **trapflags ap** command. To disable the sending of Cisco lightweight access point traps, use the **no** form of this command.

**trapflags ap** {**register|interfaceup**}
**no trapflags ap** {**register|interfaceup**}

| Syntax Description | | |
|---|---|---|
| **register** | Enables sending a trap when a Cisco lightweight access point registers with a Cisco switch. |
| **interfaceup** | Enables sending a trap when a Cisco lightweight access point interface (A or B) comes up. |

**Command Default**   Enabled

**Command Modes**   Global configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |

This example shows how to prevent traps from sending access point-related traps:

```
Switch(config)# no trapflags ap register
```

# wireless probe filter

To configure filtering of probe requests from AP, use **wireless probe filter**command. Use the **no** form of the command to disable the feature.

**[no] wireless probe filter**

**Syntax Description**

| | |
|---|---|
| **filter** | Configures filtering of probe requests from AP. |

**Command Default**

Enabled

**Command Modes**

Global Configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE Denali 16.3.1 | This command was introduced. |

**Example**

This example shows how to configure filtering of probe requests from AP.

```
Switchwireless probe filter
```

# wireless probe limit

To configure number of probe requests sent to the device per client per access point radio in a given interval, use **wireless probe limit** *num_probes interval*command. Use the **no** form of the command to disable the feature.

**[no] wireless probe limit** *num_probes interval*

| Syntax Description | | |
|---|---|---|
| *num_probes* | Number of probe requests forwarded to the device per client per access point radio in a given interval. The range is from 1 to 100. |
| *interval* | Probe limit interval in milliseconds. The range is from 100 to 10000 |

**Command Default**    None

**Command Modes**    Global Configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE Denali 16.3.1 | This command was introduced. |

**Example**

This example shows how to configure 10 probe requests sent to the device per client per access point radio in an interval of 1000 milliseconds.

```
Switchwireless probe limit 10 1000
```

# wireless wps rogue ap rldp alarm-only

To configure an alarm when a rogue is detected, use **wirelesswps rogueaprldp alarm-only** command. Use the **no** form of the command to disable the alarm.

**[no] wireless wps rogue ap rldp alarm-only monitor-ap-only**

**Syntax Description**

| | |
|---|---|
| **monitor-ap-only** | Perform RLDP only on monitor AP |

**Command Default**  None

**Command Modes**  Global Configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |
| Cisco IOS XE 3.7.3E | The **no** form of the command was introduced. |

**Example**

This example shows how to configure an alarm for a detected rogue.

Switch**wireless wps rogue ap rldp alarm-only**

# wireless wps rogue ap rldp auto-contain

To configure RLDP, alarm and auto-contain if rogue is detected, use **wirelesswps rogueaprldp auto-contain** command. Use the **no** form of the command to disable the alarm.

**[no] wireless wps rogue ap rldp auto-contain monitor-ap-only**

**Syntax Description**

| | |
|---|---|
| **monitor-ap-only** | Perform RLDP only on monitor AP |

**Command Default**    None

**Command Modes**    Global Configuration

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2SE | This command was introduced. |
| Cisco IOS XE 3.7.3E | The **no** form of the command was introduced. |

**Example**

This example shows how to configure an alarm for a detected rogue.

Switch**wireless wps rogue ap rldp auto-contain**