



802.11 parameters and Band Selection

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Finding Feature Information

Your software release may not support all of the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

Restrictions on Band Selection, 802.11 Bands, and Parameters

- Band selection-enabled WLANs do not support time-sensitive applications such as voice and video because of roaming delays.
- Band selection can be used only with Cisco Aironet 1140, 1250, 1260, 1550, 1800, 2600, 2800, 3500, 3600, 3800 Series access points.
- Mid-RSSI is not supported on Cisco Aironet 1600 Series access points.
- Band selection is not supported in Cisco Aironet 1040, OEAP 600 Series access points.
- Band selection operates only on access points that are connected to a controller. A FlexConnect access point without a controller connection does not perform band selection after a reboot.

- The band-selection algorithm directs dual-band clients only from the 2.4-GHz radio to the 5-GHz radio of the same access point, and it only runs on an access point when both the 2.4-GHz and 5-GHz radios are up and running.
- You can enable both band selection and aggressive load balancing on the controller. They run independently and do not impact one another.
- It is not possible to enable or disable band selection and client load balancing globally through the controller GUI or CLI. You can, however, enable or disable band selection and client load balancing for a particular WLAN. Band selection and client load balancing are enabled globally by default.

Information About Configuring Band Selection, 802.11 Bands, and Parameters

Band Selection

Band selection enables client radios that are capable of dual-band (2.4 and 5-GHz) operations to move to a less congested 5-GHz access point. The 2.4-GHz band is often congested. Clients on this band typically experience interference from Bluetooth devices, microwave ovens, and cordless phones as well as co-channel interference from other access points because of the 802.11b/g limit of 3 nonoverlapping channels. To prevent these sources of interference and improve overall network performance, configure band selection on the device.

Band selection works by regulating probe responses to clients and it can be enabled on a per-WLAN basis. It makes 5-GHz channels more attractive to clients by delaying probe responses to clients on 2.4-GHz channels. In an access point, the band select table can be viewed by running the **show dot11 band-select** command. It can also be viewed by running the **show cont d0/d1 | begin Lrucommand**.



Note The WMM default configuration is not shown in the **show running-config** command output.

Band Selection Algorithm

The band selection algorithm affects clients that use 2.4-GHz band. Initially, when a client sends a probe request to an access point, the corresponding client probe's Active and Count values (as seen from the band select table) become 1. The algorithm functions based on the following scenarios:

- Scenario 1—Client RSSI (as seen from the **show cont d0/d1 | begin RSSI** command output) is greater than both Mid RSSI and Acceptable Client RSSI.
 - Dual-band clients—No 2.4-GHz probe responses are seen at any time; 5-GHz probe responses are seen for all 5-GHz probe requests.
 - Single-band (2.4-GHz) clients—2.4-GHz probe responses are seen only after the probe suppression cycle.
 - After the client's probe count reaches the configured probe cycle count, the algorithm waits for the Age Out Suppression time and then marks the client probe's Active value as 0. Then, the algorithm is restarted.

- Scenario2—Client RSSI (as seen from **show cont d0/d1 | begin RSSI**) lies between Mid-RSSI and Acceptable Client RSSI.
 - All 2.4-GHz and 5-GHz probe requests are responded to without any restrictions.
 - This scenario is similar to the band select disabled.



Note The client RSSI value (as seen in the **sh cont d0 | begin RSSI** command output) is the average of the client packets received, and the Mid RSSI feature is the instantaneous RSSI value of the probe packets. As a result, the client RSSI is seen as weaker than the configured Mid RSSI value (7-dB delta). The 802.11b probes from the client are suppressed to push the client to associate with the 802.11a band.

802.11 Bands

You can configure the 802.11b/g/n (2.4 GHz) and 802.11a/n (5 GHz) bands for the controller to comply with the regulatory requirements in your country. By default, both 802.11b/g/n and 802.11a/n are enabled.

When a controller is configured to allow only 802.11g traffic, 802.11b client devices are able to successfully connect to an access point, but cannot pass traffic. When you configure the controller only for 802.11g traffic, you must mark 11g rates as mandatory.



Note The Block Acks in a Cisco 2800, 3800, 1560 APs are sent at configured mandatory data rates in Cisco WLC for 2.4 GHz radio.

802.11n Parameters

This section provides instructions for managing 802.11n access points on your network. The 802.11n devices support the 2.4 and 5-GHz bands and offer high throughput data rates.

The 802.11n high throughput rates are available on all the 802.11n access points for the WLANs using WMM with no Layer 2 encryption or with WPA2/AES encryption enabled.



Note Some Cisco 802.11n APs may intermittently emit incorrect beacon frames, which can trigger false WIPS alarms. We recommend that you ignore these alarms. The issue is observed in the following Cisco 802.11n APs: 1140, 1250, 2600, 3500, and 3600.

802.11h Parameters

802.11h informs client devices about channel changes and can limit the transmit power of those client devices.

How to Configure 802.11 Bands and Parameters

Configuring Band Selection (CLI)

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 2	wireless client band-select cycle-count <i>cycle_count</i> Example: Device(config)# <code>wireless client band-select cycle-count 3</code>	Sets the probe cycle count for band select. Valid range is between 1 and 10.
Step 3	wireless client band-select cycle-threshold <i>milliseconds</i> Example: Device(config)# <code>wireless client band-select cycle-threshold 5000</code>	Sets the time threshold for a new scanning cycle period. Valid range is between 1 and 1000.
Step 4	wireless client band-select expire suppression <i>seconds</i> Example: Device(config)# <code>wireless client band-select expire suppression 100</code>	Sets the suppression expire to the band select. Valid range is between 10 and 200.
Step 5	wireless client band-select expire dual-band <i>seconds</i> Example: Device(config)# <code>wireless client band-select expire dual-band 100</code>	Sets the dual band expire. Valid range is between 10 and 300.
Step 6	wireless client band-select client-rssi <i>client_rssi</i> Example: Device(config)# <code>wireless client band-select client-rssi 40</code>	Sets the client RSSI threshold. Valid range is between 20 and 90.
Step 7	end Example: Device(config)# <code>end</code>	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z to exit global configuration mode.

	Command or Action	Purpose
Step 8	wlan <i>wlan_profile_name</i> <i>wlan_ID</i> <i>SSID_network_name</i> band-select Example: Device(config)# wlan wlan1 25 ssid12 Device(config-wlan)# band-select	Configures band selection on specific WLANs. Valid range is between 1 and 512. You can enter up to 32 alphanumeric characters for <i>SSID_network_name</i> parameter.
Step 9	end Example: Device(config)# end	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z to exit global configuration mode.

Configuring the 802.11 Bands (CLI)

Follow the procedure given below to configure 802.11 bands and parameters:

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	ap dot11 5ghz shutdown Example: Device(config)# ap dot11 5ghz shutdown	Disables the 802.11a band. Note You must disable the 802.11a band before configuring the 802.11a network parameters.
Step 3	ap dot11 24ghz shutdown Example: Device(config)# ap dot11 24ghz shutdown	Disables the 802.11b band. Note You must disable the 802.11b band before configuring the 802.11b network parameters.
Step 4	ap dot11 {5ghz 24ghz} beaconperiod <i>time_unit</i> Example: Device(config)# ap dot11 5ghz beaconperiod 500	Specifies the rate at which the SSID is broadcast by the corresponding access point. The beacon interval is measured in time units (TUs). One TU is 1024 microseconds. You can configure the access point to send a beacon every 20 to 1000 milliseconds.
Step 5	ap dot11 {5ghz 24ghz} fragmentation <i>threshold</i> Example: Device(config)# ap dot11 5ghz fragmentation 300	Specifies the size at which packets are fragmented. The threshold is a value between 256 and 2346 bytes (inclusive). Specify a low number for

	Command or Action	Purpose
		areas where communication is poor or where there is a great deal of radio interference.
Step 6	ap dot11 {5ghz 24ghz} dtpc Example: Device (config) # ap dot11 5ghz dtpc Device (config) # no ap dot11 24ghz dtpc	<p>Enables access points to advertise their channels and transmit the power levels in beacons and probe responses.</p> <p>The default value is enabled. Client devices using dynamic transmit power control (DTPC) receive the channel-level and power-level information from the access points and adjust their settings automatically. For example, a client device used primarily in Japan can rely on DTPC to adjust its channel and power settings automatically when it travels to Italy and joins a network there.</p> <p>The no form of the command disables the 802.11a or 802.11b DTPC setting.</p>
Step 7	wireless client association limit <i>number</i> interval <i>milliseconds</i> Example: Device (config) # wireless client association limit 50 interval 1000	<p>Specifies the maximum allowed clients that can be configured.</p> <p>You can configure the maximum number of association requests on a single access point slot at a given interval. The range of association limit that you can configure is from 1 to 100.</p> <p>The association request limit interval is measured between 100 to 10000 milliseconds.</p>
Step 8	ap dot11 {5ghz 24ghz} rate <i>rate</i> {disable mandatory supported} Example: Device (config) # ap dot11 5ghz rate 36 mandatory	<p>Specifies the rate at which data can be transmitted between the controller and the client.</p> <ul style="list-style-type: none"> • <i>disable</i>—Defines that the clients specify the data rates used for communication. • <i>mandatory</i>—Defines that the clients support this data rate in order to associate to an access point on the controller. • <i>supported</i>—Any associated clients that support this data rate can communicate with the access point using that rate. However, the clients are not required to use this rate in order to associate. • <i>rate</i>—Specifies the rate at which data is transmitted. For the 802.11a and 802.11b bands, the data is transmitted at the rate of 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, or 54 Mbps.

	Command or Action	Purpose
Step 9	no ap dot11 5ghz shutdown Example: Device(config)# no ap dot11 5ghz shutdown	Enables the 802.11a band. Note The default value is enabled.
Step 10	no ap dot11 24ghz shutdown Example: Device(config)# no ap dot11 24ghz shutdown	Enables the 802.11b band. Note The default value is enabled.
Step 11	ap dot11 24ghz dot11g Example: Device(config)# ap dot11 24ghz dot11g	Enables or disables 802.11g network support. The default value is enabled. You can use this command only if the 802.11b band is enabled. If you disable this feature, the 802.11b band is enabled without 802.11g support.
Step 12	end Example: Device(config)# end	Returns to privileged EXEC mode.

Configuring 802.11n Parameters (CLI)

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	ap dot11 {5ghz 24ghz} dot11n Example: Device(config)# ap dot11 5ghz dot11n	Enables 802.11n support on the network. The no form of this command disables the 802.11n support on the network.
Step 3	ap dot11 {5ghz 24ghz} dot11n mcs tx <i>rtu</i> Example: Device(config)# ap dot11 5ghz dot11n mcs tx 20	Specifies the modulation and coding scheme (MCS) rates at which data can be transmitted between the access point and the client. <i>rtu</i> -The valid range is between 0 and 23. The no form of this command disables the MCS rates that are configured.
Step 4	wlan <i>wlan_profile_name</i> <i>wlan_ID</i> <i>SSID_network_name</i> wmm require Example:	Enables WMM on the WLAN and uses the 802.11n data rates that you configured.

	Command or Action	Purpose
	<pre>Device(config)# wlan wlan1 25 ssid12 Device(config-wlan)# wmm require</pre>	The require keyword requires client devices to use WMM. Devices that do not support WMM cannot join the WLAN.
Step 5	<p>ap dot11 {5ghz 24ghz} shutdown</p> <p>Example:</p> <pre>Device(config)# ap dot11 5ghz shutdown</pre>	Disables the network.
Step 6	<p>{ap no ap} dot11 {5ghz 24 ghz} dot11n a-mpdu tx priority {all 0-7}</p> <p>Example:</p> <pre>Device(config)# ap dot11 5ghz dot11n a-mpdu tx priority all</pre>	<p>Specifies the aggregation method used for 802.11n packets.</p> <p>Aggregation is the process of grouping packet data frames together, rather than transmitting them separately. Two aggregation methods are available: Aggregated MAC Protocol Data Unit (A-MPDU) and Aggregated MAC Service Data Unit (A-MSDU). Both A-MPDU and A-MSDU are performed in the software.</p> <p>You can specify the aggregation method for various types of traffic from the access point to the clients.</p> <p>The list defines the priority levels (0-7) assigned per traffic type.</p> <ul style="list-style-type: none"> • 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 100-ms latency and jitter • 7—Network control <p>You can configure each priority level independently, or you can use the all the parameters to configure all the priority levels at once. You can configure priority levels so that the traffic uses either A-MPDU transmission or A-MSDU transmission.</p> <ul style="list-style-type: none"> • When you use the ap command along with the other options, the traffic associated with that priority level uses A-MPDU transmission.

	Command or Action	Purpose
		<ul style="list-style-type: none"> When you use the no ap command along with the other options, the traffic associated with that priority level uses A-MSDU transmission. <p>Configure the priority levels to match the aggregation method used by the clients. By default, A-MPDU is enabled for priority level 0, 4, and 5, and the rest are disabled. By default, A-MPDU is enabled for all priorities except 6 and 7.</p>
Step 7	no ap dot11 {5ghz 24ghz} shutdown Example: Device(config)# no ap dot11 5ghz shutdown	Re-enables the network.
Step 8	ap dot11 {5ghz 24ghz} dot11n guard-interval {any long} Example: Device(config)# ap dot11 5ghz dot11n guard-interval long	Configures the guard interval for the network.
Step 9	ap dot11 {5ghz 24ghz} dot11n rifs rx Example: Device(config)# ap dot11 5ghz dot11n rifs rx	Configures the Reduced Interframe Space (RIFS) for the network.
Step 10	end Example: Device(config)# end	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z to exit global configuration mode.

Configuring 802.11h Parameters (CLI)

Procedure

	Command or Action	Purpose
Step 1	ap dot11 5ghz shutdown Example: Device(config)# ap dot11 5ghz shutdown	Disables the 802.11a network.
Step 2	{ap no ap} dot11 5ghz channelswitch mode switch_mode Example:	Enables or disables the access point to announce when it is switching to a new channel. <i>switch_mode</i> --Enter 0 or 1 to specify whether transmissions are restricted until the actual

	Command or Action	Purpose
	Device(config)# ap dot11 5ghz channelswitch mode 0	channel switch (0) or are not restricted (1). The default value is disabled.
Step 3	ap dot11 5ghz power-constraint value Example: Device(config)# ap dot11 5ghz power-constraint 200	Configures the 802.11h power constraint value in dB. The valid range is from 0 to 255. The default value is 3.
Step 4	no ap dot11 5ghz shutdown Example: Device(config)# no ap dot11 5ghz shutdown	Re-enables the 802.11a network.
Step 5	end Example: Device(config)# end	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z to exit global configuration mode.

Monitoring Configuration Settings for Band Selection, 802.11 Bands, and Parameters

Verifying Configuration Settings Using Band Selection and 802.11 Bands Commands

The following commands can be used to verify band selection, 802.11 bands, and parameters on the .

Table 1: Monitoring Configuration Settings Using Band Selection and 802.11 Band Commands

Command	Purpose
show ap dot11 5ghz network	Displays 802.11a band network parameters, 802.11a operational rates, 802.11n MCS settings, and 802.11n status information.
show ap dot11 24ghz network	Displays 802.11b band network parameters, 802.11b/g operational rates, 802.11n MCS settings, and 802.11n status information.
show wireless dot11h	Displays 802.11h configuration parameters.
show wireless band-select	Displays band-select configuration settings.

Example: Viewing the Configuration Settings for the 5-GHz Band

```
Device# 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
```

Example: Viewing the Configuration Settings for the 24-GHz Band

```

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 Admission 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 Codec Type : CODEC_TYPE_G711
  SIP call bandwidth : 64
  SIP call bandwidth sample-size : 20
Video AC
  Video AC - Admission control (ACM) : Disabled
  Video max RF bandwidth : Infinite
  Video reserved roaming bandwidth : 0

```

Example: Viewing the Configuration Settings for the 24-GHz Band

```

Device# show ap dot11 24ghz network
802.11b Network : Enabled
11gSupport : Enabled
11nSupport : Enabled

802.11b/g Operational Rates
802.11b 1M : Mandatory
802.11b 2M : Mandatory
802.11b 5.5M : Mandatory
802.11g 6M : Supported
802.11g 9M : Supported
802.11b 11M : Mandatory
802.11g 12M : Supported
802.11g 18M : Supported
802.11g 24M : Supported
802.11g 36M : Supported
802.11g 48M : Supported
802.11g 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 : 11
Default Tx Power Level : 1
DTPC Status : true
Call Admission Limit : 105
G711 CU Quantum : 15
ED Threshold : -50
Fragmentation Threshold : 2346
PBCC Mandatory : Disabled
Pico-Cell Status : Disabled
Pico-Cell-V2 Status : Disabled
RTS Threshold : 2347
Short Preamble Mandatory : Enabled
Short Retry Limit : 7
Legacy Tx Beamforming setting : Disabled
Traffic Stream Metrics Status : Disabled
Expedited BW Request Status : Disabled
EDCA profile type : default-wmm
Call Admission 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
```

Example: Viewing the status of 802.11h Parameters

```

Voice tspec inactivity timeout : Enabled
CAC SIP-Voice configuration
SIP based CAC : Disabled
SIP Codec Type : CODEC_TYPE_G711
SIP call bandwidth : 64
SIP call bandwidth sample-size : 20
Video AC
Video AC - Admission control (ACM) : Disabled
Video max RF bandwidth : Infinite
Video reserved roaming bandwidth : 0

```

Example: Viewing the status of 802.11h Parameters

```

Device# show wireless dot11h
Power Constraint: 0
Channel Switch: 0
Channel Switch Mode: 0

```

Example: Verifying the Band-Selection Settings

The following example displays a band-select configuration:

```

Device# show wireless band-select

Band Select Probe Response : per WLAN enabling
Cycle Count                : 2
Cycle Threshold (millisec) : 200
Age Out Suppression (sec)  : 20
Age Out Dual Band (sec)    : 60
Client RSSI (dBm)          : -80
Client Mid RSSI (dBm)      : -80

```

Configuration Examples for Band Selection, 802.11 Bands, and Parameters**Examples: Band Selection Configuration**

This example shows how to set the probe cycle count and time threshold for a new scanning cycle period for band select:

```

Device# configure terminal
Device(config)# wireless client band-select cycle-count 3
Device(config)# wireless client band-select cycle-threshold 5000
Device(config)# end

```

This example shows how to set the suppression expiry time to the band select:

```

Device# configure terminal
Device(config)# wireless client band-select expire suppression 100
Device(config)# end

```

This example shows how to set the dual-band expiry time for the band select:

```
Device# configure terminal
Device(config)# wireless client band-select expire dual-band 100
Device(config)# end
```

This example shows how to set the client RSSI threshold for the band select:

```
Device# configure terminal
Device(config)# wireless client band-select client-rssi 40
Device(config)# end
```

This example shows how to configure band selection on specific WLANs:

```
Device# configure terminal
Device(config)# wlan wlan1 25 ssid12
Device(config-wlan)# band-select
Device(config)# end
```

Examples: 802.11 Bands Configuration

This example shows how to configure 802.11 bands using beacon interval, fragmentation, and dynamic transmit power control:

```
Device# configure terminal
Device(config)# ap dot11 5ghz shutdown
Device(config)# ap dot11 24ghz shutdown
Device(config)# ap dot11 5ghz beaconperiod 500
Device(config)# ap dot11 5ghz fragmentation 300
Device(config)# ap dot11 5ghz dtpc
Device(config)# wireless client association limit 50 interval 1000
Device(config)# ap dot11 5ghz rate 36 mandatory
Device(config)# no ap dot11 5ghz shutdown
Device(config)# no ap dot11 24ghz shutdown
Device(config)# ap dot11 24ghz dot11g
Device(config)#end
```

Examples: 802.11n Configuration

This example shows how to configure 802.11n parameters for 5-GHz band using aggregation method:

```
Device# configure terminal
Device(config)# ap dot11 5ghz dot11n
Device(config)# ap dot11 5ghz dot11n mcs tx 20
Device(config)# wlan wlan1 25 ssid12
Device(config-wlan)# wmm require\
Device(config-wlan)# exit
Device(config)# ap dot11 5ghz shutdown
Device(config)# ap dot11 5ghz dot11n a-mpdu tx priority all
Device(config)# no ap dot11 5ghz shutdown
Device(config)#exit
```

This example shows how to configure the guard interval for 5-GHz band:

```

Device# configure terminal
Device(config)# ap dot11 5ghz dot11n
Device(config)# ap dot11 5ghz dot11n mcs tx 20
Device(config)# wlan wlan1 25 ssid12
Device(config-wlan)# wmm require\
Device(config-wlan)# exit
Device(config)# no ap dot11 5ghz shutdown
Device(config)# ap dot11 5ghz dot11n guard-interval long
Device(config)#end

```

This example shows how to configure the RIFS for 5-GHz band:

```

Device# configure terminal
Device(config)# ap dot11 5ghz dot11n
Device(config)# ap dot11 5ghz dot11n mcs tx 20
Device(config)# wlan wlan1 25 ssid12
Device(config-wlan)# wmm require\
Device(config-wlan)# exit
Device(config)# ap dot11 5ghz shutdown
Device(config)# ap dot11 5ghz dot11n rifs rx
Device(config)#end

```

Examples: 802.11h Configuration

This example shows how to configure the access point to announce when it is switching to a new channel using restriction transmission:

```

Device# configure terminal
Device(config)# ap dot11 5ghz shutdown
Device(config)# ap dot11 5ghz channelswitch mode 0
Device(config)# no ap dot11 5ghz shutdown
Device(config)#end

```

This example shows how to configure the 802.11h power constraint for 5-GHz band:

```

Device# configure terminal
Device(config)# ap dot11 5ghz shutdown
Device(config)# ap dot11 5ghz power-constraint 200
Device(config)# no ap dot11 5ghz shutdown
Device(config)#end

```

Additional References for 802.11 Parameters and Band Selection

Related Documents

Related Topic	Document Title
System management commands	<i>System Management Command Reference, Cisco IOS XE Release 3SE (Cisco WLC 5700 Series)</i>

Standards and RFCs

Standard/RFC	Title
None	—

MIBs

MIB	MIBs Link
All the supported MIBs for this release.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/support

Feature History and Information For Performing 802.11 parameters and Band Selection Configuration

Release	Feature Information
Cisco IOS XE 3.2SE	This feature was introduced.

