Configuring 802.11 Parameters

Configuring 802.11n Parameters

Information About Configuring 802.11n Parameters

This section provides instructions for managing 802.11n devices such as the Cisco Aironet 1140 and 3600 Series 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 1040, 1140, 1250, 1260, 3500, and 3600 series access points for WLANs using WMM with no Layer 2 encryption or with WPA2/AES encryption enabled.

Configuring 802.11n Parameters (GUI)

Step 1 Choose **Wireless** > **802.11a/n** or **802.11b/g/n** > **High Throughput (802.11n)** to open the 802.11n (5 GHz or 2.4 GHz) High Throughput page.

Step 2 Select the **11n Mode** check box to enable 802.11n support on the network. The default value is enabled.

Step 3 Select the check boxes of the desired rates to specify the modulation and coding scheme (MCS) rates at which data can be transmitted between the access point and the client. These data rates, which are calculated for a 20-MHz channel width using a short guard interval, are available:

- 0 (7 Mbps)
- 1 (14 Mbps)
- 2 (21 Mbps)
- 3 (29 Mbps)
- 4 (43 Mbps)

- 5 (58 Mbps)

- 6 (65 Mbps)

- 7 (72 Mbps)

- 8 (14 Mbps)

- 9 (29 Mbps)

- 10 (43 Mbps)

- 11 (58 Mbps)

- 12 (87 Mbps)

- 13 (116 Mbps)

- 14 (130 Mbps)

- 15 (144 Mbps)

Any associated clients that support the selected rates may communicate with the access point using those rates. However, the clients are not required to be able to use this rate in order to associate. The MCS settings determine the number of spatial streams, the modulation, the coding rate, and the data rate values that are used.

Step 4   Click **Apply**.

Step 5   Use the 802.11n data rates that you configured by enabling WMM on the WLAN as follows:

a) Choose **WLANs** to open the WLANs page.

b) Click the ID number of the WLAN for which you want to configure WMM mode.

c) When the WLANs > Edit page appears, choose the **QoS** tab to open the WLANs > Edit (Qos) page.

d) From the WMM Policy drop-down list, choose **Required** or **Allowed** to require or allow client devices to use WMM. Devices that do not support WMM cannot join the WLAN.
If you choose **Allowed**, devices that cannot support WMM can join the WLAN but will not benefit from the 802.11n rates.

e) Click **Apply**.

Step 6   Click **Save Configuration**.
Note   To determine if an access point supports 802.11n, look at the 11n Supported text box on either the 802.11a/n (or 802.11b/g/n) Cisco APs > Configure page or the 802.11a/n (or 802.11b/g/n) AP Interfaces > Details page.

Configuring 802.11n Parameters (CLI)

Step 1   Enable 802.11n support on the network by entering this command:
config {802.11a | 802.11b} 11nsupport {enable | disable}

Step 2   Specify the modulation and coding scheme (MCS) rates at which data can be transmitted between the access point and the client by entering this command:
config {802.11a | 802.11b} 11nsupport mcs tx {0-15} {enable | disable}

Step 3   Use the 802.11n data rates that you configured by enabling WMM on the WLAN as follows:
config wlan wmm {**allow** | **disable** | **require**} *wlan_id*

The **require** parameter requires client devices to use WMM. Devices that do not support WMM cannot join the WLAN.

If set to **allow**, devices that cannot support WMM can join the WLAN but do not benefit from 802.11n rates.

Step 4   Specify the aggregation method used for 802.11n packets as follows:

a)   Disable the network by entering this command:
config {**802.11a** | **802.11b**} **disable network**

b)   Specify the aggregation method entering this command:
config {**802.11a** | **802.11b**} **11nsupport** {**a-mpdu** | **a-msdu**} **tx priority** {**0-7** | **all**} {**enable** | **disable**}

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). A-MSDU is performed in hardware and therefore is the default method.

You can specify the aggregation method for various types of traffic from the access point to the clients. The table below defines the priority levels (0-7) assigned per traffic type.

Table 1: Traffic Type Priority Levels

User Priority	Traffic Type
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

You can configure each priority level independently, or you can use the **all** parameter to configure all of the priority levels at once. When you use the **enable** command, the traffic associated with that priority level uses A-MPDU transmission. When you use the **disable** command, the traffic associated with that priority level uses A-MSDU transmission. 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-MSDU is enabled for all priorities except 6 and 7.

c)   Reenable the network by entering this command:
config {**802.11a** | **802.11b**} **enable network**

Step 5   Configure the 802.11n-5 GHz A-MPDU transmit aggregation scheduler by entering this command:

        config 802.11{**a** | **b**} **11nsupport a-mpdu tx scheduler** {**enable** | **disable** | **timeout rt** *timeout-value*}

        The timeout value is in milliseconds. The valid range is between 1 millisecond to 1000 milliseconds.

Step 6   Configure the guard interval for the network by entering this command:
        config 802.11{**a** | **b**} **11nsupport guard-interval** {**any** | **long**}

Step 7   Configure the Reduced Interframe Space (RIFS) for the network by entering this command:
        config 802.11{**a** | **b**} **11nsupport rifs rx** {**enable** | **disable**}

Step 8   Enter the **save config** command.

Step 9   View the configuration settings for the 802.11a/n or 802.11b/g/n band by entering this command:
        show {**802.11a** | **802.11b**}

Configuring 802.11h Parameters

Information About Configuring 802.11h Parameters

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

Configuring 802.11h Parameters (GUI)

Step 1   Disable the 802.11a band as follows:

      a) Choose **Wireless > 802.11a/n > Network** to open the 802.11a Global Parameters page.

      b) Unselect the **802.11a Network Status** check box.

      c) Click **Apply** to commit your change.

Step 2   Choose **Wireless > 802.11a/n > DFS (802.11h)** to open the 802.11h Global Parameters page.

Step 3   In the Power Constraint area, enter the local power constraint. The valid range is between 0 dBm and 30 dBm.

Step 4   In the Channel Switch Announcement area, select the **Channel Announcement** check box if you want the access point to announce when it is switching to a new channel and the new channel number, or unselect this check box to disable the channel announcement. The default value is disabled.

Step 5   If you enabled the channel announcement, the **Channel Quiet Mode** check box appears. Select this check box if you want the access point to stop transmitting on the current channel, or unselect this check box to disable quiet mode. The default value is disabled.

Step 6   Click **Apply** to commit your changes.

Step 7   Reenable the 802.11a band as follows:

      a) Choose **Wireless > 802.11a/n > Network** to open the 802.11a Global Parameters page.

      b) Select the **802.11a Network Status** check box.

c) Click **Apply** to commit your change.

Step 8   Click **Save Configuration** to save your changes.

Configuring 802.11h Parameters (CLI)

Step 1   Disable the 802.11a network by entering this command:
config 802.11a disable network

Step 2   Enable or disable the access point to announce when it is switching to a new channel and the new channel number by entering this command:
config 802.11h channelswitch {**enable** | **disable**} *switch_mode*

You can enter a 0 or 1 for the *switch_mode parameter to* specify whether transmissions are restricted until the actual channel switch (0) or are not restricted (1). The default value is disabled.

Step 3   Configure a new channel using the 802.11h channel announcement by entering this command:
config 802.11h setchannel channel *channel*

Step 4   Configure the 802.11h power constraint value by entering this command:
config 802.11h powerconstraint *value*

Use increments of 3 dB for the value so that the AP goes down one power level at a time.

Step 5   Reenable the 802.11a network by entering this command:
config 802.11a enable network

Step 6   See the status of 802.11h parameters by entering this command:
show 802.11h

Information similar to the following appears:

```
Power Constraint.................................. 0
Channel Switch.................................... Disabled
Channel Switch Mode.............................. 0
```