



# Support for CAPWAP and WGB Modes on the Cisco Wi-Fi Interface Module

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## Support for CAPWAP and WGB Modes on the Cisco Wi-Fi Interface Module

The Cisco Wi-Fi Interface Module (WIM) is a pluggable interface module available for all models of the IR1800 series. The Product Identifier (PID) is WP-WIFI6-x where x signifies the regulatory domain. For more information about WIM, see [Cisco Wi-Fi Interface Module \(WIM\) Configuration Guide](#).

Cisco IOS XE Release 17.14.1 supports:

1. Switch operation mode between Control and Provisioning of Wireless Access Points (CAPWAP) and Workgroup Bridge (WGB).
2. Factory reset and erase configuration.
3. Configure the radios for WGB uplink and concurrent Root AP mode operations.

The following table summarises the management support for Wi-Fi Module operations in IR1800:

Modes	WIM IOS XE Release	Router IOSXE Release	Support
Control and Provisioning of Wireless Access Points (CAPWAP) Mode	17.11.0.155 and later	17.13.1 and later	Cisco Wireless LAN Controller.
Embedded Wireless Controller (EWC) Mode	17.11.0.155 and later	17.13.1 and later	IOX XE CLI vManage (SDWAN controller mode).
Work Group Bridge (WGB) Mode	17.11.0.155 and later	17.13.1	Cisco IoT Operations Dashboard.
		17.14.1	Cisco IoT Operations Dashboard. IOX XE CLI vManage (SDWAN and SD-Routing modes).

### Management Support for Cisco WIM in CAPWAP Mode

- When operating in CAPWAP mode, the module functions as an Access Point managed by an external Cisco IOS XE Wireless LAN Controller, acquiring an IP address through DHCP and discovering the controller using Layer 3, DHCP, DNS, or IP subnet broadcast.
- Configuration of DHCP server and Switch Virtual Interface (SVI) on the router for WIM is required for the CAPWAP mode for WIM to discover and communicate with Wireless LAN controller.



**Note** The mode change from CAPWAP mode to WGB mode is supported only when the module is in its factory default configuration.

See [Control And Provisioning of Wireless Access Points \(CAPWAP\)](#) for more information.

### Management Support for Cisco WIM in EWC Mode

- The Wi-Fi module acts as a Cisco IOS XE Wireless LAN Controller in Embedded Wireless Controller (EWC) mode, supporting configuration from IOS XE release 17.13.1.



**Note** The Wi-Fi module in EWC mode does not support changing to CAPWAP or WGB mode.

See [Wireless LAN Controller](#) for more details.

See [EWC Mode](#) for more details.

### Management Support for Cisco WIM in WGB Mode

The following section describes the new configuration options available on IR1800 for Deploying Cisco Wi-Fi Interface Module in WGB mode.

## Configuring IR1800 for deploying WGB

The following section show how to configure IR1800 for deploying WGB:

### Configuring a QoS Profile

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b>  router# <b>enable</b>	Enables privileged EXEC mode.
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b>  router# <b>configure terminal</b>	Enters global configuration mode.

	Command or Action	Purpose
<b>Step 3</b>	<b>wireless-bridge submode</b> <b>Example:</b>  router(config) # <b>wireless-bridge</b>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>qos-profile qos-profile-name {bronze   gold   platinum   silver }</b> <b>Example:</b>  router(config-wl-bridge) # <b>qos-profile test-qos-profile bronze</b>	Create a QoS profile with one of the levels of QoS policy.
<b>Step 5</b>	<b>End</b> <b>Example:</b>  router(config-wl-bridge) # <b>end</b>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring an SSID Profile With Open Authentication Without a QoS Profile Mapped

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b>  router# <b>enable</b>	Enters privileged EXEC mode.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b>  router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 3</b>	<b>wireless-bridge submode</b> <b>Example:</b>  router(config) # <b>wireless-bridge</b>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>ssid-profile ssid-profile-name ssid ssid-name   authentication open</b> <b>Example:</b>  router(config-wl-bridge) # <b>ssid-profile</b>	Create SSID profile with open authentication.

	Command or Action	Purpose
	<code>test-ssid-profile ssid test-ssid authentication open</code>	
<b>Step 5</b>	End <b>Example:</b> <code>router(config-wl-bridge)# end</code>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring an SSID Profile With Open Authentication With a QoS Profile Mapped

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<code>enable</code> <b>Example:</b> <code>router# enable</code>	Enters privileged EXEC mode.
<b>Step 2</b>	<code>configure terminal</code> <b>Example:</b> <code>router# configure terminal</code>	Enters global configuration mode.
<b>Step 3</b>	<code>wireless-bridge submenu</code> <b>Example:</b> <code>router(config)# wireless-bridge</code>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<code>ssid-profile ssid-profile-name ssid ssid-name qos-profile qos-profile-name authentication open</code> <b>Example:</b> <code>router(config-wl-bridge)# ssid-profile test-ssid-profile ssid test-ssid qos-profile test-qos-profile authentication open</code>	Create SSID profile with open authentication with a QoS-profile mapped.
<b>Step 5</b>	End <b>Example:</b> <code>router(config-wl-bridge)# end</code>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring an SSID Profile with WPA2 Personal Authentication Without a QoS Profile Mapped

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>router# enable</pre>	Enters privileged EXEC mode.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> <pre>router# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b>	<b>wireless-bridge submode</b> <b>Example:</b> <pre>router(config)# wireless-bridge</pre>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>ssid-profile <i>ssid-profile-name</i> ssid <i>ssid-name</i> authentication psk key-management wpa2 secret-key {0   6   7 } <i>secret-key</i></b> <b>Example:</b> <pre>router(config-wl-bridge)# ssid-profile test-ssid-profile ssid test-ssid authentication psk key-management wpa2 secret-key 0 testkey123!</pre>	Create SSID profile with PSK authentication. <ul style="list-style-type: none"> <li>• 0: Specifies an unencrypted secret key will follow.</li> <li>• 6: Specifies an encrypted secret key will follow.</li> <li>• 7: Specifies a hidden secret key will follow.</li> </ul>
<b>Step 5</b>	<b>End</b> <b>Example:</b> <pre>router(config-wl-bridge)# end</pre>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring an SSID Profile with WPA2 Personal Authentication With a QoS Profile Mapped

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b>	Enters privileged EXEC mode.

	Command or Action	Purpose
	<code>router# enable</code>	
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> <code>router# configure terminal</code>	Enters global configuration mode.
<b>Step 3</b>	<b>wireless-bridge submenu</b> <b>Example:</b> <code>router(config)# wireless-bridge</code>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>ssid-profile ssid-profile-name ssid ssid-name qos-profile qos-profile-name authentication psk key-management wpa2 secret-key {0   6   7 } secret-key</b> <b>Example:</b> <code>router(config-wl-bridge)# ssid-profile test-ssid-profile ssid test-ssid qos-profile qos-profile-test authentication psk key-management wpa2 secret-key 0 testkey123!</code>	Create SSID profile with PSK authentication with QoS profile mapped. <ul style="list-style-type: none"> <li>• 0: Specifies an unencrypted secret key will follow.</li> <li>• 6: Specifies an encrypted secret key will follow.</li> <li>• 7: Specifies a hidden secret key will follow.</li> </ul>
<b>Step 5</b>	End <b>Example:</b> <code>router(config-wl-bridge)# end</code>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring a Dot11radio in WGB Mode and Configuring Various Parameters

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <code>router# enable</code>	Enters privileged EXEC mode.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b>	Enters global configuration mode.

	Command or Action	Purpose
	<code>router# configure terminal</code>	
<b>Step 3</b>	<b>wireless-bridge submode</b> <b>Example:</b> <code>router(config)# wireless-bridge</code>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>dot11radio {0 1} mode {wgb } ssid-profile ssid-profile name</b> <b>Example:</b> <code>router(config-wl-bridge)# dot11radio 1 mode wgb ssid-profile test-ssid-profile</code>	Configure a Dot11Radio as WGB.
<b>Step 5</b>	<b>dot11radio {0 1} {enable   disable }</b> <b>Example:</b> <code>router(config-wl-bridge)# dot11radio 1 enable</code>	Enabling Dot11Radio.
<b>Step 6</b>	<b>dot11radio {0 1} channel channel number channel-width</b> <b>Example:</b> <code>router(config-wl-bridge)# dot11radio 1 channel 40 40</code>	Configure a Dot11Radio channel details.
<b>Step 7</b>	End <b>Example:</b> <code>router(config-wl-bridge)# end</code>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring a Dot11Radio in uWGB Mode and Configuring Various Parameters

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <code>router# enable</code>	Enables privileged EXEC mode.

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 3</b>	<b>wireless-bridge submode</b> <b>Example:</b> router(config)# <b>wireless-bridge</b>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>dot11radio {0 1} mode {uwgb } H.H.H</b> <b>ssid-profile ssid-profile name</b> <b>Example:</b>  router(config-wl-bridge)# <b>dot11radio 1</b> <b>mode uwgb E462.C49F.9AA0 ssid-profile</b> <b>test-ssid-profile</b>	Configure a Dot11Radio as uWGB.
<b>Step 5</b>	<b>dot11radio {0 1} {enable   disable }</b> <b>Example:</b> router(config-wl-bridge)# <b>dot11radio 1</b> <b>enable</b>	Enabling Dot11Radio.
<b>Step 6</b>	<b>dot11radio {0 1} channel channel number</b> <b>channel-width</b> <b>Example:</b> router(config-wl-bridge)# <b>dot11radio 1</b> <b>channel 40 40</b>	Configure a Dot11Radio channel details.
<b>Step 7</b>	<b>End</b> <b>Example:</b> router(config-wl-bridge)# <b>end</b>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

## Configuring a Dot11radio in Root AP Mode and Configuring Various Parameters

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> router# <b>enable</b>	Enables privileged EXEC mode.



	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 3</b>	<b>wireless-bridge submode</b> <b>Example:</b> router(config)# <b>wireless-bridge</b>	Enters wireless-bridge configuration mode.
<b>Step 4</b>	<b>dot11radio {0 1} mode {root-ap}</b> <b>Example:</b> router(config-wl-bridge)# <b>dot11radio 0 mode root-ap</b>	Configure a Dot11Radio as Root AP.  The Root AP places the bridge in access point mode. In this mode, the bridge emulates a Cisco Aironet 1100 Series Access Point and accepts associations from client devices.
<b>Step 5</b>	<b>dot11radio {0 1} {enable   disable }</b> <b>Example:</b> router(config-wl-bridge)# <b>dot11radio 0 enable</b>	Enabling Dot11Radio.
<b>Step 6</b>	<b>dot11radio {0 1} wlan wlan-profile-name wlan-id (2-16) vlan vlan-id (2-4094)</b> <b>Example:</b> router(config-wl-bridge)# <b>dot11radio 0 wlan test-wlan-profile 4 vlan 400</b>	Map a WLAN profile to the Dot11Radio in Root AP mode.
<b>Step 7</b>	<b>dot11radio {0 1} channel channel number channel-width</b> <b>Example:</b> router(config-wl-bridge)# <b>dot11radio 0 channel 5 20</b>	Configure a Dot11Radio channel details.
<b>Step 8</b>	<b>End</b> <b>Example:</b>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

	Command or Action	Purpose
	router(config-wl-bridge)# end	<p><b>Note</b></p> <ol style="list-style-type: none"> <li>1. The above command bridges VLAN creation in the client serving radio to wired0, forwarding wireless client traffic directly to the router.</li> <li>2. WLAN IDs range from 2 to 16 (supporting a maximum of 15 WLANs). Configurations related to the Root AP will take effect only after toggling the Root AP radio.</li> <li>3. Enabling Broadcast tagging in WGB will prevent the Root AP from supporting wireless client connections. Broadcast tagging configuration is disabled by default.</li> </ol>

## Verifying the WGB Mode Configuration, Monitoring Operational Status

Use the following commands to verify the configuration status:

**Command:** show run-config | sec wireless-bridge

**Example:**

```
router#show run-config | sec wireless-bridge
```

Use the following commands for monitoring the operational status:

**Command:** show wireless-bridge status

**Example:**

```
router#show wireless-bridge status
Module Operating Mode : WGB mode
Module Status        : Module State Ready
Software Version     : 17.11.0.155
Module Session Status : Login Success
```

**Command:** show wireless-bridge wlans

**Example:**

```
router#show wireless-bridge wlans
wlan  band  oper  vlan  #client  wlan-mode  SSID
----  ----  ---  ----  -
   2   2.4g   up    2      1   downlink  myssid
```

**Command:** show wireless-bridge clients

**Example:**

```
router#show wireless-bridge clients
Client-MAC-Addr  band  status      wlan  DeviceType  SSID
-----
40:ED:00:1C:85:3B 2.4g  Associated   2    wireless   myssid
00:0C:29:5E:7D:A9 N/A   Associated   N/A   wired      N/A
00:0C:29:4A:95:9C N/A   Associated   N/A   wired      N/A
00:0C:29:5E:7D:A9 N/A   Associated   N/A   wired      N/A
```

For additional information about WGB and Universal Workgroup Bridge (uWGB) configuration, refer the following documents:

- [Workgroup Bridge \(WGB\)](#)
- [Cisco Industrial Wireless Workgroup Bridge and Universal WGB Deployment Guide](#)

## Additional Commands

### Configuring Static IP address

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> router# <b>enable</b>	Enables privileged EXEC mode.
Step 2	<b>configure terminal</b> <b>Example:</b> router# <b>configure terminal</b>	Enters global configuration mode.
Step 3	<b>wireless-bridge</b> <b>Example:</b> router(config)# <b>wireless-bridge</b>	Enters wireless-bridge configuration mode.
Step 4	<b>wgb address ipv4 static ipaddress netmask gateway</b> <b>Example:</b> router(config-wl-bridge)# <b>wgb address ipv4 static 10.10.10.2 255.255.255.0 10.10.10.1</b>	Configure static ip address along with the netmask and the default gateway.
Step 5	<b>End</b> <b>Example:</b> router(config-wl-bridge)# <b>end</b>	Exits wireless-bridge configuration mode and returns to privilege EXEC mode.

### Clear Configuration

To clear the configuration on the Wi-Fi module, use the following command:

```
router# wireless-bridge erase
```

### Factory Reset

To perform a factory reset on the module, use the following command:

```
router# wireless-bridge factory reset config/default
```

### Mode Conversion

To change the operating mode of the module between WGB and CAPWAP modes, use the following command:

```
router# wireless-bridge boot mode capwap/wgb
```

## Firmware Upgrade

Firmware upgrade is supported from Unified Client Image version 17.11 and above when running in WGB mode. To upgrade the firmware, the IR1800 requires the TFTP server to be enabled for the module to obtain the image.

The firmware upgrade process takes about 5-6 minutes to complete. Upon successful upgrade, the Wi-Fi module is automatically reloaded with the new image.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>router# enable</pre>	Enters privileged EXEC mode.
<b>Step 2</b>	<b>copy</b> <b>rep://local-server/ap1g8t-k9c1-tar-k9c1-tar</b> <b>Example:</b> <pre>router# copy rep://netadmin@172.16.101.101/ap1g8t-k9c1-tar bootflash:ap1g8t-k9c1-tar</pre>	Copy the unified client image(ap1g8t-k9c1-tar) to IR1800. The image will be downloaded to the module from this location.
<b>Step 3</b>	<b>configure terminal</b> <b>Example:</b> <pre>router# configure terminal</pre>	Enters global configuration mode.
<b>Step 4</b>	<b>tftp-server directory:image</b> <b>Example:</b> <pre>router# tftp-server bootflash:ap1g8t-k9c1-tar router# end</pre>	Configure the image location on the TFTP Server of IR1800 and exit from global configuration mode.
<b>Step 5</b>	<b>wireless-bridge firmware-upgrade</b> <b>ap1g8t-k9c1-tar ip netmask gateway</b> <b>Example:</b> <pre>router(config)# wireless-bridge firmware-upgrade ap1g8t-k9c1-tar 10.10.10.1 255.255.255.0 10.10.10.1</pre>	Start Firmware upgrade.
<b>Step 6</b>	<b>more bootflash:/od_status</b>	Firmware upgrade takes about 5 to 6 minutes to complete. Check the <b>od_status</b> logs to monitor the progress.