



Wireless Management on Cisco 1000 Series Integrated Services Routers

Table 1: Feature History

Feature Name	Release Information	Description
Wireless Management on Cisco ISR 1000 Series Routers (supporting WiFi 5 WLAN module)	Cisco IOS XE Catalyst SD-WAN Release 17.6.1a Cisco vManage Release 20.6.1	<p>This feature enables you to configure wireless LAN settings on WiFi 5-capable Cisco 1000 Series Integrated Services Routers using Cisco SD-WAN Manager.</p> <p>With Cisco SD-WAN Manager, you can automate the wireless LAN controller configuration and provide wireless connectivity without the need for another external controller to configure and manage the wireless settings on the routers.</p>
Wireless Management on Cisco ISR 1000 Series Routers (supporting WiFi 6 WLAN module)	Cisco IOS XE Catalyst SD-WAN Release 17.9.1a Cisco vManage Release 20.9.1	<p>This feature enables you to configure wireless LAN settings on WiFi 6-capable Cisco 1000 Series Integrated Services Routers using Cisco SD-WAN Manager.</p> <p>The Embedded Wireless Controller on Cisco 1000 Series Integrated Services Routers helps you provide wireless connectivity without the need for another external controller to configure and manage the wireless settings on the routers.</p>

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Supported Devices for Wireless Management on Cisco ISR 1000 Series Routers

The following table displays a list of Cisco ISR 1000 Series routers that include the WLAN module and supporting WiFi 5.

Table 2: Cisco ISR 1000 Series Routers

Device Family	Device Name	Release Version
Cisco ISR 1000 Series Routers with WLAN module supporting WiFi 5	<ul style="list-style-type: none"> • C1101-4PLTEPW • C1109-4PLTE2PW • C1111-4PW • C1111-8PLTEEA • C1111-8PW • C1112-8PLTEEA • C1112-8PW • C1113-8PLTEEA • C1113-8PMW • C1113-8PW • C1116-4PLTEEA • C1116-4PW • C1117-4PLTEEA • C1117-4PLTELA • C1117-4PMLTEEA • C1117-4PMW • C1117-4PW • C1121-8PLTEPW • C1121X-8PLTEPW 	Cisco IOS XE Catalyst SD-WAN Release 17.6.1a Cisco vManage Release 20.6.1
Cisco ISR 1000 Series Routers with WLAN module supporting WiFi 6	<ul style="list-style-type: none"> • C1131X-8PLTEPW • C1131-8PLTEPW • C1131X-8PW • C1131-8PW 	Cisco IOS XE Catalyst SD-WAN Release 17.9.1a Cisco vManage Release 20.9.1

Prerequisites for Wireless Management on Cisco ISR 1000 Series Routers

- Add the management interface of the Wireless LAN (WLAN) module to a specific VLAN in order to access servers such as DHCP and RADIUS.

- Configure a DHCP server to assign the IP address for the access point.
- Configure a switch virtual interface (SVI) on the Cisco ISR 1000 Services Router for virtual WLAN controller management.

Restrictions for Wireless Management on Cisco ISR 1000 Series Routers

- You can configure only one access point on the LAN side of the router that is configured with Cisco Mobility Express. However, you can connect other external access points to the router that are not configured with Cisco Mobility Express.
- Ensure that there are no other accessible wireless controllers on the LAN side.

Information About Wireless Management on Cisco ISR 1000 Series Routers

A WLAN module supporting WiFi 5 is provisioned on a Cisco ISR 1000 Series Routers for wireless connectivity. Cisco Mobility Express, a virtual wireless LAN controller, is installed in the WLAN module to provide wireless LAN access. The wireless settings for wireless LAN access are available on Cisco Mobility Express, and these settings can be configured and managed using Cisco SD-WAN Manager.

C1131 Cisco IOS XE Catalyst SD-WAN devices includes an Embedded Wireless Controller (EWC) that supports WiFi 6. The EWC also serves as a virtual wireless controller that is installed on the WLAN module. The wireless settings for wireless LAN access are available on the EWC; these settings can be configured and managed using Cisco SD-WAN Manager.

Configure Wireless Management on Cisco ISR 1000 Series Routers Using a Configuration Group

Before you begin

On the **Configuration > Configuration Groups** page, choose **SD-WAN** as the solution type.

Procedure

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- Step 1** From the Cisco SD-WAN Manager menu, choose **Configuration > Configuration Groups**.
- Step 2** Create and configure a Wireless LAN feature in Service profile.
- a) Configure the basic details for the wireless LAN.

Field	Description
Enable 2.4G*	Disable this option to shut down the radio type of 2.4 GHz. Default: Enabled
Enable 5G*	Disable this option to shut down the radio type of 5 GHz. Default: Enabled
Country*	Choose the country where the router is installed.
Username*	Specify the username of Cisco Mobility Express.
Password*	Specify the password of Cisco Mobility Express.

b) Configure ME IP address.

Field	Description
ME Dynamic IP*	Enable this option so that the interface receives its IP address dynamically from a DHCP server.
ME IP Address	Specify the IP address of Cisco Mobility Express.
Subnet Mask	Specify the subnet mask of Cisco Mobility Express.
Default Gateway	Specify the default gateway address of Cisco Mobility Express.

c) Configure the Wi-Fi SSID details for setting up a wireless LAN.

Field	Description
Add SSID	
SSID Name*	Enter a name for the wireless SSID. It can be a string from 4 to 32 characters. The SSID must be unique.
Admin State*	Enable this option to indicate that the interface has been configured.
Broadcast SSID*	Enable this option if you want to broadcast the SSID. Disable this option if you do not want the SSID to be visible to all the wireless clients.
VLAN (Range 1-4094)*	Enter a VLAN ID for the wireless LAN traffic.
Radio Type	Choose one of the following radio types: <ul style="list-style-type: none"> • 2.4GHz • 5GHz • All

Field	Description
Security Type*	Choose a security type: <ul style="list-style-type: none"> • WPA2 Enterprise: Choose this option for an enterprise where you authenticate and authorize network users with a remote RADIUS server. • WPA2 Personal: Choose this option to authenticate users who want to access the wireless network using a passphrase. • Open: Choose this option to allow access to the wireless network without authentication.
Passphrase*	This field is available if you choose WPA2 Personal as the security type. Set a pass phrase. This pass phrase provides users access to the wireless network.
QoS Profile	Choose a QoS profile.

What to do next

Also see [Deploy a Configuration Group](#).

Configure Wireless Management on Cisco ISR 1000 Series Routers

To configure and manage wireless settings on Cisco ISR 1000 Series Routers:

1. From the Cisco SD-WAN Manager menu, choose **Configuration > Templates**.
2. Click **Feature Templates**.
3. Click **Add Template** to select an appropriate device model.



Note In Cisco vManage Release 20.7.x and earlier releases, **Feature Templates** is titled as **Feature**.

4. In the left pane, from **Select Devices**, choose a Cisco ISR 1000 Series Router for which you are creating a template.
5. Under **OTHER TEMPLATES**, click **ISR1K Wireless** to select it as the feature template.
6. In the **Template Name** field, enter a name for the feature template.
This field is mandatory and can contain only uppercase and lowercase letters, the digits 0 to 9, hyphens (-), and underscores (_). It cannot contain spaces or any other characters.
7. In the **Description** field, enter a description for the feature template.
This field is mandatory, and it can contain all characters and spaces.

8. Enter the Wi-Fi SSID details for setting up a wireless LAN:

Parameter Name	Description
Wireless Network Name (SSID)	Enter a name for the wireless SSID. It can be a string from 4 to 32 characters. The SSID must be unique.
VLAN (Range 1-4094)	Enter a VLAN ID for the wireless LAN traffic.
Security Type	Choose a security type: <ul style="list-style-type: none"> • WPA2 Enterprise: Choose this option for an enterprise where you authenticate and authorize network users with a remote RADIUS server. • WPA2 Personal: Choose this option to authenticate users who want to access the wireless network using a passphrase. • Open: Choose this option to allow access to the wireless network without authentication.
RADIUS Server IP	(Optional) This field is available if you choose the WPA2 Enterprise option as the security type. Enter the IP address of the RADIUS server.
Authentication Port	(Optional) This field is available if you choose the WPA2 Enterprise option as the security type. Enter the authentication port number of the RADIUS server.
Shared Secret	(Optional) This field is available if you choose the WPA2 Enterprise option as the security type. Enter the shared secret key of the RADIUS server.
Passphrase	(Optional) This field is available if you choose the WPA2 Personal option as the security type. Set a pass phrase. This pass phrase provides users with access to the wireless network.
Admin State	Choose an admin state.
Radio Type	Choose one of the following radio types: <ul style="list-style-type: none"> • 2.4GHz • 5GHz • Both
Broadcast SSID	Choose On to broadcast the SSID. Choose Off if you do not want the SSID to be visible to all the wireless clients.

Parameter Name	Description
QoS Profile	Choose a QoS profile.

9. Enter the **General** details for the wireless LAN:

Parameter Name	Description
Country	Choose the country where the ISR is installed.
Username	Specify the username of Cisco Mobility Express. If you are using a C1131 Cisco IOS XE Catalyst SD-WAN device specify the username for the EWC.
Password	Specify the password for Cisco Mobility Express or the EWC.

10. Enter the **Advanced** details for the wireless LAN:

Parameter Name	Description
Controller IP Address	Note For Cisco IOS XE Catalyst SD-WAN Release 17.6.1a, and Cisco vManage Release 20.6.1 and earlier releases, this field is displayed as ME IP Address . Specify the Management IP address of Cisco Mobility Express or EWC.
Subnet Mask	Specify the subnet mask for the Management IP address.
Default Gateway	Specify the default gateway address of Cisco Mobility Express or EWC.
2.4GHz Shutdown	Click Yes to shut down the 2.4 GHz radio type. Click No to not shut down this radio type.
5GHz Shutdown	Click Yes to shut down the 5 GHz radio type. Click No to not shut down this radio type.

11. Click **Save** to save your wireless configuration.

Configure Wireless Management on Cisco ISR 1000 Series Routers Using a CLI Template

This section provides sample CLI configurations to configure and manage wireless settings on Cisco ISR 1000 Series Routers using the CLI templates.

Configure Radio Profile Using a CLI Template

For more information about using CLI templates, see [CLI Add-On Feature Templates](#) and [CLI Templates](#).



Note By default, CLI templates execute commands in global config mode.

```
radio-profile 24ghz
shutdown
exit
radio-profile 5ghz
no shutdown
```

Configure WLAN Profile Using a CLI Template

For more information about using CLI templates, see [CLI Add-On Feature Templates](#) and [CLI Templates](#).



Note By default, CLI templates execute commands in global config mode.

```
wlan-profile wlan-profile-sample-1
vlan-id 100
ssid sample-ssid-1
data-security personal
passphrase 0 Pass-Phrase-Sample123#
qos-type silver
wlan-profile wlan-profile-sample-2
vlan-id 200
ssid sample-ssid-2
data-security enterprise
aaa radius-server 10.2.3.4 auth-port 1812 shared-secret 0 EsrdT_23sss

qos-type gold
nobroadcast-ssid
```

Configure General WLAN Settings Using a CLI Template

For more information about using CLI templates, see [CLI Add-On Feature Templates](#) and [CLI Templates](#).



Note By default, CLI templates execute commands in global config mode.

```
wireless-lan country US
wireless-lan mgmt ip address 10.16.1.100 255.255.255.0 default-gateway 192.168.1.1
wireless-lan mgmt credential username admin password 0 sRe32dfst#asd
```

Here is the complete configuration example that shows that show how to configure and manage wireless settings on Cisco ISR 1000 Series Routers.

```
wlan-profile TEST-Enterprise
radio-band all
vlan-id 300
ssid TEST-Enterprise
data-security enterprise
aaa radius-server 192.168.100.20 auth-port 1812 shared-secret 6 EsrdT_23sss
qos-type silver
```

```
wlan-profile TEST-Personal
radio-band all
ssid TEST-Personal
data-security personal
passphrase 0 IdSvs23452#
qos-type silver
```

```
radio-profile 24ghz
channel auto
channel-bandwidth auto
```

```
radio-profile 5ghz
channel auto
channel-bandwidth auto
```

```
wireless-lan mgmt ip address 192.168.1.11 255.255.255.0 default-gateway 192.168.1.1
wireless-lan mgmt credential username admin password 6 sRe32dfst#asd
wireless-lan country US
```

Monitor Wireless Configuration on Cisco ISR 1000 Series Routers

To monitor the wireless settings that are configured on Cisco ISR 1000 Series Routers using Cisco SD-WAN Manager, perform this procedure :

1. From the Cisco SD-WAN Manager menu, navigate to **Monitor > Network**.
2. Choose a router from the list of the routers.
3. Click **Real Time** in the left pane.
4. From the **Device Options** drop-down list, choose one of the following options:

Device Option	Description
Wireless Radio	Displays the radio parameters of the wireless LAN.
Wireless SSID	Displays information about the wireless SSID.

Device Option	Description
Wireless Clients	Displays information about the wireless clients in the wireless LAN.

Configuration Example for Wireless Configuration on Cisco ISR 1000 Series Routers

The following is an example of wireless configuration of a Cisco ISR 1000 Series Routers:

```
wlan-profile TEST-Enterprise
radio-band all
vlan-id 300
ssid TEST-Enterprise
data-security enterprise
aaa radius-server 192.168.100.20 auth-port 1812 shared-secret 6 EsrdT_23sss
qos-type silver
```

```
wlan-profile TEST-Personal
radio-band all
ssid TEST-Personal
data-security personal
passphrase 0 IdSvs23452#
qos-type silver
```

```
radio-profile 24ghz
channel auto
channel-bandwidth auto
```

```
radio-profile 5ghz
channel auto
channel-bandwidth auto
```

```
wireless-lan mgmt ip address 192.168.1.11 255.255.255.0 default-gateway 192.168.1.1
wireless-lan mgmt credential username admin password 6 sRe32dfst#asd
wireless-lan country US
```

Troubleshooting Wireless Configuration on Cisco ISR 1000 Series Routers

Access Point Cannot Connect to Cisco Mobility Express or EWC

Problem

An access point is not able to connect to the Cisco Mobility Express or EWC.

Possible Causes

This problem is most likely to occur when there is no DHCP server in the management VLAN (the native VLAN of interface Wlan-GigabitEthernet).

Solution

Add the management interface of the WLAN module to a specific VLAN in order to access servers like DHCP and RADIUS. See [Prerequisites for Wireless Management on Cisco ISR 1000 Series Routers, on page 3](#)

A DHCP server is required in the native VLAN of the WiFi module to assign IP address for the access point. Without IP address, the access point will not be able to connect to Cisco Mobility Express or EWC.