

Cisco Embedded Wireless Controller on Catalyst Access Points (EWC)

Contents

Product overview	3
Getting started	5
Deploying the EWC	6
Monitoring the EWC network	16
Managing wireless settings	20
Managing the EWC network	37
Using advanced settings	46
EWC HA active and standby	47
Active EWC election process	48
Conversion	51
Migrating an EWC network to a controller-based network	55
Reference documents	57

Product overview

The Cisco Embedded Wireless Controller (EWC) on Catalyst Access Points is a software-based controller integrated into Cisco Catalyst 9100 Access Points. It is a simplified, low-cost, feature-rich Wi-Fi architecture with enterprise-level WLAN capability streamlined for small and midsize deployments. With this solution, small and midsize networks can enjoy the same quality user experiences as large enterprises.

In a Cisco EWC network, an Access Point (AP) running the wireless controller function is designated as the active AP. The other access points, which are managed by this active AP, are referred to as subordinate APs.

The active EWC has two roles:

- It functions and operates as a Wireless LAN Controller (WLC) to manage and control the subordinate APs. The subordinate APs operate as lightweight access points to serve clients.
- It operates as an access point to serve clients.

Supported Cisco access points



Figure 1.
Access points for different deployments

The access points that support the EWC function are listed in the following table.

Table 1. Access points that support the EWC

Access points supported as primary	Supported model numbers	Scale
Cisco Catalyst 9115AXI Access Point	C9115AXI-EWC-X	50 access points, 1000 clients
Cisco Catalyst 9115AXE Access Point	C9115AXE-EWC-X	50 access points, 1000 clients
Cisco Catalyst 9117AXI Access Point	C9117AXI-EWC-X	50 access points, 1000 clients
Cisco Catalyst 9120AXI Access Point	C9120AXI-EWC-X	100 access points, 2000 clients
Cisco Catalyst 9120AXE Access Point	C9120AXE-EWC-X	100 access points, 2000 clients
Cisco Catalyst 9120AXP Access Point	C9120AXP-EWC-X	100 access points, 2000 clients
Cisco Catalyst 9130AXI Access Point	C9130AXI-EWC-X	100 access points, 2000 clients
Cisco Catalyst 9130AXE Access Point	C9130AXE-EWC-X	100 access points, 2000 clients

The access points that operate as subordinate APs are listed in the following table.

Table 2. Access points supported as subordinates

Access points supported as subordinate APs	Supported model numbers
Cisco Catalyst 9100 Series	C9115AXI C9116AXE C9117AXI C9120AXI C9120AXE C9120AXP C9130AXI C9130AXE
Cisco Aironet 1800 Series	AIR-AP1832I AIR-AP1852I AIR-AP1852E AIR-AP1815I AIR-AP1815W AIR-AP1842I AIR-AP1810W
Cisco Aironet 2800 Series	AIR-CAP2802I AIR-CAP2802E
Cisco Aironet 3800 Series	AIR-CAP3802I AIR-CAP3802E
Cisco Aironet 4800 Series	AIR-CAP4802I
Cisco Aironet 1540 Series	AIR-CAP1540
Cisco Aironet 1560 Series	AIR-CAP1560
Cisco Catalyst IW6300 Heavy Duty Series	IW-6300H

Software release numbers

Cisco EWC on Catalyst Access Points is supported beginning with Release 16.12.2s.

Interoperability

Cisco EWC can interoperate with the following:

- Cisco DNA Center 1.3.3 and later release
- Cisco Connected Mobile Experiences (CMX) 10.6, Cisco Spaces
- Cisco Identity Services Engine (ISE) 2.3, 2.4, 2.5 and later release

Getting started

Ports

A port is a physical entity used to connect Cisco Catalyst 9100 Access Points to the network. Two RJ-45 ports are available on the 9100 access points:

- 1x 100, 1000, 2500, or 5000 Multigigabit Ethernet (RJ-45) – IEEE 802.3bz
- Management console port (RJ-45)

Interfaces

An interface is a logical entity on an EWC. The management interface must be configured and is used for in-band management: web UI, Telnet/SSH Command-Line Interface (CLI), or telemetry and programmable interface with NETCONF/YANG.

WLANs

A WLAN associates a Service Set Identifier (SSID) to VLANs. It is configured with the security type, Quality of Service (QoS), radio policies, and other wireless network parameters. On an EWC network, up to 16 WLANs can be configured. The WLANs can be mapped to VLANs trunked on the switch port.

Switch configuration

All access points, including the active AP in a EWC network, should be in the same Layer 2 broadcast domain.

The switch to which the access points connect has a configuration similar to the following:

```
vlan 10
name Employee
vlan 20
name Guest
vlan 122
name Management
interface Vlan10
description >> Employee Network <<
ip address 10.10.10.1 255.255.255.0
!
interface Vlan20
description >> Guest Network <<
ip address 20.20.20.1 255.255.255.0
!
interface Vlan122
description >> Management and EWC Network <<
ip address 172.20.229.2 255.255.255.0
interface GigabitEthernet1/0/37
description >> Connected to EWC AP<<
switchport trunk native vlan 122
switchport trunk allowed vlan 10,20,122
switchport mode trunk
```

Deploying the EWC

Prerequisites for deploying the EWC

The prerequisites for deploying an EWC network are as follows:

- You must not have other Cisco wireless controllers, neither appliance nor virtual, in the same network, during the setup or daily operation of a Cisco EWC network.
- An EWC network is supported in the same Layer 2 domain.
- Configure a Dynamic Host Configuration Protocol (DHCP) server on the switch or externally so that Cisco Catalyst 9100 Access Points can obtain an IP address at bootup. The DHCP server also assigns IP addresses to other APs and wireless clients.
- The DHCP server should provide default gateway and DNS server IP addresses.
- If the network is made up of different AP models, you need to set a Trivial FTP (TFTP) server that can be accessed from the management interface of the EWC. Save the C9800-AP-universalk9<version>.zip file (unzipped) on the TFTP server.
- Decide on the first AP to set up. This AP must support Cisco EWC functionality. You can also connect multiple Cisco Catalyst 9100 Access Points running the EWC to the switch.
- You will need a Wi-Fi-enabled laptop to connect to the predefined CiscoAirProvision-<last 4 digits of AP-MAC> SSID for provisioning and configuring the EWC. Alternatively, you can use a mobile device or tablet with the Cisco Catalyst Wireless application installed to configure and provision the EWC.
- If you intend to use 802.1X authentication, you need to have a RADIUS/Authentication, Authorization, and Accounting (AAA) server.
- All APs joining to EWC network should have minimum of 8.10.X or 16.12.X code.

Connecting an EWC-capable access point

To connect an EWC-capable access point to a 9100 access point, perform the following steps:

Step 1. Connect and power up the EWC-capable access point.

The switch port to which the 9100 access point is connected can be a trunk port or an access port. If multiple VLANs are being used for client traffic, the switch port should be configured to trunk the VLANs. Also note that management traffic is untagged, and if a VLAN is being used for management, it should be configured as a native VLAN on the switch port.

The following is an example of the switch port:

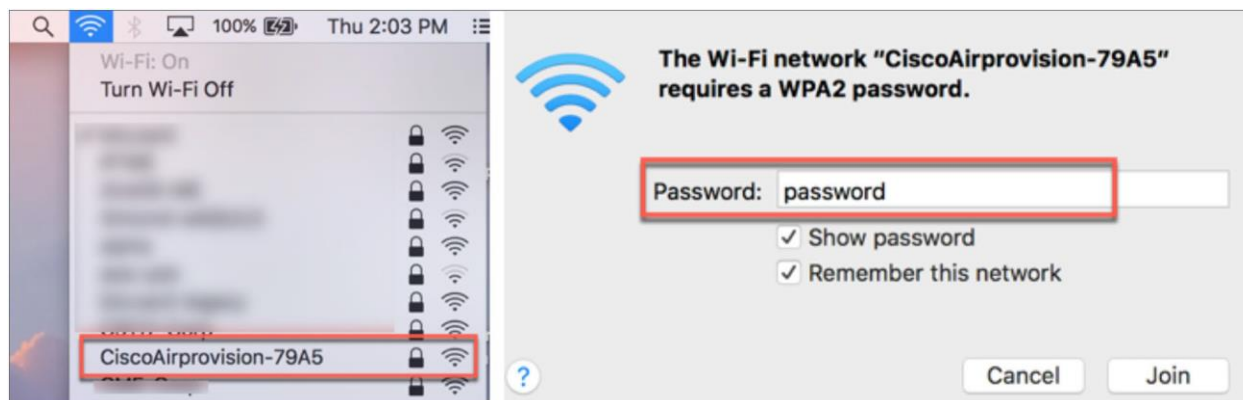
```
interface GigabitEthernet1/0/37
description » Connected to EWC AP «
switchport trunk native vlan 122
switchport trunk allowed vlan 10,20,122
switchport mode trunk
```

Step 2. Wait for approximately 5 minutes and observe the access point LED until it turns solid green and the access point starts to broadcast the **CiscoAirprovision-<XXXX> SSID**.

Day 0 - provisioning using the over-the-air setup wizard

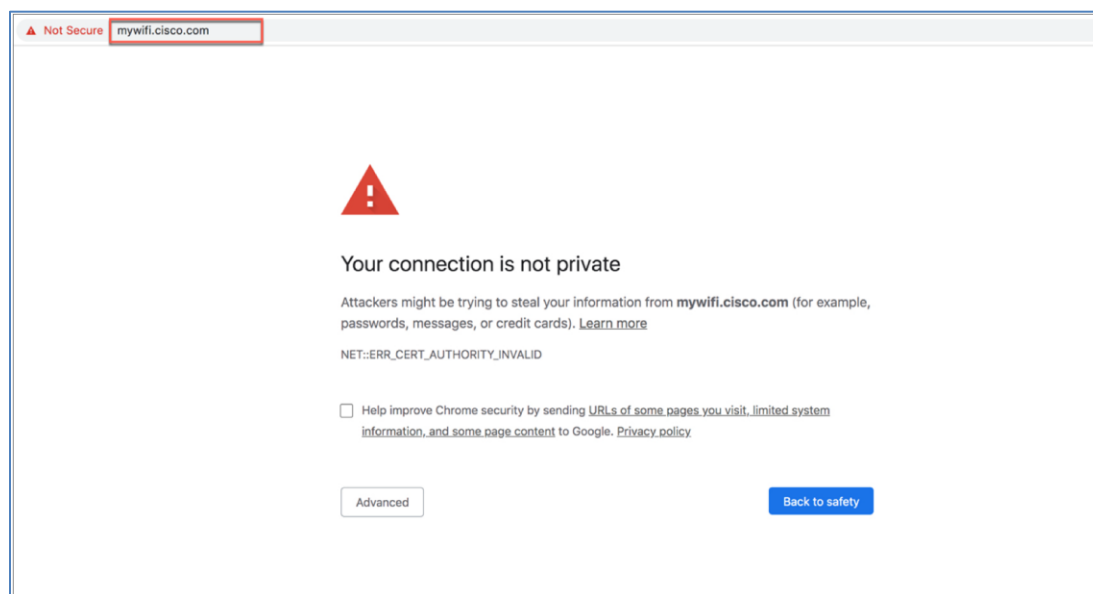
To configure the EWC using the over-the-air setup wizard, perform the following steps:

Step 1. Connect a wireless client or laptop to **CiscoAirprovision-<XXXX>** SSID with **PSK = password**.



Note: If an external DHCP server is configured, the client should get an IP address from the DHCP server.

Step 2. Open the supported browser (Chrome, Firefox, Safari, or Edge), then browse to <https://mywifi.cisco.com> on the EWC web UI.

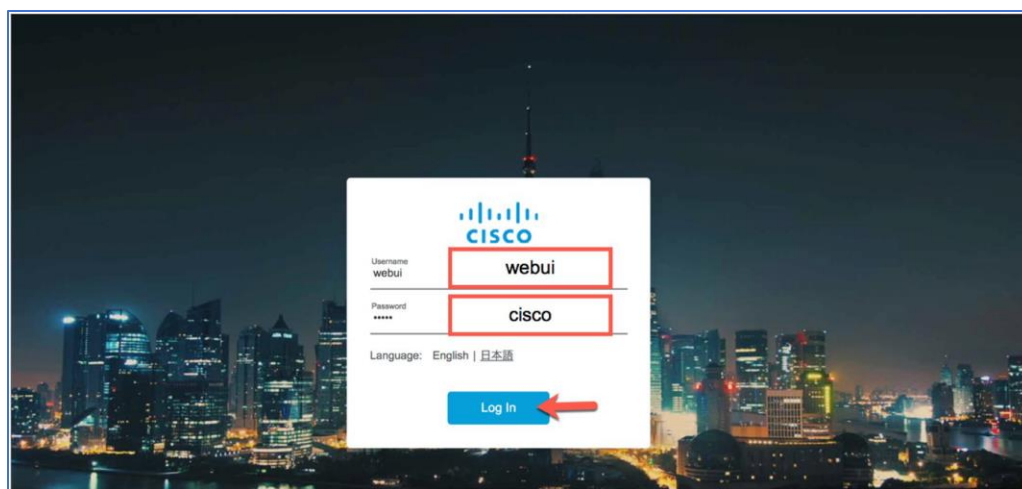


Note: The EWC uses a self-signed certificate for HTTPS. Therefore, when the certificate is presented to the browser, it will display a warning message and ask whether you wish to proceed with an exception. Accept the risk and proceed to access the EWC login page. Following is the list of supported browsers and operating systems.

Table 3. Supported browsers and operating systems

Browser	Version	Operating System	Status	Workaround
Google Chrome	77.0.3865.120	macOS Mojave Version 10.14.6	Works	Proceed through the browser warning.
Safari	13.0.2 (14608.2.40.1.3)	macOS Mojave Version 10.14.6	Works	Proceed through the browser warning.
Mozilla Firefox	69.0.1	macOS Mojave Version 10.14.6	Works only if exception is added.	Set the exception.
Mozilla Firefox	69.0.3	macOS Mojave Version 10.14.6	Works only if exception is added.	Set the exception.
Google Chrome	77.0.3865.90	Windows 10 Version 1903 (OS Build 18362.267)	Works	Proceed through the browser warning.
Microsoft Edge	44.18362.267.0	Windows 10 Version 1903 (OS Build 18362.267)	Works	Proceed through the browser warning.
Mozilla Firefox	68.02	Windows 10 Version 1903 (OS Build 18362.267)	Works	Proceed through the browser warning.
Mozilla Firefox	69.0.3	Windows 10 Version 1903 (OS Build 18362.267)	Works only if exception is added.	Set the exception.
Google Chrome	78.0.3904.108	macOS Catalina 10.15.1	Does not work	NA

Step 3. Enter **Username = webui** and **Password = cisco** to log in to the EWC wizard.



Step 4. Configure the **username** and **password**. The country will be selected according to the AP regulatory domain.

Note: If the country code is incorrect, you can select from the drop-down list by clicking the +.

The wireless management IP address is set to the DHCP address by default. If required, you can configure it by unchecking the DHCP box.

Configuration Setup Wizard

1. General Settings

Country*

Management User Settings

User Name*

Password*

Wireless Management Settings

DHCP ☒ IP Address : 10.10.99.56

Wireless Network

Please create at least one WLAN

+ Add - Delete

Network Name	Network Type	Security
No items to display		

Finish

You can also manually assign the wireless management IP address by configuring the IP address and subnet mask as shown below.

Wireless Management Settings

DHCP ☐

IP Address*

Subnet Mask*

Step 5. The last step is to configure the wireless network by creating at least one WLAN. Click + **Add** to do this.

Wireless Network

Please create at least one WLAN

+ Add - Delete

Network Name	Network Type	Security
No items to display		

The Add Network dialog will appear so you can configure the WLAN settings. Assign the following:

Network name: This defines the network or WLAN/SSID name.

Network type: This can be an employee or guest WLAN. If you select Employee, there is an option to select the security type.

Security: This option defines the WLAN security type, such as WPA2 Personal (PSK/password authentication) or WPA2 Enterprise (802.1X with RADIUS authentication)

Click **Add** to create the WLAN.

The 'Add Network' dialog box is shown with the following fields and values:

- Network Name*: CME-Corp
- Network Type: Employee (selected), Guest
- Security: WPA2 Personal
- Pre-Shared Key*: [Redacted]

At the bottom, there are 'Cancel' and 'Add' buttons. Red arrows point to the Network Name, Network Type, Security, Pre-Shared Key, and the Add button.

If you select **WPA2 Enterprise** as the security type, you will need to configure an AAA server.

Configure the AAA server IP address and shared secret and click the +. The assigned AAA server will appear in the list of **available AAA servers**. Click **Add** to configure the 802.1X-enabled WLAN.

The 'Add Network' dialog box is shown with the following fields and values:

- Network Name*: CME-Corp
- Network Type: Employee (selected), Guest
- Security: WPA2 Enterprise
- AAA Servers: 10.10.105.35, [Redacted]

A yellow warning banner at the top states: "AAA servers are mandatory for 'Enterprise' security." Below the AAA Servers fields, it says "No AAA Servers available". A red arrow points to the plus icon next to the AAA Servers fields. At the bottom, there are 'Cancel' and 'Add' buttons. Red arrows point to the Network Name, Network Type, Security, AAA Servers, and the Add button.

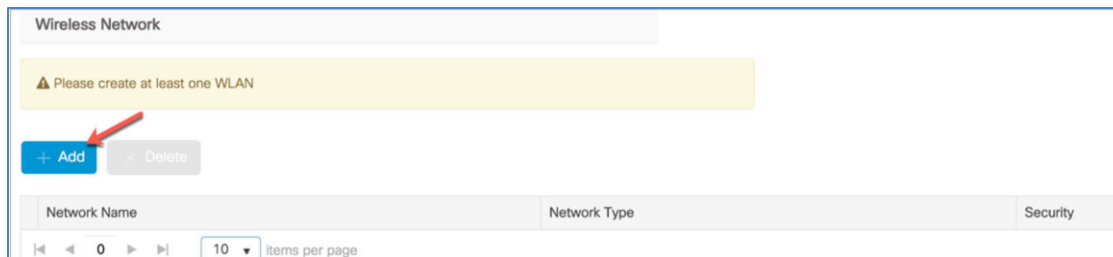
The 'Add Network' dialog box is shown with the following fields and values:

- Network Name*: CME-Corp
- Network Type: Employee (selected), Guest
- Security: WPA2 Enterprise
- AAA Servers: Enter Server IP, Enter Key
- Available AAA Servers: 10.10.105.35

At the bottom, there are 'Cancel' and 'Add' buttons. Red arrows point to the 'Available AAA Servers' list and the Add button.

Adding a guest WLAN

Similarly, you can add a guest WLAN by clicking **Add**.



Wireless Network

Please create at least one WLAN

+ Add **- Delete**

Network Name	Network Type	Security
--------------	--------------	----------

0 10 items per page

Assign the following:

Network name: This defines the network or WLAN/SSID name.

Network type: Choose the Guest option.

Security: The Consent option is chosen by default on day 0.

Click **Add** to create the WLAN.



Add Network

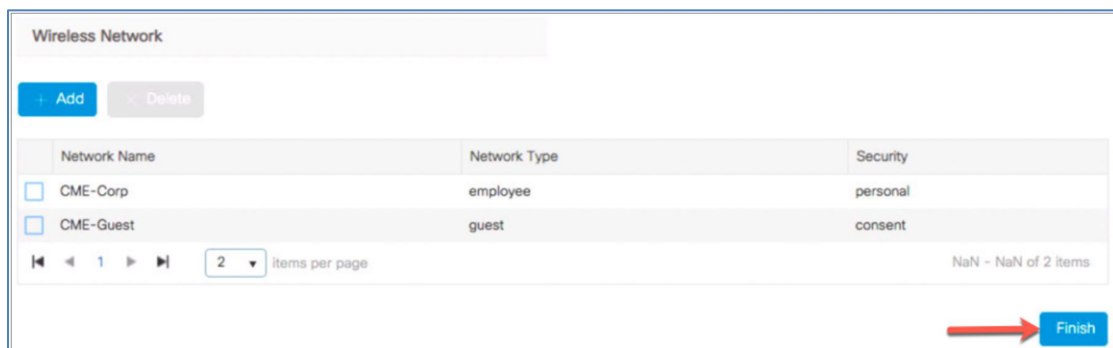
Network Name* CME-Guest 1

Network Type ☐ Employee ☒ Guest 2

Security Consent

Cancel Add 3

Step 6. Verify the settings and then click **Finish** to push this configuration to the EWC. The dialog will pop up to inform you that CiscoAirprovision-<XXXX> SSID will be disabled and you need to connect to the configured employee SSIDs to manage the device. Click **Yes** if the configuration is correct and then, in the other information dialog, click **OK**.



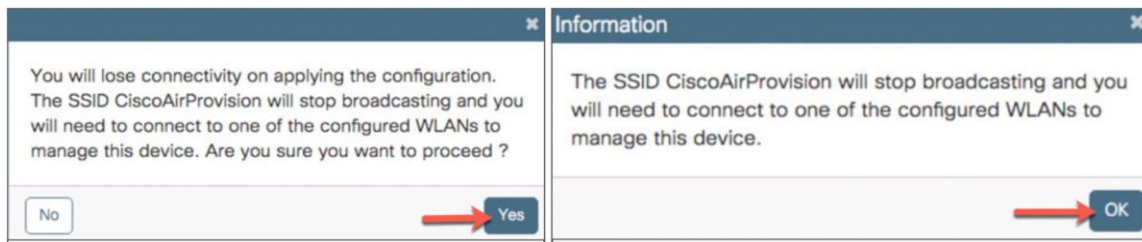
Wireless Network

+ Add **- Delete**

Network Name	Network Type	Security
☐ CME-Corp	employee	personal
☐ CME-Guest	guest	consent

1 2 items per page NaN - NaN of 2 items

Finish



The access points will **NOT** reboot.

If required, you can also do SSH/CLI-based day-0 provisioning.

For SSH-based day-0 provisioning from a wireless client, follow these steps:

1. Connect a wireless client to the CiscoAirProvision-<XXXX> SSID.
2. You can SSH to the controller using **ssh -l webui mywifi.cisco.com**, with the password = **cisco**.
3. This will display the day-0 banner, which will point you to the day-0 device provisioning guide and the command to access it. Basically, the day-0 device provisioning guide will describe the sequence of steps to follow to complete the day-0 device provisioning, as shown below.

```
XYZ-MCA:~ tme$ ssh -l webui mywifi.cisco.com
The authenticity of host 'mywifi.cisco.com (10.10.10.196)' can't be established.
RSA key fingerprint is SHA256:0LASolvHdT/+FrmY6DvY+C7Bz/QSAYTr+N48QihYaEg.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'mywifi.cisco.com,10.10.10.196' (RSA) to the list of known hosts.
Password: cisco

#####
#
# Welcome to the Cisco Catalyst 9800-AP Embedded Wireless Controller command line interface
#
# !!! Please complete the DAY0 Device Provisioning !!!
# !!! NOTE: COMPLETE ALL THE STEPS IN PROVISIONING GUIDE !!!
#
# To access the provisioning guide type the below command:
# more bootflash:ewc_day0_device_provisioning_guide
#
#####

WLC04F7.D54D.5F9C>more bootflash:ewc_day0_device_provisioning_guide
#####
# Welcome to the Cisco Catalyst 9800-AP Embedded Wireless Controller
# command line interface guide for DAY0 device provisioning
# Copyright (c) 2019 by Cisco Systems, Inc.
#
# Please read carefully and execute all the steps highlighted below to
# complete the DAY0 device provisioning.
#
# 1. The SSH session will timeout if there is 5 minutes of inactivity.
# In that case, please SSH back and continue the provisioning from where
# it was left earlier.
#
# 2. Please DO NOT save the configuration unless all the steps are
# completed successfully.
#####

Note: After completing all the steps highlighted below, the device
will be provisioned. In case if the interface GigabitEthernet0 IP address
or the Country Code needs to be changed, please do so using the WEBUI
after connecting the client to SSID Network created in Step 3A

Step 1 - Configure the Host Name (Optional)
=====
WLC7069.5A74.7C78#conf t
WLC7069.5A74.7C78 (config)#hostname <#host-name>
<#host-name>(config)#end

For example:
WLC7069.5A74.7C78#conf t
WLC7069.5A74.7C78(config)#hostname C9800-AP
C9800-AP(config)#end

Step 2A - Set the administrative username/password
=====
C9800-AP#conf t
C9800-AP(config)# username <#username> privilege 15 password <#password>
C9800-AP(config)#end
```

Step 2B - Configure the AP Profile

=====

To configure the AP management username/password for AP profile,
Please use the SAME username/password configured in step 2A.

```
C9800-AP#conf t
C9800-AP(config)#ap profile default-ap-profile
C9800-AP(config-ap-profile)#mgmtuser username <#username> password 0 <#password> secret 0 <#password>
C9800-AP(config-ap-profile)#end
```

For example, to configure the AP management username and password

```
C9800-AP#conf t
C9800-AP(config)#ap profile default-ap-profile
C9800-AP(config-ap-profile)#mgmtuser username admin password 0 Network123 secret 0 Network123
C9800-AP(config-ap-profile)#end
```

Step 3A - Configure the Wireless Local Area Network

```
=====
C9800-AP#conf t
C9800-AP(config)#wlan <#wlan-profile-name> <#wlan-id> <#ssid-network-name>
C9800-AP(config-wlan)# no security wpa akm dot1x
C9800-AP(config-wlan)# security wpa pak set-key ascii 0 <#pre-shared-key>
C9800-AP(config-wlan)# security wpa akm psk
C9800-AP(config-wlan)# no shutdown
C9800-AP(config-wlan)#end
```

For example to configure a PSK WLAN named "employee" with pre-shared key "Cisco123"

```
C9800-AP#conf t
C9800-AP(config)# wlan employee 1 employee
C9800-AP(config-wlan)# no security wpa akm dot1x
C9800-AP(config-wlan)# security wpa pak set-key ascii 0 Cisco123
C9800-AP(config-wlan)# security wpa akm psk
C9800-AP(config-wlan)# no shutdown
C9800-AP(config-wlan)#end
```

Step 3B - Configure the Wireless Profile Policy

=====

The wireless profile policy name must be SAME as the <#wlan-profile-name>
configured in step 3A.

```
C9800-AP#conf t
C9800-AP(config)#wireless profile policy <#wlan-profile-name>
C9800-AP(config-wireless-policy)#no central association
C9800-AP(config-wireless-policy)#no central dhcp
C9800-AP(config-wireless-policy)#no central switching
C9800-AP(config-wireless-policy)#http-tlv-caching
C9800-AP(config-wireless-policy)#session-timeout 86400
C9800-AP(config-wireless-policy)#no shutdown
C9800-AP(config-wireless-policy)#end
```

For example to configure the profile policy for WLAN profile name "employee"

```
C9800-AP#conf t
C9800-AP(config)#wireless profile policy employee
C9800-AP(config-wireless-policy)#no central association
C9800-AP(config-wireless-policy)#no central dhcp
C9800-AP(config-wireless-policy)#no central switching
C9800-AP(config-wireless-policy)#http-tlv-caching
C9800-AP(config-wireless-policy)#session-timeout 86400
C9800-AP(config-wireless-policy)#no shutdown
C9800-AP(config-wireless-policy)#end
```

Step 3C - Configure the Default Policy Tag

=====

To map the WLAN to the Profile Policy, use the SAME <#wlan-profile-name>
configured in step 3A.

```
C9800-AP#conf t
C9800-AP(config)#wireless tag policy default-policy-tag
C9800-AP(config-policy-tag)#wlan <#wlan-profile-name> policy <#wlan-profile-name>
C9800-AP(config-policy-tag)#end
```

For example to map the WLAN profile name "employee" to the policy profile
name "employee" in the default policy tag

```
C9800-AP#conf t
C9800-AP(config)#wireless tag policy default-policy-tag
C9800-AP(config-policy-tag)#wlan employee policy employee
C9800-AP(config-policy-tag)#end
```

```

Step 4 - Turn on the global encryption
=====
This config is highly recommended for the security.

Without this config, all the credentials are saved as plain text.
With this configuration, all the credentials are saved as encrypted strings.

User needs to input a "key" for password here, It's recommended to use the SAME
administrative password configured in step 2A as the key for password encryption.

C9800-AP#conf t
C9800-AP(config)#service password-encryption
C9800-AP(config)#password encryption aes
C9800-AP(config)#key config-key newpass <#password>
C9800-AP(config)#end

For example, the global encryption can be configured as below
C9800-AP#conf t
C9800-AP(config)#service password-encryption
C9800-AP(config)#password encryption aes
C9800-AP(config)#key config-key newpass Network123
C9800-AP(config)#end

Step 5 - Save the Configuration
=====

STOP: IMPORTANT NOTE 1: YOU WILL LOSE CONNECTIVITY NOW
=====
When the configuration is saved, the connectivity to the SSH session
will be lost.

STOP: IMPORTANT NOTE 2: THIS IS HOW YOU CONNECT BACK
=====

WEBUI:
To make any further configurations to the device, please use the WEBUI.
In order to access the WEBUI, please connect the wireless client to the
Network configured in step 3A and type the URL "https://mywifi.cisco.com"
in the browser. Please use the credentials (username/password) configured
in step 2A to login to the WEBUI.

SSH:
To SSH to the device going forward, connect to the
Network created in step 3A and please use the admin username/password
configured in step 2A

NOW execute the below command to complete the device provisioning:

C9800-AP# write memory

#####

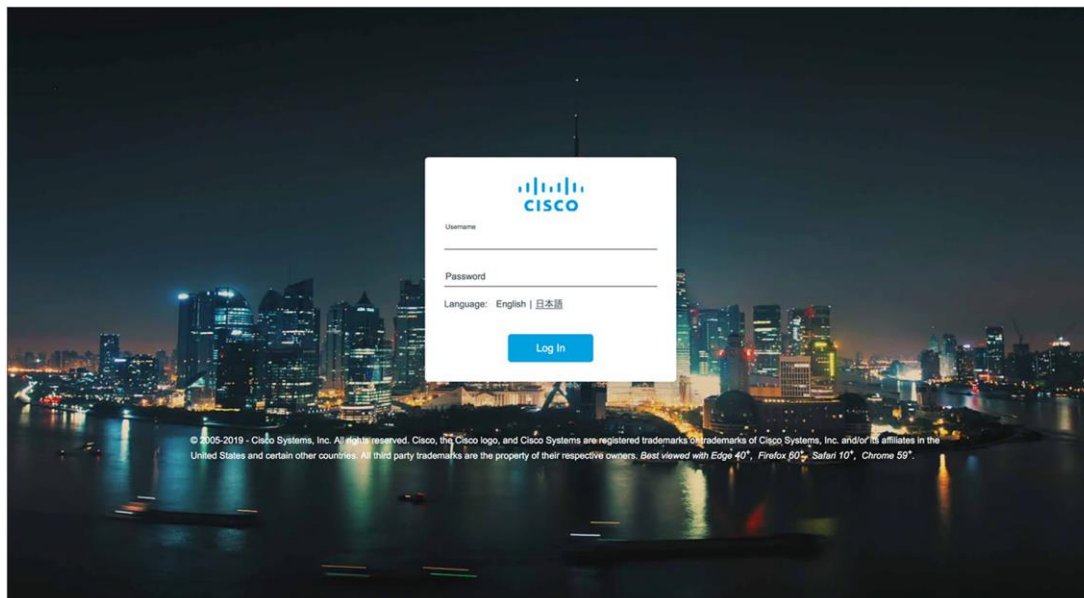
```

Logging in to the EWC

To log in to the EWC, perform the following steps:

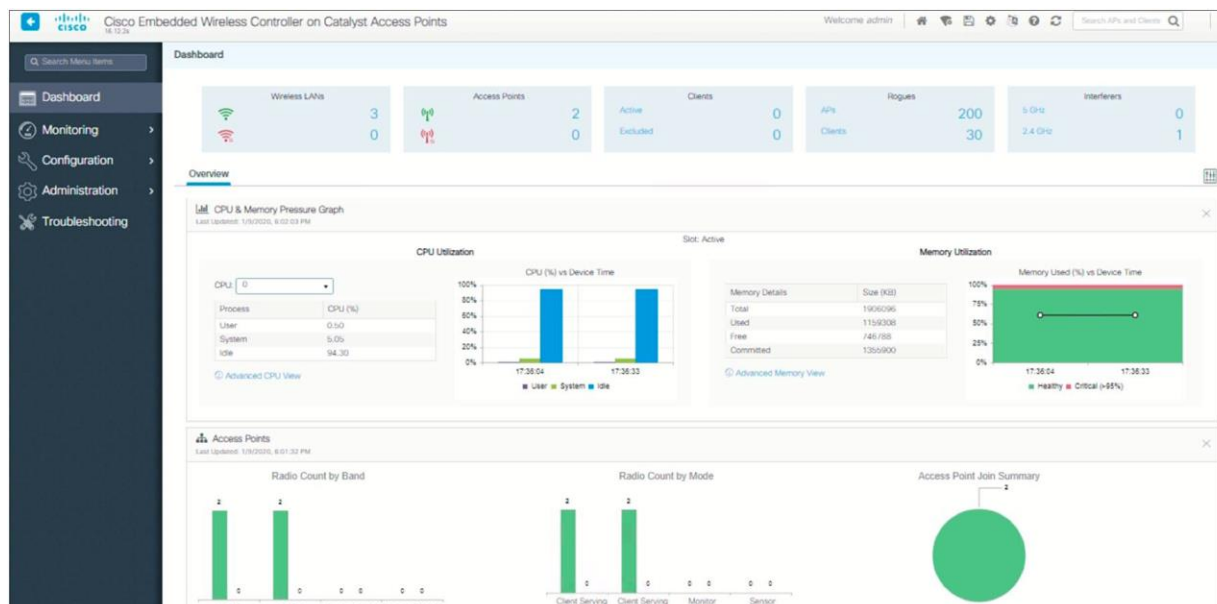
Procedure

- Step 1.** Connect to the employee SSID that you created from the configuration wizard. Enter the URL <https://mywifi.cisco.com> in the web browser. The Cisco Catalyst EWC login page should appear.



Step 2. Enter the administrator username and password.

The network summary page appears on the main dashboard.



Note: For an advanced configuration or expert view, go to **Preferences** on the top right side of the page, set the **Current Configuration Mode** to **Expert**, and click **Save**.



Changing 'Configuration Mode' will trigger auto refresh of this GUI

Default Landing Page: **Dashboard**

Grid Size: **10**

Track Logged In User: **OFF**

Current Configuration Mode: ☐ Simple ☒ **Expert**

Save **Cancel**

Monitoring the EWC network

Viewing the network summary

The monitoring service allows the admin to monitor the Cisco EWC network.

The monitoring dashboard

The monitoring dashboard of the network summary page displays counts of the following:

Wireless networks

Access points

Active clients in 2.4 GHz and 5 GHz

Rogue APs and clients

Interferers

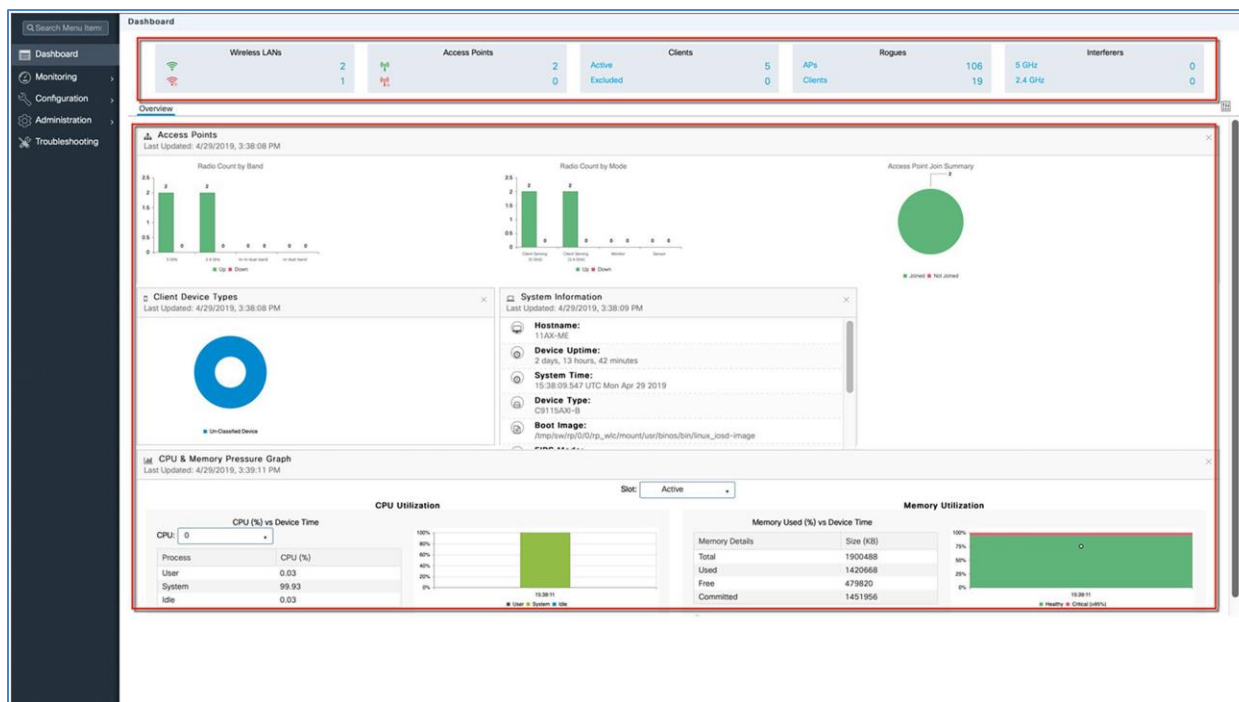
The network summary page has five customizable widgets representing data in both tabular and graphical formats for the following:

Access points (by band and mode)

Client device types

System information

CPU and memory pressure graph



View an access points summary using the GUI

To view the access points using the GUI, perform the following steps:

Step 1. Click the access points on the dashboard or go to **Monitoring > Wireless > AP Statistics**. A table displays the list of access points and gives the following information:

AP name

AP MAC address

Admin status

Operational status

Site tag

Policy tag

RF tag

CMX IP address

AP profile

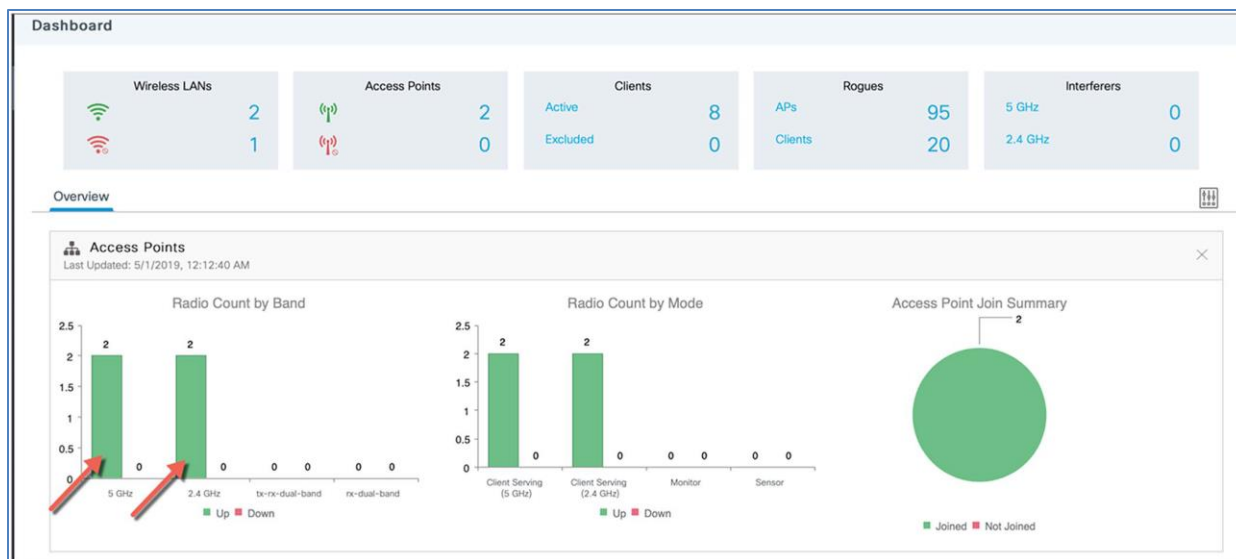


The screenshot shows the 'AP Statistics' page with a table of access points. The table has columns for AP Name, AP MAC, Admin Status, Operation Status, Site Tag, Policy Tag, RF Tag, Hyperlocation Method, CMX IP, and AP Profile. Two access points are listed, both with 'Registered' operation status.

AP Name	AP MAC	Admin Status	Operation Status	Site Tag	Policy Tag	RF Tag	Hyperlocation Method	CMX IP	AP Profile
AP7069.5A74.7A2C	7069.5a78.7660	Enabled	Registered	default-site-tag	default-policy-tag	default-rf-tag	Unknown		default-ap-profile
AP7069.5A74.8F30	f80f.6f15.4680	Enabled	Registered	default-site-tag	default-policy-tag	default-rf-tag	Unknown		default-ap-profile

Step 2. Click the access points' **Radio Count by Band** or go to **Monitoring > Wireless > Radio Stats**. A table displays the list of radios.

Step 3. Toggle between the 2.4 GHz, 5 GHz, and Dual-Band radio tabs to view a list of the access points operating at the respective radio frequencies.



Monitoring > Wireless > Radio Statistics

5 GHz Radios 2.4 GHz Radios Dual-Band Radios

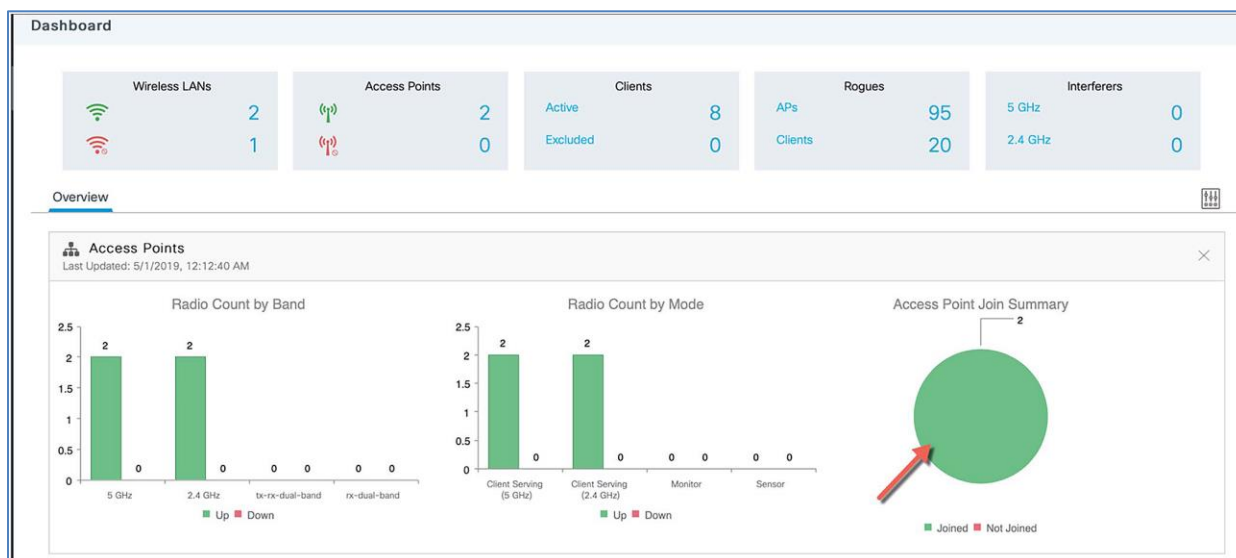
Number of all 5 GHz radios: 2

Operation Status *Is equal to* Up Radio Type *Is equal to* 5 GHz

AP Name	AP Model	Slot No	Base Radio MAC	IP Address	Admin Status	Operation Status	Uptime	Radio Role	Channel	Power Level	Spectrum AP Type	Spectrum Admin Status	Sf	Op	St
AP7069.5A74.7A2C	C9115AXI-B	1	7069.5A78.7660	10.10.10.158	Enabled	Up	3 days 22 hrs 25 mins 50 secs	Automatic (Remote)	(124)*	1*	Invalid	Disabled	Do		
AP7069.5A74.8F30	C9115AXI-B	1	F80F.6F15.4680	10.10.10.245	Enabled	Up	3 days 22 hrs 11 mins 29 secs	Automatic (Remote)	(64)*	1*	Invalid	Disabled	Do		

1 - 2 of 2 items

Step 4. Click **Access Point Join Summary** or go to **Monitoring > Wireless > AP Statistics > Join Statistics** to view the AP join statistics.



Search Menu Items

Dashboard

Monitoring

Configuration

Administration

Troubleshooting

Monitoring > Wireless > AP Statistics

General Join Statistics

Clear Clear All

Number of AP(s): 2

Status * Is equal to* JOINED

Status	Base Radio MAC	Ethernet MAC	AP Name	IP Address
	7069.5a78.7660	7069.5a74.7a2c	AP7069.5A74.7A2C	10.10.10.158
	fb0f.6f15.4680	7069.5a74.8f30	AP7069.5A74.8F30	10.10.10.245

1 - 2 of 2 Join Statistics

View client summary

To view a client summary using the GUI, perform the following steps:

Procedure

- Click Clients on the monitoring dashboard, or go to **Monitoring > Wireless > Clients**.
- (Optional) Click the down arrow on each column to filter the table view based on the desired parameters.

Dashboard

Wireless LANs

2

1

Access Points

2

0

Clients

Active 8

Excluded 0

Rogues

APs 98

Clients 20

Interferers

5 GHz 0

2.4 GHz 0

Monitoring > Wireless > Clients

Clients Sleeping Clients Excluded Clients

Delete

Total Client(s) in the Network: 8

Number of Client(s) selected: 0

Client MAC Address	IPv4 Address	IPv6 Address	AP Name	SSID	WLAN ID	State	Protocol	User Name	Device Type	Role
☐ 044e.afb0.f49d	10.10.10.86	N/A	AP7069.5A74.8F30	IOT	2	Run	11ac		Un-Classified Device	Local
☐ 18b4.3013.e0c2	10.10.10.54	fe80::1ab4:30ff:fe13:e0c2	AP7069.5A74.7A2C	IOT	2	Run	11n(2.4)		Un-Classified Device	Local
☐ 18b4.305f.8576	10.10.10.123	N/A	AP7069.5A74.8F30	IOT	2	Run	11n(5)		Un-Classified Device	Local
☐ 18b4.3067.4db7	10.10.10.80	N/A	AP7069.5A74.8F30	IOT	2	Run	11n(5)		Un-Classified Device	Local
☐ 18b4.30c2.ef55	10.10.10.210	fe80::1ab4:30ff:fec2:ef55	AP7069.5A74.8F30	IOT	2	Run	11n(5)		Un-Classified Device	Local
☐ 3ce1.a155.a860	N/A	N/A	AP7069.5A74.7A2C	IOT	2	IP Learn	11n(2.4)		Un-Classified Device	Local
☐ 6416.667b.cdf1	10.10.10.173	N/A	AP7069.5A74.8F30	IOT	2	Run	11n(5)		Un-Classified Device	Local
☐ 90f1.aaaa.1870	10.10.10.21	N/A	AP7069.5A74.8F30	EMPLOYEE	1	Run	11n(5)		Un-Classified Device	Local

1 - 8 of 8 clients

Managing wireless settings

The Cisco Catalyst EWC configuration data model is based on design principles of reusability, simplified provisioning, enhanced flexibility, and modularization to help manage networks as they scale and to simplify the management of dynamically changing business and IT requirements.

This model provides a way for the client/AP devices to derive their configurations from profiles that are contained within tags. APs can be mapped to the tags either statically or as part of the rule engine that runs on the controller and takes effect during the AP join process. Configuration objects are modularized as objects, which helps in the reusability of the configuration. In addition, a flat tag-based configuration model eliminates the complexities associated with inheritance and container-based grouping, leading to a simpler and more flexible configuration that can ease change management.

Elements of the configuration model - tags and profiles

Profiles

Profiles define the properties of the AP or associated clients. Profiles are reusable entities that can be used across tags. A default policy profile, AP join profile, flex profile, and 2.4-GHz and 5-GHz RF profiles are available by default on the wireless controller at boot time.

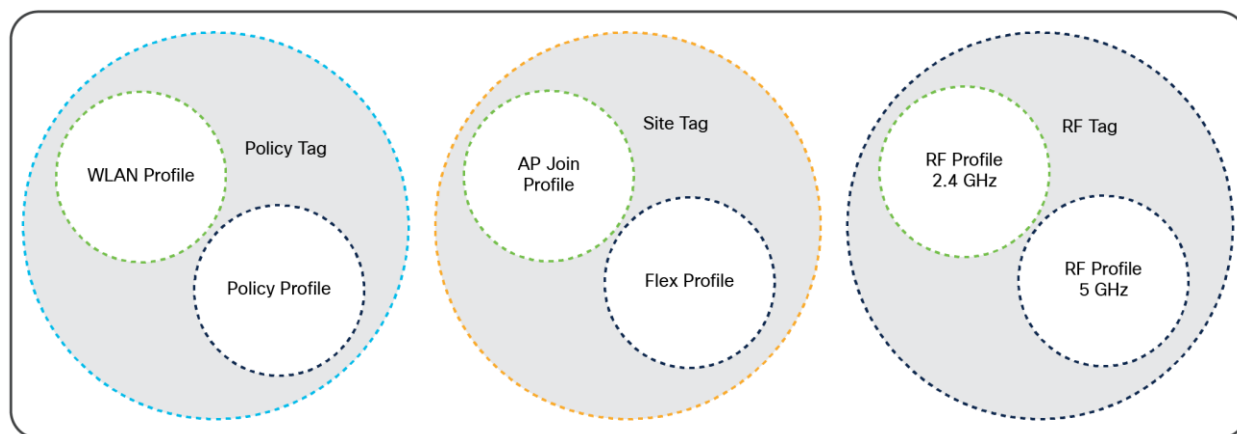


Figure 2.
Profiles and tags

There are different kinds of profiles depending on the characteristics of the network they define.

WLAN profile

The WLAN profile defines the properties of a WLAN, such as profile name, status, WLAN ID, Layer 2 and Layer 3 security parameters, AAA server associated with this SSID, and other parameters that are specific to a particular WLAN.

Policy profile

The policy profile defines the network policies and the switching policies for a client, with the exception of QoS, which constitutes the AP policies as well. The policy profile is a reusable entity across tags. Anything that is a policy for the client applied on the AP/controller is moved to the policy profile. For example, VLAN, Access Control List (ACL), QoS, session timeout, idle timeout, Application Visibility and Control (AVC) profile, Bonjour profile, local profiling, device classification, etc. The switching policies define the central switching or local switching attribute of a WLAN.

The WLAN profile and policy profile are both part of a policy tag and define the characteristics and policy definitions of a set of WLANs.

AP join profile

The following parameters will be part of the AP join profile: Control and Provisioning of Wireless Access Points (CAPWAP) IPV4/IPV6, User Datagram Protocol (UDP) Lite, high availability, retransmit configuration parameters, global AP failover, hyperlocation configuration parameters, Telnet/SSH, 802.11u parameters, etc. For AP join profile changes, a small subset requires the CAPWAP connection to be reset, since these parameters pertain to the characteristic of the AP.

Flex profile

The flex profile contains the remote site-specific parameters. For example, the AP list, the Extensible Authentication Protocol (EAP) profiles, which can be used for the case in which an AP acts as an authentication server, local RADIUS server information, VLAN-to-ACL mapping, etc.

The AP join profile and flex profile are both part of a site tag and define the characteristics of a remote site.

RF profile

There are two default RF profiles (one for 802.11a and one for 802.11b). RF profiles constitute the RF-specific configurations such as data rates, Modulation and Coding Scheme (MCS) settings, power assignment, dynamic channel assignment (DCA) parameters, coverage hold detection and mitigation (CHDM) variables, and High Density Experience (HDX) features. One 802.11a RF profile and one 802.11b RF profile can be added to an RF tag.

Tags

A tag's property is defined by the policies associated with it. This property is in turn inherited by an associated client/AP. There are various types of tags, each associated with different profiles. No two types of tags include profiles with common properties. This helps eliminate precedence issues among the configuration entities to a large extent. Every tag has a default that is created when the system boots up.



Figure 3.
The three kinds of tags

Policy tag

The policy tag contains the mapping of WLAN profiles to policy profiles.

A default policy tag with WLAN profiles and a WLAN ID < 16 is mapped to a default policy profile.

Site tag

The site tag consists of two profiles, the flex profile and the AP join profile. The site tag defines the properties of a site, for both central and remote (FlexConnect) sites. The attributes of a site that are common across central and remote sites are part of the AP join profile. The attributes that are specific to a remote site are part of the flex profile.

The default site tag consists of the default AP join profile. The default AP join profile values will be the same as those for the global AP parameters, plus a few parameters from the AP group in the current configuration, such as preferred mode, 802.11u parameters, location, etc.

Note: In EWC only one site tag is supported and it has to be the default-site-tag. Also, in EWC there is no central site concept as EWC is a FlexConnect local switching deployment.

RF tag

The RF tag contains the 2.4-GHz and 5-GHz RF profiles.

The default RF tag consists of the default 2.4-GHz RF profile and the default 5-GHz RF profile. These default profiles contain default values for the global RF profiles for the respective radios.

Association of tags to APs

Access points are tagged based on their broadcast domain, the site the AP belongs to, and the RF characteristics desired. Once tagged, an AP gets a list of WLANs to be broadcasted, along with the properties of the respective SSIDs, properties of the APs on the local or remote site, and RF properties of the network. By default, an AP is tagged with the default policy, site, and RF tag unless explicitly changed. When a tag associated with an AP is changed, the AP resets its CAPWAP connection.

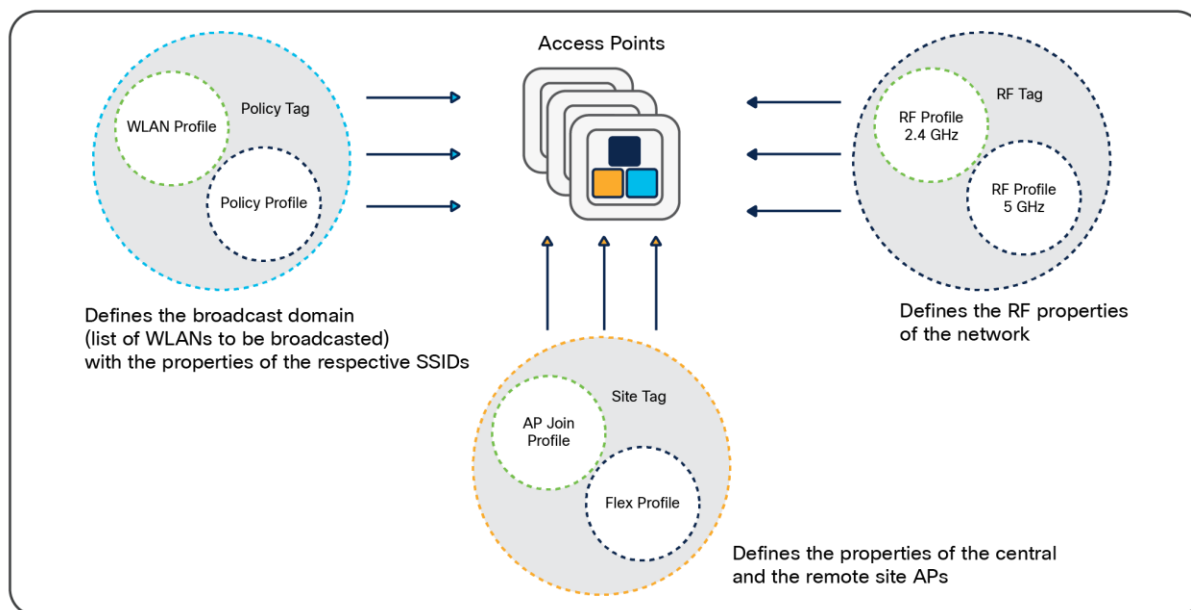


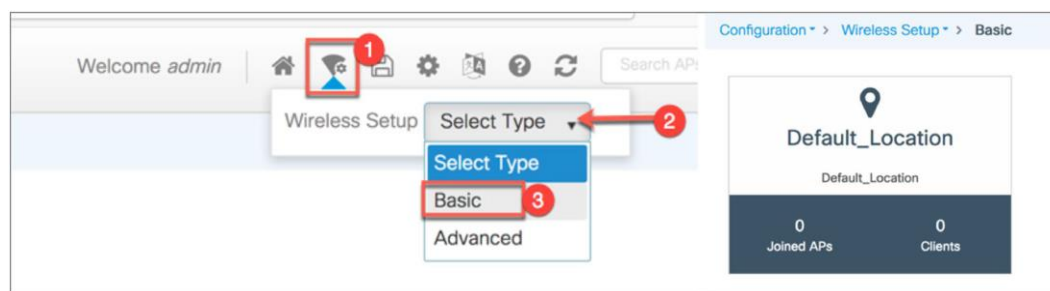
Figure 4.
How access points are tagged

Creating a WLAN through basic wireless setup

The basic wireless setup uses intent-based workflows to define a site, create wireless networks for that site, define policies such as VLAN, ACL, and QoS, and also fine-tune RF characteristics. Corresponding policies and tags are created in the back end in accordance with the new configuration model, but they are transparent to the end user. Access points are assigned to the site and in turn are assigned policy, RF, and site tags.

To access the basic wireless setup, click the Wireless Setup icon in the top right corner of the dashboard page.

Step 1: From the EWC top right corner, go to **Wireless Setup > Select Type > Basic**, then click Default_Location.



Step 2: From the General tab, you can define parameters such as client density, native VLAN, and AAA server as per their deployments.

The screenshot shows the 'General' tab of the 'Wireless Setup' configuration page. The breadcrumb trail is 'Configuration > Wireless Setup > Basic'. At the top right are 'Delete Location' and 'Apply' buttons. A warning message states: 'This Location uses Default Site, Global RF Configuration. Changes will impact all the APs which use this configuration.' Below this, there are three tabs: 'General' (selected), 'Wireless Networks', and 'AP Provisioning'. The 'General' tab contains the following fields: 'Location Name*' with a value of 'Default_Location', 'Description' with a value of 'Default_Location', 'Client Density' with a slider set to 'Low' (between 'Low' and 'High' with a 'Typical' marker), and 'Native VLAN ID' with a value of '1'. To the right, under 'AAA Servers', there are two columns: 'Available (0)' and 'Selected (0)'. Both columns show 'No AAA servers available' and 'No AAA servers selected' respectively. At the bottom right of the AAA Servers section is a link 'Add New Server'.

Step 3: WLANs created as part of a day-0 setup are available to add to this site. These WLANs can be added as is or modified for the policy details that are required for this network in the site. Alternatively, new SSIDs can be created using the “Define new” button.

To add a new WLAN go to the **Wireless Networks** tab and click **+Add**, then click **Define new** to configure the WLAN.

The screenshot shows the 'Wireless Networks' tab selected in the configuration page. The 'General' tab is also visible. In the 'Wireless Networks' tab, there is a '+ Add' button and a 'Delete' button. Below these buttons is the text 'WLANs on this Location'. A red arrow points to the '+ Add' button.

The screenshot shows the 'Add Location Setup' dialog box. It has two main sections: 'Wireless Network Details' and 'Policy Details'. In the 'Wireless Network Details' section, there is a 'WLAN*' field with a 'Search or Select' dropdown and a link 'or Define new' with a red arrow pointing to it. In the 'Policy Details' section, there are four fields: 'VLAN ID*' with a value of '1-4094', 'ACL' with a 'Search or Select' dropdown and a link 'or Define new', 'Pre Auth URL Filter' with a 'Search or Select' dropdown, and 'QoS' with a 'Search or Select' dropdown. At the bottom left is a 'Close' button and at the bottom right is an 'Add' button.

Step 4: This opens a WLAN window. On the General tab, configure the WLAN profile name, SSID, WLAN ID, and radio policy. Enable the status, and then go to the Security tab.

Add WLAN

General Security Advanced

Please add the WLANs to Policy Tags for them to broadcast.

Profile Name* Corp-Employee Radio Policy All

SSID* Corp-Employee Broadcast SSID ENABLED

WLAN ID* 2

Status ENABLED

Step 5: You can define the security settings per the required configuration.

Add WLAN

General Security Advanced

Layer2 Layer3 AAA

Layer 2 Security Mode WPA + WPA2 Fast Transition Adaptive Enabled

MAC Filtering Over the DS

Protected Management Frame Reassociation Timeout 20

PMF Disabled

WPA Parameters

Step 6: Now you need to provision the AP. Select the AP from the available AP list and click the arrow. The AP will be moved to the list of APs associated with the location. Then click Apply.

AP Provisioning

General Wireless Networks AP Provisioning

Add/Select APs

Import AP MAC Select File Select CSV File

AP MAC Address

Available AP list Search

Number of selected APs : 1

AP MAC	AP Name
d4e8.8019.5834	APD4E8.8019.5834

Changes will impact all the APs which use this configuration.

APs on this Location

Associated AP list Search

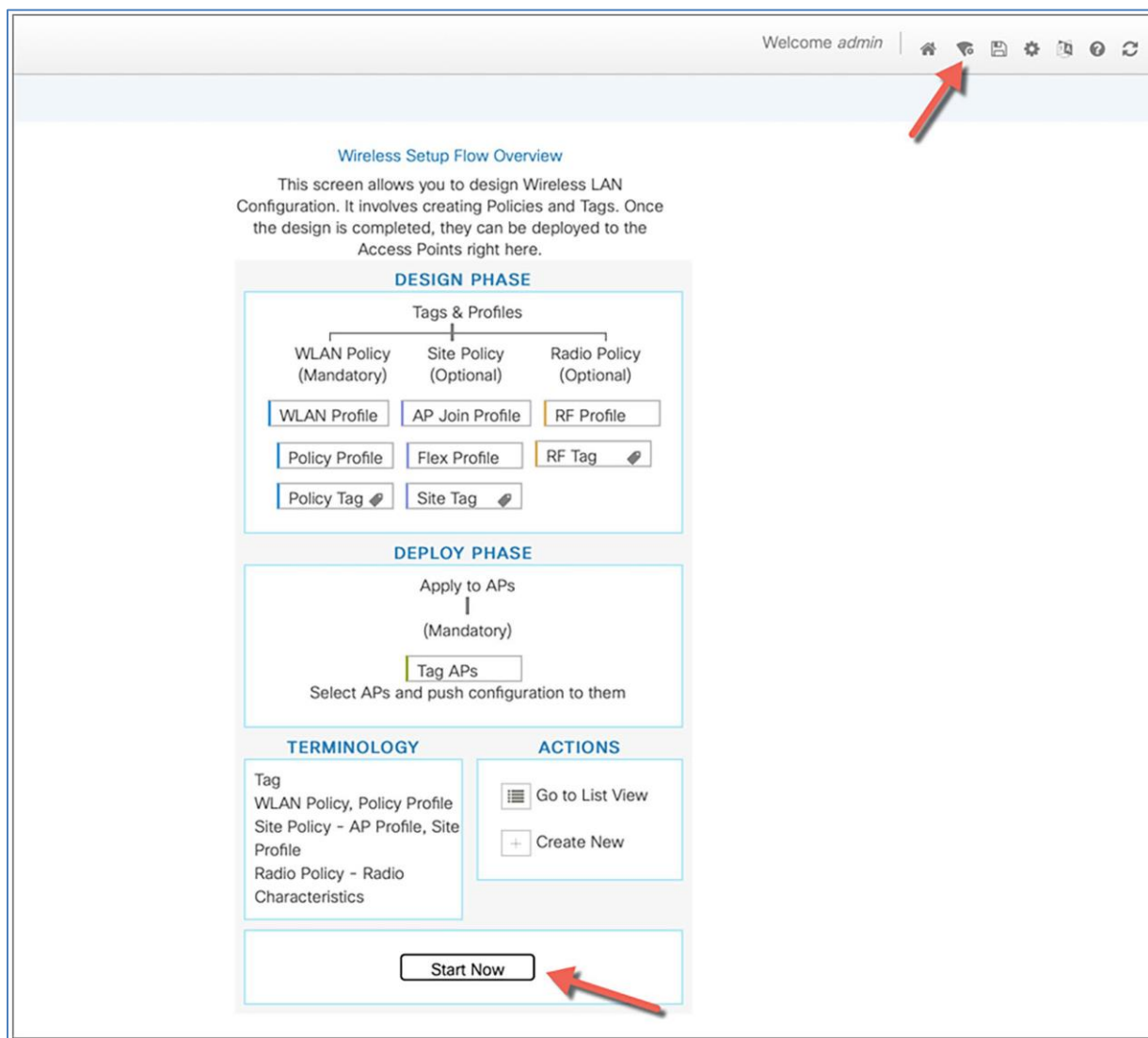
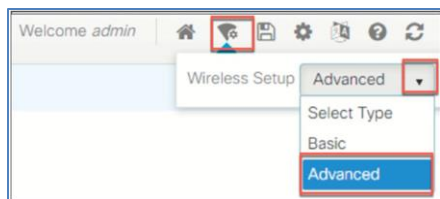
Number of selected APs : 0

AP MAC	AP Name	Status
d4e8.8019.5834	APD4E8.8019.5834	Joined

Policy, site, and RF tags are automatically pushed to the access points upon provisioning.

Creating a WLAN through advanced wireless setup

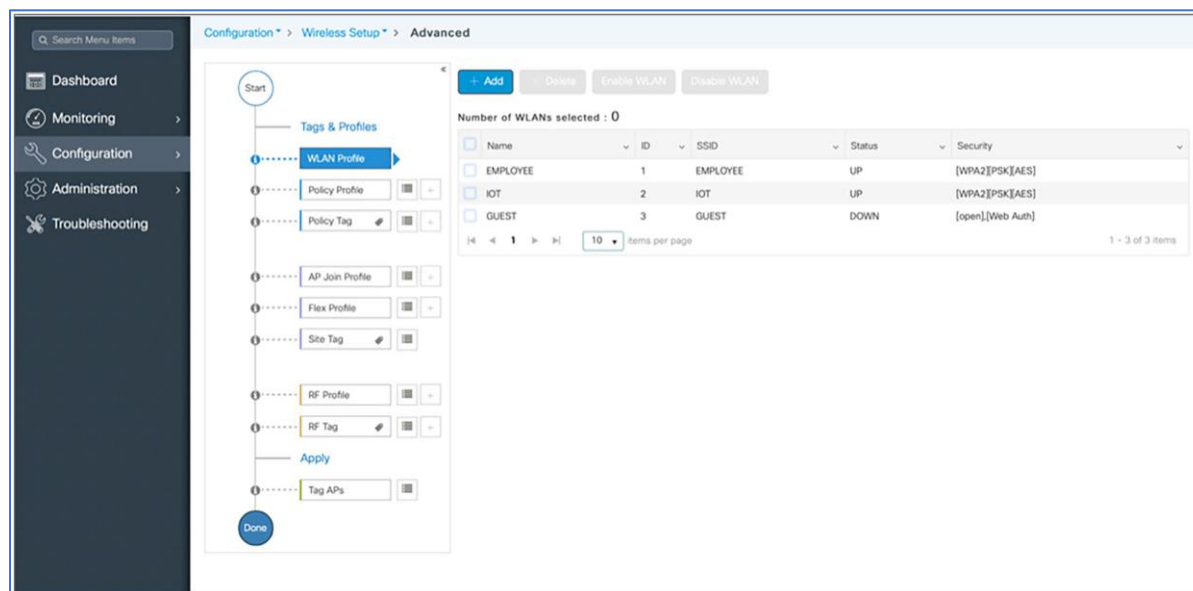
Access the wireless setup by clicking the Wireless Setup icon in the top right corner of the dashboard page.



A guided workflow has been created for easy navigation through the steps required to set up the network on the Cisco Catalyst wireless controllers.

Procedure

Choose Wireless Setup > Advanced, then, after reviewing the notes on this page, click **Start Now** to begin setting up the wireless network.



Note: The following set of steps defines the logical order of configuration. Apart from the WLAN profile, all profiles and tags have a default object associated with them.

1. Create profiles

- Create the required WLAN profiles (SSIDs)
- Create the policy profiles (if non-default needed)
- Create the RF profiles (if non-default needed)
- Create the site profile (if non-default needed)

2. Create tags

- Create the policy tag (if non-default needed) and map the SSIDs above to the policy profiles as required.
- Create the RF tag (if non-default needed) and add the RF profiles for 802.11a and 802.11b to it.
- Create the site tag (if non-default needed) and add the flex profile (if the site is a remote site) and the AP join profile (most cases will use the default)

3. Associate the tags to APs

If no custom tags are needed, this step is not required, as default tags are associated with the APs.

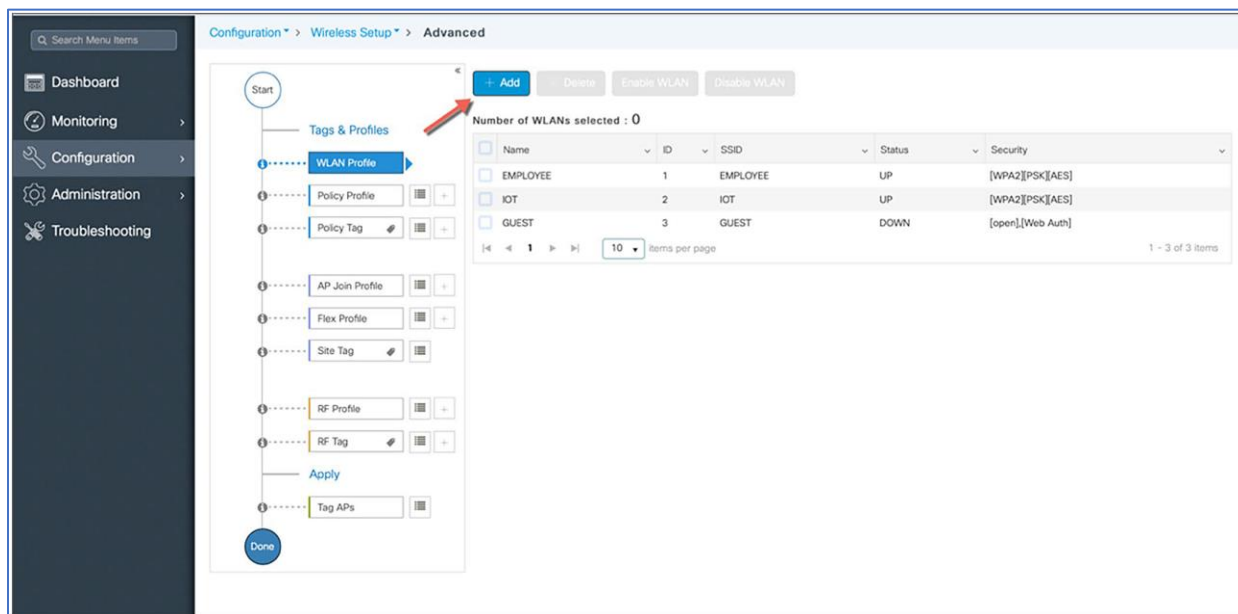
If the tag to be associated is non-default, associate it to the APs.

- Associate the RF tag to the AP or set of APs.
- Associate the policy tag to the AP or set of APs.
- Associate the site tag to the AP or set of APs.

Creating a WLAN profile

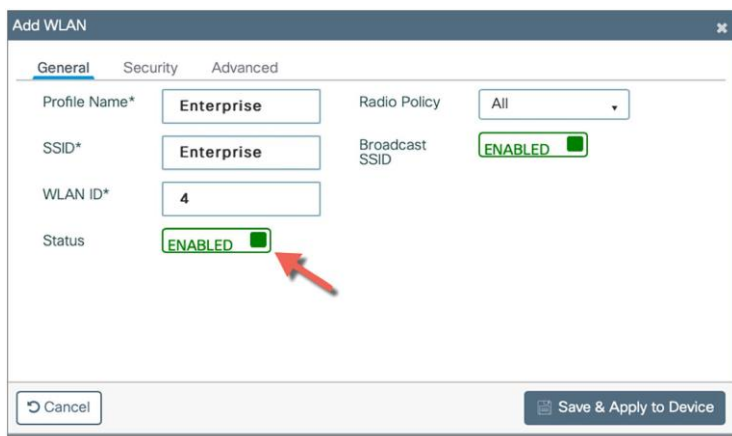
Begin the WLAN configuration by clicking the + sign next to the WLAN profile.

Click the **Add** button.



Note: SSIDs created during the day-0 flow will automatically show up on the WLAN profiles page.

Specify the profile name of your choice and a WLAN ID between 1 and 16, and set the Status toggle button to Enabled.



Adaptive 802.11r and other best practices are turned on by default.

Add WLAN

General **Security** Advanced

Layer2 Layer3 AAA

Layer 2 Security Mode: WPA + WPA2

MAC Filtering: ☐

Protected Management Frame

PMF: Disabled

WPA Parameters

Fast Transition: Adaptive Enabled

Over the DS: ☒

Reassociation Timeout: 20

Cancel Save & Apply to Device

Select PSK or 802.1X as the Authentication Key Management (AKM) on the Security tab. Click **Save and Apply to Device**.

Add WLAN

WPA2 Policy ☒

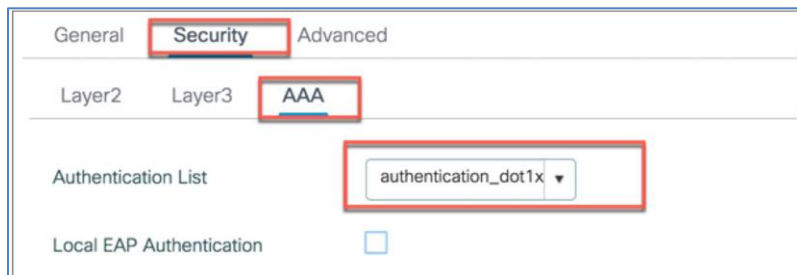
WPA2 Encryption: AES(CCMP128) ☒
CCMP256 ☐
GCMP128 ☐
GCMP256 ☐

MPSK: ☐

Auth Key Mgmt: 802.1x ☒
PSK ☐
CCKM ☐
FT + 802.1x ☐
FT + PSK ☐
802.1x-SHA256 ☐
PSK-SHA256 ☐

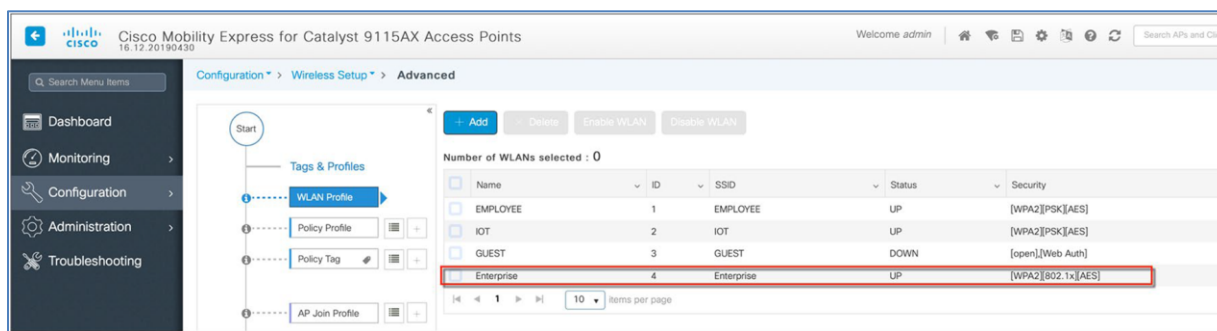
Cancel Save & Apply to Device

If 802.1X is selected, make sure you have added the AAA/RADIUS server. This can be done on day 0 through the configuration setup wizard or as part of day-1 configuration. If you configured the RADIUS server settings on day 0, it will automatically create a **RADIUS server (RADIUS_SERVER_DAY0_1)**, **RADIUS server group (RADIUS_SERVER_GROUP_DAY0)**, and **AAA method list name (authentication_dot1x_day0)**. This method list will appear in **WLAN > Security > AAA > Authentication List**.



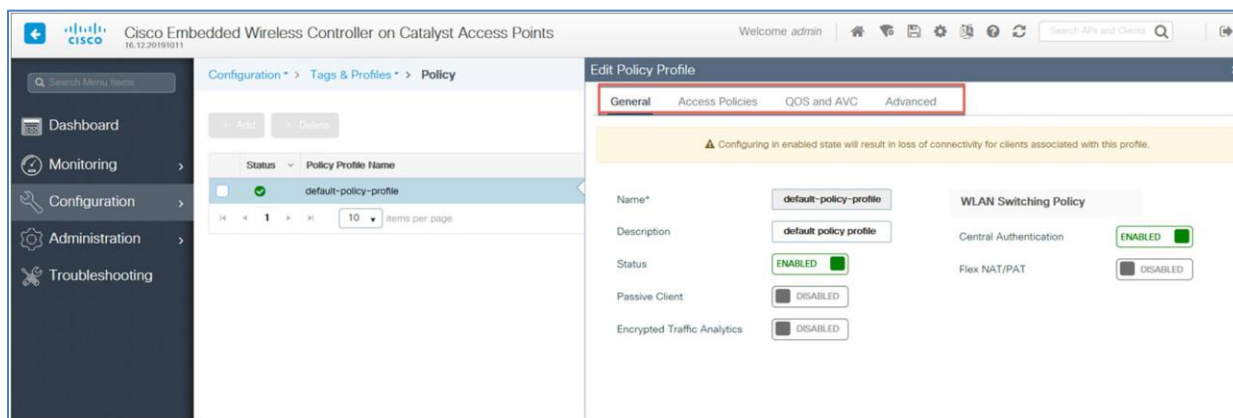
For day-1 RADIUS configuration, please refer to the “Configuring the AAA/RADIUS Server” section of this guide.

Verify that a WLAN profile is created as follows.



Policy profile

The default policy profile and default policy tag are preconfigured, so no specific policy configuration is required unless they need to be customized (for example, access policies, local switched VLAN, QoS, AVC, AAA override, etc)



You can configure the local switch VLAN under the option **Access Policies > VLAN > VLAN/VLAN Group**.

The screenshot shows the 'Edit Policy Profile' window with the 'Access Policies' tab selected. The 'VLAN/VLAN Group' dropdown menu is highlighted with a red box and contains the value '1'. Other visible fields include 'WLAN Local Profiling' (Disabled), 'Global State of Device Classification', 'HTTP TLV Caching', 'DHCP TLV Caching', 'WLAN ACL' (IPv4 and IPv6), 'URL Filters', 'Pre Auth', and 'Post Auth'.

You can also apply or pass some AAA attributes to the WLAN tied to a specific policy profile by selecting the **Allow AAA Override** option under **Advanced > AAA Policy**.

The screenshot shows the 'Edit Policy Profile' window with the 'Advanced' tab selected. The 'AAA Policy' section is visible, and the 'Allow AAA Override' checkbox is checked and highlighted with a red box. Other fields include 'WLAN Timeout' (Session, Idle, Client Exclusion), 'DHCP' (IPv4, Server IP), 'NAC State', 'Policy Name' (default-aaa-policy), and 'Accounting List'.

Policy tag

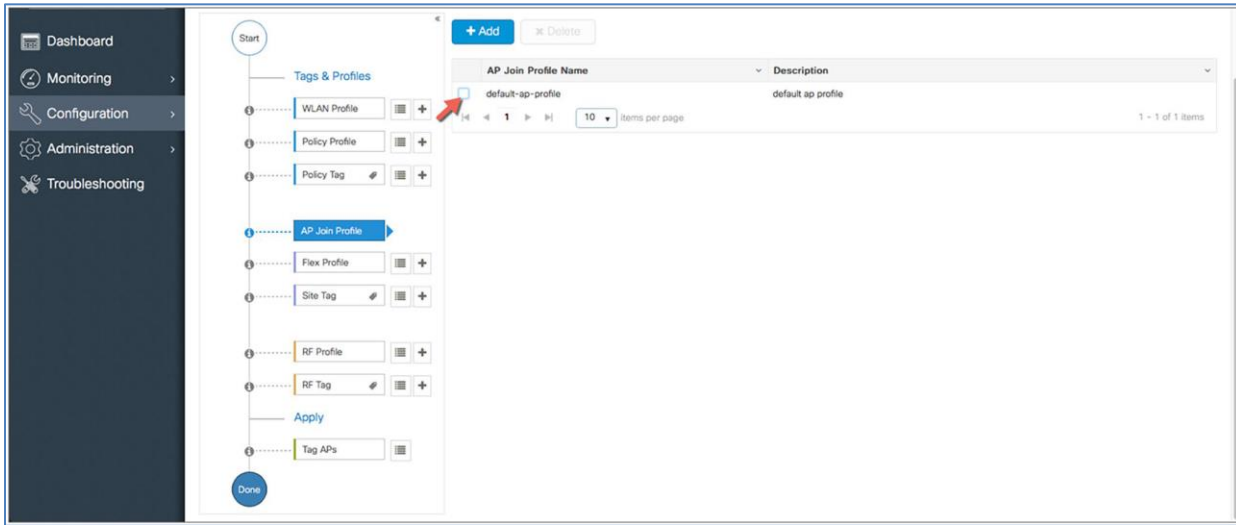
By default, WLAN IDs 1 through 16 are associated with the default policy tag. The SSID created in the first step is automatically added to this default policy tag, as shown below.

The screenshot shows the Cisco Mobility Express configuration interface. The 'Policy Tag' configuration is displayed, showing the 'default-policy-tag' selected. The 'WLAN-POLICY Maps' table lists the following mappings:

WLAN Profile	Policy Profile
EMPLOYEE	default-policy-profile
IOT	default-policy-profile
GUEST	default-policy-profile
Enterprise	default-policy-profile

The 'Enterprise' row is highlighted with a red box. The interface also shows a 'Tags & Profiles' section on the left with a red arrow pointing to the 'Policy Tag' entry.

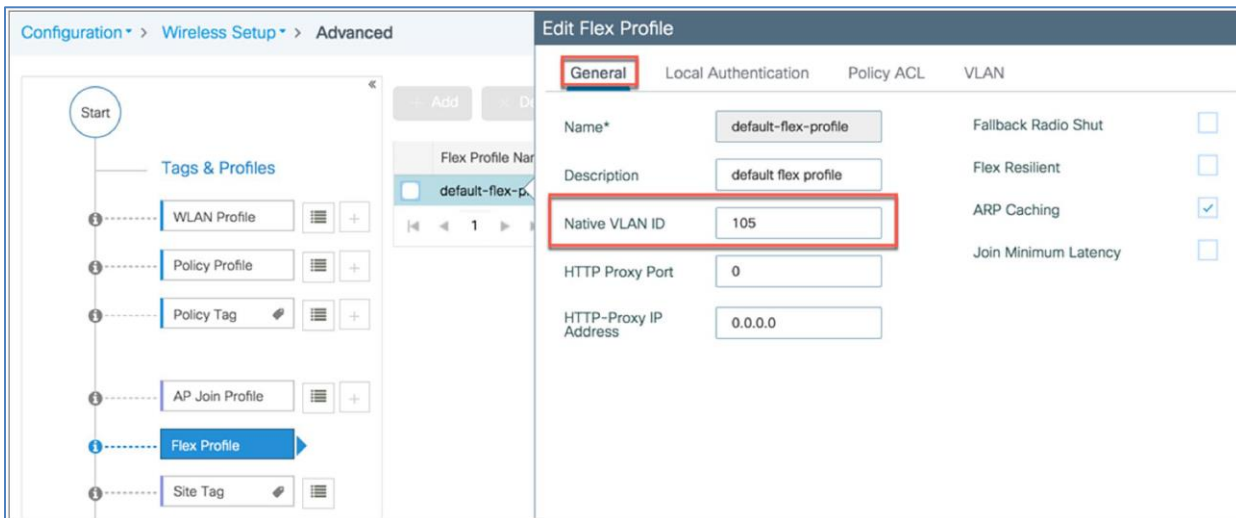
A default AP join profile and site tag are available automatically, so no specific site configuration is required. The EWC supports only one global site, which is the default site tag.



Flex profile

The flex profile is used for configuring the VLANs on the AP when the VLAN is overridden by the AAA that is used for the local switched SSIDs.

You can define the native VLAN for the flex profile.



You can also define the VLANs to be used for the local switched SSID. In this example we use VLAN 11, which is the local switched VLAN from the AP when using the AAA VLAN override option.

Add Flex Profile

General Local Authentication Policy ACL **VLAN**

+ Add ✕ Delete

VLAN Name	ID	ACL Name
No items to display		

VLAN Name* 11

VLAN Id* 11

ACL Name Select ACL

✓ Save Cancel

Cancel Save & Apply to Device

RF profile

A default RF profile and RF tag are preconfigured, so no RF configuration is required.

Dashboard Monitoring Configuration Administration Troubleshooting

Start

Tags & Profiles

- WLAN Profile
- Policy Profile
- Policy Tag
- AP Join Profile
- Flex Profile
- Site Tag
- RF Profile**
- RF Tag

Apply

- Tag APs

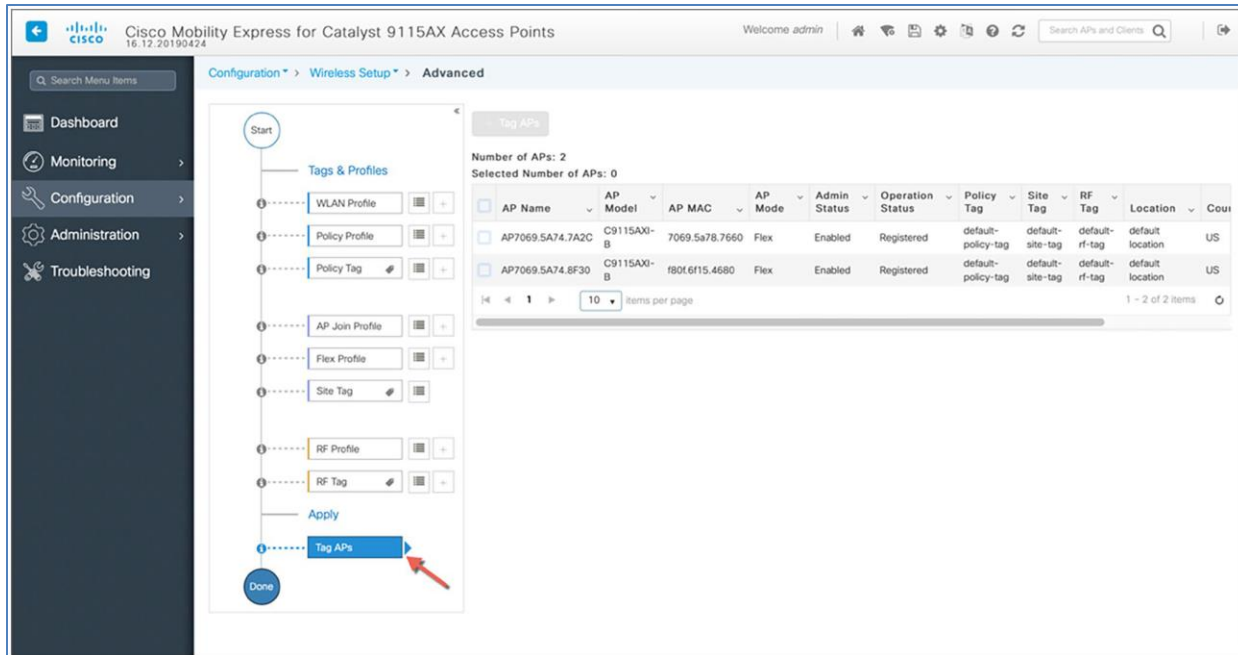
Done

+ Add ✕ Delete

RF Profile Name	Band	State	Description
☐ Low_Client_Density_rf_5gh	802.11a	Enable	pre configured Low Client Density rprofile for 5gh radio
☐ High_Client_Density_rf_5gh	802.11a	Enable	pre configured High Client Density rprofile for 5gh radio
☐ Low_Client_Density_rf_24gh	802.11b/g	Enable	pre configured Low Client Density rprofile for 2.4gh radio
☐ High_Client_Density_rf_24gh	802.11b/g	Enable	pre configured High Client Density rprofile for 2.4gh radio
☐ Typical_Client_Density_rf_5gh	802.11a	Enable	pre configured Typical Density rprofile for 5gh radio
☐ Typical_Client_Density_rf_24gh	802.11b/g	Enable	pre configured Typical Client Density rprofile for 2.4gh radio

1 - 9 of 9 items

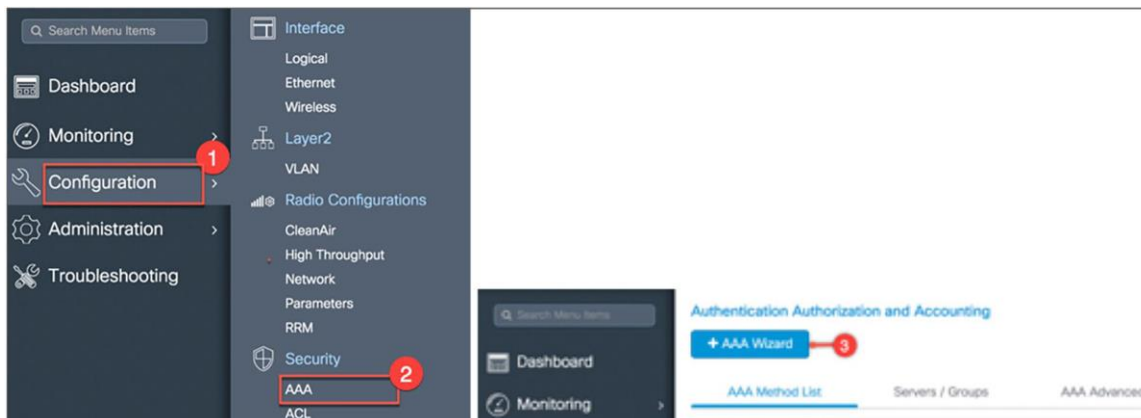
APs are tagged with the default policy, site, and RF tags automatically, so no explicit tagging is needed and the SSIDs (1 through 16) will start broadcasting across the network.



Configuring the AAA/RADIUS server

If the AAA server settings are not configured on day 0, you can add an AAA/RADIUS server using the following steps.

From the EWC main menu, go to **Configuration > Security > AAA** and then click **+AAA Wizard**.



Configure the following:

1. **RADIUS:** Name, server IP address, and key (shared secret). Click Next. In this example we name it "ISE."

SERVER SERVER GROUP ASSOCIATION MAP AAA

RADIUS ☒ TACACS+ ☐ LDAP ☐

RADIUS

Name* ISE

IPv4 / IPv6 Server Address* 10.10.105.36

PAC Key ☐

Key Type 0

Key* *****

Confirm Key* *****

Cancel Next →

2. **Server group association:** Configure the name of the server group, then from the **Available Servers** list, select the server you just created ("ISE" in this example). Click the > symbol to move it to the **Assigned Servers** list, and click **Next**.

Add Wizard

Basic Advanced

SERVER SERVER GROUP ASSOCIATION MAP AAA

RADIUS

Name* ISE-Server-Group

Group Type RADIUS

MAC-Delimiter

MAC-Filtering

Dead-Time (mins) 1-1440

Available Servers

Assigned Servers ISE

Previous Next →

3. **MAP AAA:** Select Authentication, then configure the Method List Name(if you do not want to use the default) and set the **Type** to **dot1x**, Under **Available Server Groups**, select the group you created. In this example we created ISE-Server-Group. If you are not using authorization, uncheck the Authorization box. Click **Apply to Device**.

Basic Advanced

SERVER SERVER GROUP ASSOCIATION MAP AAA

Authentication ☒ Authorization ☒ Accounting ☐

11 Authentication

Method List Name* ISE-ML 12

Type* dot1x 13

Group Type group

Fallback to local ☐

Available Server Groups Assigned Server Groups 14

radius
ldap
tacacs+ ISE-Server-Group

Previous Apply to Device

4. If you want to configure authorization, go to **Authorization** and select **Type = network**. Under **Available Server Groups**, select **ISE-Server-Group**, then click **Apply to Device**.

SERVER SERVER GROUP ASSOCIATION MAP AAA

Authentication ☒ Authorization ☒ Accounting ☐

15 Authorization

Method List Name* ISE-ML 16

Type* network 17

Group Type group

Fallback to local ☐

Available Server Groups Assigned Server Groups 18

radius
ldap
tacacs+ ISE-Server-Group

Previous Apply to Device 19

Managing the EWC network

Configuring management access using the GUI

The management access interface on the EWC controller is the default interface for in-band management of the controller and connectivity to enterprise services. It is also used for communications between the controller and access points. Go to **Administration > Management > HTTP/HTTPS/Netconf**.

HTTP access: To enable HTTP access mode, choose Enabled from the HTTP Access drop-down list. This allows you to access the controller GUI using `http://<ip-address>` through a web browser. Otherwise, choose Disabled.

The default value is Disabled. HTTP access mode is not a secure connection.

HTTPS access: To enable HTTPS access mode, choose Enabled from the HTTPS Access drop-down list. This allows you to access the controller GUI using `https://<ip-address>` through a web browser. Otherwise, choose Disabled.

The default value is Enabled. HTTPS access mode is a secure connection.

Similarly, The HTTP trust point is enabled by default. Also, Netconf is enabled by default with default port number 830.

The screenshot shows the 'Administration > Management > HTTP/HTTPS/Netconf' configuration page. It is divided into four main sections: HTTP/HTTPS Access Configuration, Timeout Policy Configuration, HTTP Trust Point Configuration, and Netconf Yang Configuration. Each section contains various settings, many of which are enabled by default.

HTTP/HTTPS Access Configuration		Timeout Policy Configuration	
HTTP Access	ENABLED	HTTP Timeout-policy (secs)	180
HTTP Port	80	Session Idle Timeout (secs)	600
HTTPS Access	ENABLED	Server Life Time (secs)	180
HTTPS Port	443	Max Number of Requests	25
Personal Identity Verification	DISABLED		

HTTP Trust Point Configuration	
Enable Trust Point	ENABLED
Trust Points	CISCO_IDEVID_SUDI

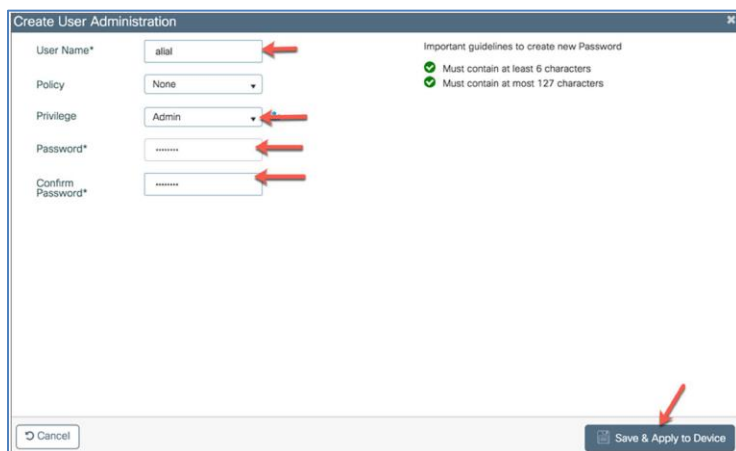
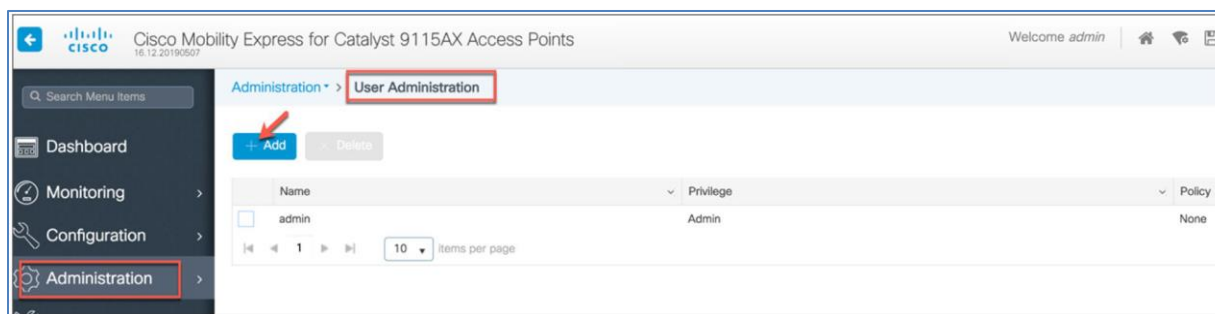
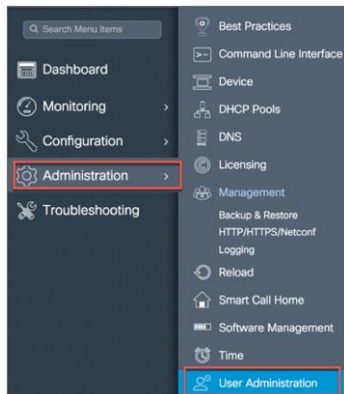
Netconf Yang Configuration	
Status	ENABLED
SSH Port	830

An 'Apply' button is located in the top right corner of the configuration area.

Managing administrator accounts

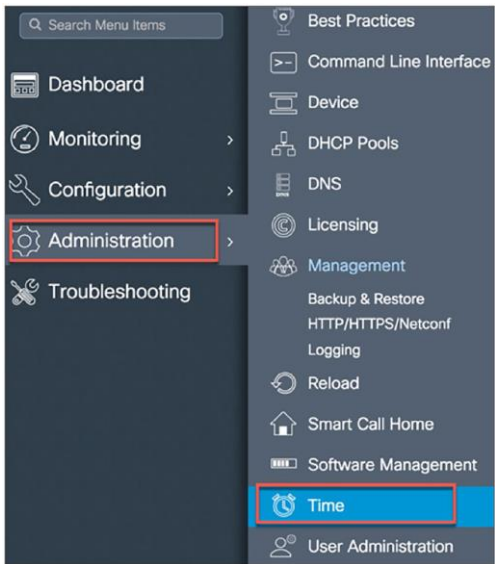
You can configure administrator usernames and passwords to prevent unauthorized users from reconfiguring the controller and viewing configuration information.

The administrator user accounts are required for logging into the EWC controller to monitor and configure the wireless network. They can be configured with read/write or read-only privileges by going to the WLC main menu and then choosing **Administration > User Administration > Add**.

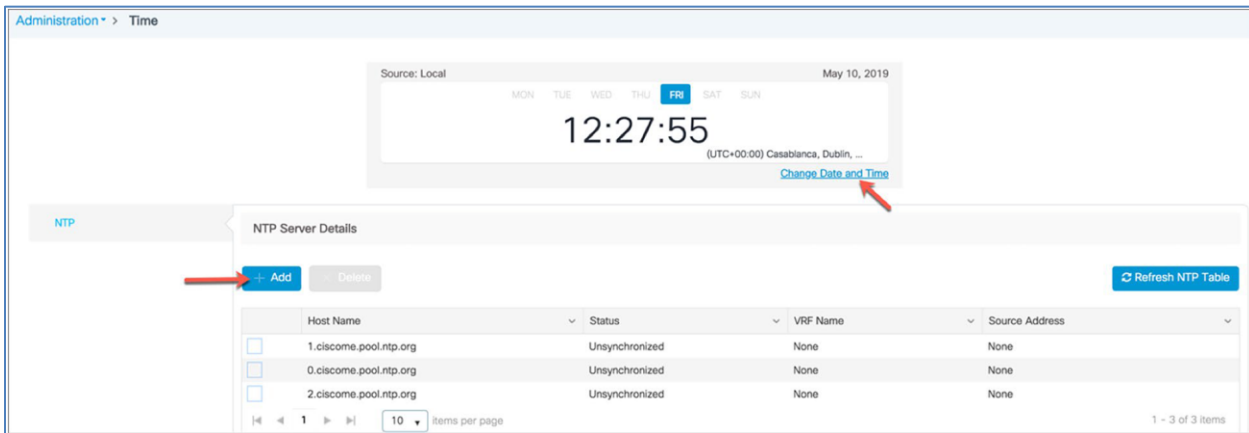


Managing time on the EWC

The system date and time on the Cisco EWC are first configured when you run the initial wireless express setup wizard. You can change or configure the time from the WLC menu by choosing **Administration > Time**.



A Network Time Protocol (NTP) server can be configured to synchronize date and time if one was not configured during the wireless express setup. Greenwich Mean Time (GMT) is used as the standard for setting the time zone on the controller. You can also update or add the specific NTP server to EWC.



Updating Cisco EWC software

Cisco Catalyst EWC software updates can be performed using the controller's web interface. Software updates help ensure that both the controller software and all the associated APs are updated. The APs that have older software are automatically upgraded to the EWC software upon joining the primary AP. An AP joining the controller compares its software version with the primary AP version and, in case of a mismatch, the new AP requests a software upgrade. The primary AP facilitates the transfer of the new software from the TFTP server to the new AP.

Both the Cisco Catalyst 9115AX and 9120AX Series access points share the same AP image file – ap1g7 – while the 9117AX Series image is ap1g6 and C9130 Series AP image is ap1g6a, which is included as part of the **C9800-AP-universalk9.<version>.zip** file. For HTTP transfer mode, specify the path to the access point image file on your local machine.

The active AP facilitates the transfer of the image from the TFTP server to the subordinate APs. The AP images are stored and served from the TFTP server upon request.

Before you upgrade the EWC network, ensure that the following prerequisites are met:

Prerequisites for HTTP software update

- The network should be homogeneous, meaning that all APs have a same ap image type. Otherwise, TFTP/SFTP download is required.
- The AP bundle with individual AP images (ap1g6, ap1g6a, ap1g7, ap3g3, etc.) and WLC image (C9800-AP-iosxe-wlc.bin) downloaded from Cisco.com is unzipped and copied onto the local machine.
- The unzipped EWC image folder and mapping of AP models to AP image are shown below for your reference.

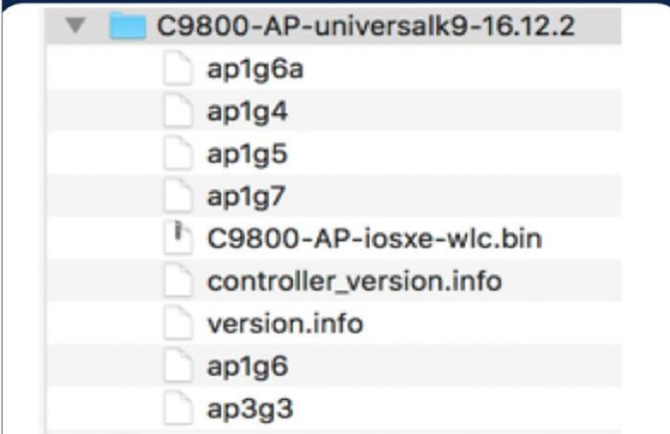
AP images and WLC image after unzipping C9800-AP<version>.zip		AP Model	AP Image
		C9115AX	ap1g7
		C9117AX	ap1g6
		C9120AX	ap1g7
		C9130AX	ap1g6a
		AIR-AP1815	ap1g5
		AIR-AP1832	ap1g4
		AIR-AP1840	ap1g5
		AIR-AP1852	ap1g4
		AIR-AP2802	ap3g3
		AIR-AP3802	ap3g3
		AIR-AP4802	ap3g3
		AIR-AP1542	ap1g5
		AIR-AP1562	ap3g3

Figure 5.
Mapping of AP images to AP models

Prerequisites for TFTP software update

- A TFTP server is reachable from the management IP address of the EWC.
- The upgrade bundle with AP images (ap1g6, ap1g6a, ap1g7, ap3g3, etc.) and WLC image (C9800-AP-iosxe-wlc.bin) downloaded from Cisco.com is unzipped and copied onto the TFTP server. The unzipped EWC image folder and mapping of AP models to AP image are shown below for your reference.

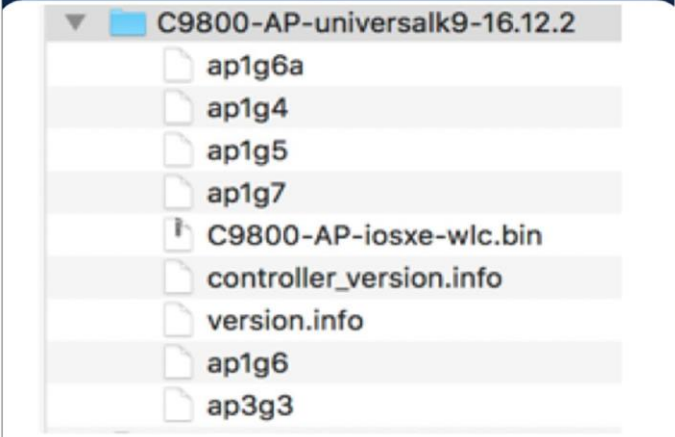
AP images and WLC image after unzipping C9800-AP<version>.zip		AP Model	AP Image
		C9115AX	ap1g7
		C9117AX	ap1g6
		C9120AX	ap1g7
		C9130AX	ap1g6a
		AIR-AP1815	ap1g5
		AIR-AP1832	ap1g4
		AIR-AP1840	ap1g5
		AIR-AP1852	ap1g4
		AIR-AP2802	ap3g3
		AIR-AP3802	ap3g3
		AIR-AP4802	ap3g3
		AIR-AP1542	ap1g5
		AIR-AP1562	ap3g3

Figure 6.
Mapping of AP images to AP models

Software update sequence

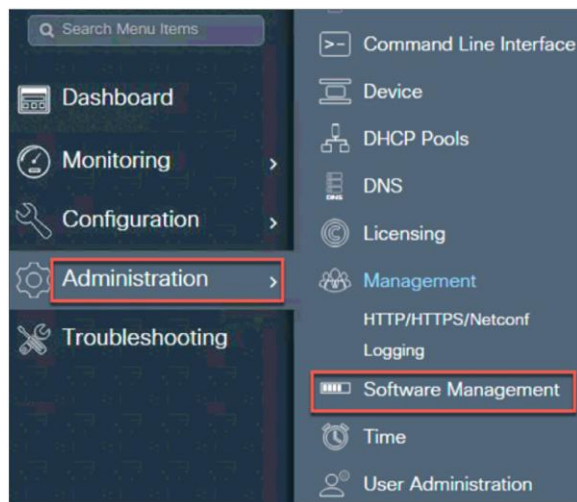
Download the **C9800-AP-universalk9<version>.zip** file from Cisco.com. For HTTP transfer mode, download the file to the local machine that is being used to access the EWC web UI. For TFTP transfer mode, download the zip file to the device running the TFTP server.

- Unzip the file to extract the AP images.
- Select HTTP, TFTP, or SFTP as the transfer mode, and configure the corresponding parameters on the software upgrade page.
- Initiate image predownload on the EWC network.
- Activate and reboot the EWC and associated access points.

To begin the software update, perform the following steps:

HTTP download procedure

- Step 1.** Download the **C9800-AP-universalk9<version>.zip** file from the beta site to the local machine (unzipped file).
- Step 2.** From the WLC main menu, go to **Administration > Software Management > Software Upgrade**.



- Step 3.** From the **Mode** drop-down menu, select **Desktop (HTTP)**.

For the **Controller Image** option, click **Select File**, which will open your local machine drive. Choose the **C9800-AP-iosxe-wlc.bin** file.

For the AP Image option, click **Select File**, which will open your local machine drive, and then select the AP image file.

Click **Save and Download**. Remain on the page until the green progress bar for the controller and AP image shows that it is complete.



- Step 4.** Check the software upgrade status, which will show update messages regarding the AP and controller images. The options (Save, Save and Download, and Activate) will be grayed out.

Mode: Desktop (HTTP)

Controller Image*
 Select File
 C9800-AP-iosxe-wlc.bin ✓
 Required image is C9800-AP-iosxe-wlc.bin*

AP Image*
 Select File
 ap1g7 ✓
 Required AP image is ap1g7*

Please stay on this page till controller and AP image download completes

Save Save & Download Activate Cancel

Software Upgrade Status

Initiate ● Controller Image Download ● AP Image Download ● Network Upgrade ● Activate ● Reload ●

Status: Extracting controller and AP version info files from downloaded image

Step 5. Once the software upgrade status shows the message “**Controller Image Predownload to EWC Capable APs Complete,**” click the Activate button to initiate the software.

Save Save & Download **Activate** Cancel

Software Upgrade Status

Initiate ● Controller Image Download ● AP Image Download ● Network Upgrade ● **Activate ●** Reload ●

Status: Controller Image Predownload to EWC Capable APs Complete. To trigger network upgrade click on Activate.

Show Install Logs >>

AP Name	Primary Image	Backup Image	Predownload Status	Predownload Version	Next Retry Time	Retry Count
AP2CF8.9B5F.D0EC	16.12.1.20	16.12.1.23	Complete	16.12.1.23	0	0
AP7069.5A74.8FD4	16.12.1.20	16.12.1.23	Complete	16.12.1.23	0	0

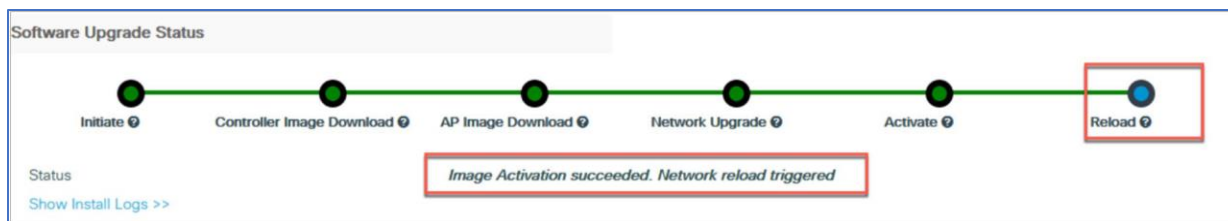
1 - 2 of 2 items

A warning window will pop up, letting you know that this will cause the device to reboot.

Click Yes and the EWC will reload and will come back up with the updated software.

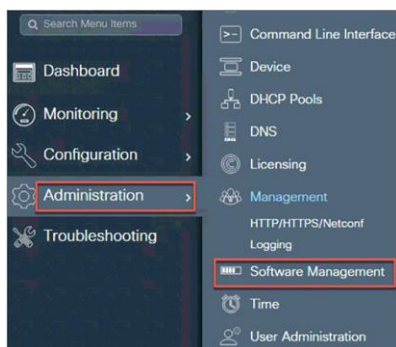
Device will reload whole network and it will take some time to upgrade after activate is triggered. Do you want to activate?

No Yes



TFTP download procedure

- Step 1.** Download the **C9800-AP-universalk9.<version>.zip** file from the beta site to the TFTP server (unzipped file).
- Step 2.** From the WLC main menu, go to **Administration > Software Management > Software Upgrade**.



- Step 3.** From the Mode drop-down menu, select **TFTP**.
- Select the image server IP address (TFTP server IP address)
- Define the path. Use a period (.) if a TFTP directory is already set up on the TFTP server.
- Click Save and Download to start the software upgrade.

Administration > Software Management

Software Upgrade

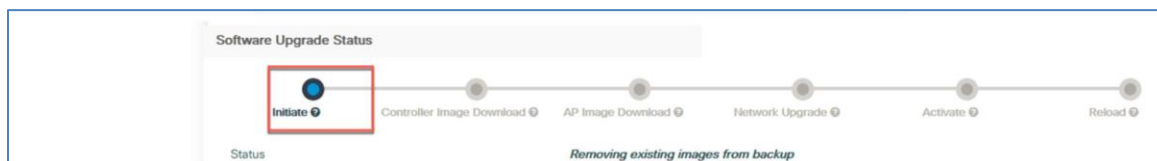
SMU (Beta)

Mode: tftp

Image Server*: 10.10.105.15

Image Path*: /

Save Save & Download Activate Cancel



- Step 4.** Once the software upgrade status shows the message **“Controller Image Predownload to EWC Capable APs Complete,”** click the Activate button to initiate the software.

Mode:

Image Server*:

Image Path*:

Software Upgrade Status

☐ Initiate ?
 ☐ Controller Image Download ?
 ☐ AP Image Download ?
 ☐ Network Upgrade ?
 ☒ Activate ?
 ☐ Reload ?

Status: *Controller Image Predownload to EWC Capable APs Complete. To trigger network upgrade click on Activate.*

Show Install Logs >>

Total number of AP	2
Initiated	0
Predownloading	0
Completed predownloading	3
Failed to predownload	0

AP Name	Primary Image	Backup Image	Predownload Status	Predownload Version	Next Retry Time	Retry Count
BR2-EWC-AP1-1568	16.12.1.16	16.12.1.23	Complete	16.12.1.23	0	0
BR2-EWC-AP2-257C	16.12.1.16	16.12.1.23	Complete	16.12.1.23	0	0

1 - 2 of 2 items

Device will reload whole network and it will take some time to upgrade after activate is triggered. Do you want to activate?

Software Upgrade Status

☐ Initiate ?
 ☐ Controller Image Download ?
 ☐ AP Image Download ?
 ☐ Network Upgrade ?
 ☐ Activate ?
 ☒ Reload ?

Status: *Image Activation succeeded. Network reload triggered*

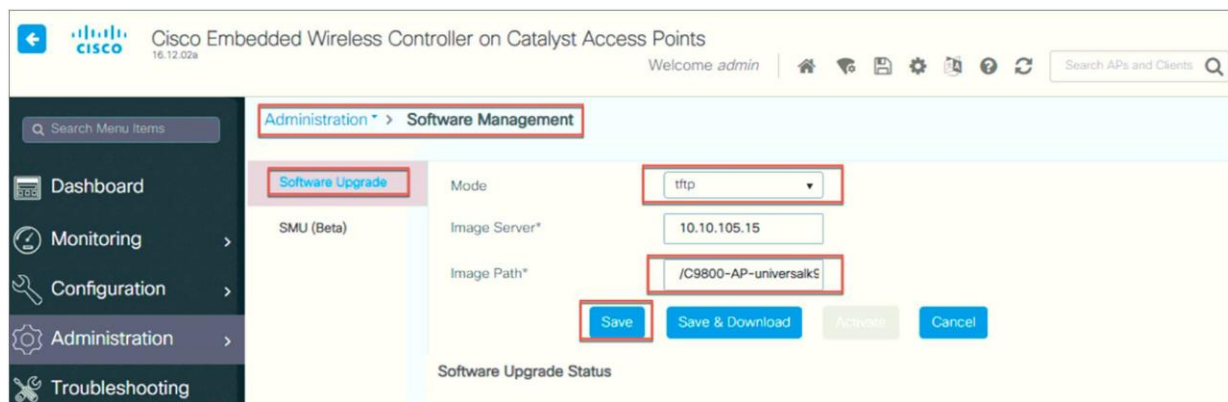
Show Install Logs >>

AP image download profile for heterogeneous network

If the AP being added to the EWC network is the same model and image as the active EWC, you do not need any external server to host the code. If the AP model and image are different from the active AP, you need to have an external server to host the code so the APs can download the code at the time of joining.

For example, in an EWC network, if the active EWC is a 9120AX and the subordinate APs are 9115AX, 9117AX, and 9130AX models, you need to set up an external server to host the code so that the 9117AX and 9130AX APs can download the code for the server.

From the WLC main menu, go to **Administration > Software Management > Software Upgrade**. Select TFTP for the transfer mode, configure the SFTP or TFTP parameters, and save the profile by clicking **Save**.



Using advanced settings

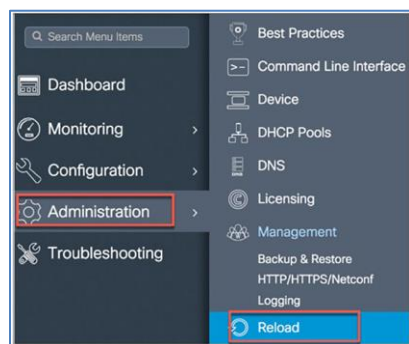
Logging

The System Message logging feature logs system events to a remote server called a syslog server. Each system event triggers a syslog message that contains the details of the event.

If the System Message logging feature is enabled, the controller sends a syslog message to the syslog server that is configured on the controller.

Reset to factory default

You can return the EWC network to its default configuration by resetting it to the factory default.



Administration > Reload

☒ Save Configuration and Reload.
 ☐ Reload without Saving Configuration.
 ☐ Reset to Factory Default and Reload.

Apply

Wireless advanced settings

You can also configure advanced parameters such as load balancing, band select, and optimized roaming from the WLC main menu by navigating to **Configuration > Wireless > Advanced**.

Cisco Mobility Express for Catalyst 9115AX Access Points

Configuration > Wireless > Advanced

Load Balancing Band Select Optimized Roaming High Density Preferred Calls

5 GHz Band 2.4 GHz Band

Aggressive Load Balancing Window (clients)* 5 5

Aggressive Load Balancing Denial Count* 3 3

Statistics

Total Denied Count (clients)	0	Total Denial Sent (messages)	0
Exceeded Denial Max Limit Count	0	None 5G Candidate Count (times)	0
None 2.4G Candidate Count (times)	0	Total Other Roam Attempts	0

EWC HA active and standby

The Cisco Catalyst EWC is supported on Cisco Catalyst 9100 Access Points, and the active AP election process determines which 9100 AP will be elected to run the EWC function. Once the active AP is elected and other subordinate EWC-capable 9100 APs are joined to it, it selects a standby AP and redundancy is formed.

This High Availability (HA) architecture is based on the Cisco Catalyst 9800 HA architecture, with a few additions:

HA pairing will be different. For the initial bring-up, the EWC active will wait until all APs join. It then selects the designated standby (via either auto-selection or configuration) and communicates that role and the HA parameters (local/peer IP, keepalive interval, priority, etc.) to the selected AP via a CAPWAP control message.

The selected standby AP starts up and dynamically configures the HA parameters without manual intervention.

To view the redundancy between active and standby, access the EWC GUI.

Go to **Monitoring > System > Redundancy**.

Monitoring > General > System

Memory Utilization CPU Utilization Wireless Interface Management Summary Redundancy

IOS Daemon Memory Usage [IOSD Memory Dump](#)

Memory Details	size (B)
Free	268548208
Used	70074788
Total	338622996

Slot: [Control Plane Data](#)

From the General tab, you can view the active and standby mode and details.

Memory Utilization CPU Utilization Wireless Interface Management Summary Redundancy

General Active Statistics Standby Statistics

My State: ACTIVE
Peer State: STANDBY HOT
Unit ID: 1
Redundant Mode (Operational): sso
Redundancy Mode(Configured): sso

Redundancy State: sso
Manual Swact: enabled
Communications: Up
Standby Failures: 1
Switchovers System Experienced: 0

Chassis Details

Chassis	Role	MAC Address	Priority	H/W Version	Current State	IP Address	Mobility MAC Address	Image Version	Device Uptime
*1	Active	7069.5a74.8fcc	1	V01	Ready	10.10.10.1	0000.5e00.0101	16.12.20190507:000947	5 days, 3 hours, 29 minutes
2	Standby	7069.5a76.5310	1	V02	Ready	10.10.10.2	0000.5e00.0101	16.12.20190507:000947	2 hours, 14 minutes

1 - 2 of 2 items

Active EWC election process

The EWC election process is used to choose the AP on which the controller is started. We use Virtual Router Redundancy Protocol (VRRP) to elect the active AP. The logic used to elect the active and standby EWC is described below.

Active EWC selection

The following algorithm is used to compare two APs.

- If you have configured an AP to be a preferred controller, it takes the highest precedence.
- The next AP type is compared. APs with higher model numbers will have higher values. The AP having the highest value will become the active.
- If the APs have the same AP type, the client load (number of associated clients) is compared and the AP with the smallest load is selected.
- If all of the above fails (all are equal among the APs), the AP with the lowest MAC address becomes the active.

Standby EWC selection (on day 1 only)

The standby EWC is not selected using VRRP. It is selected as follows.

- After the active EWC is selected, it will wait until the external APs join to begin standby election.
- Once the external APs join, the active will assign a priority to all joined APs. The AP with the highest priority will be selected as the standby. If multiple APs have the same highest priority, the AP with the lowest MAC address gets selected. Only EWC-capable APs with an EWC image installed can participate in the election.
- Priority is calculated based on the following parameters:
 - Explicit user configuration: Choose a particular AP as the next preferred controller (highest priority)
 - AP type
 - AP join time

Day 0 vs. day 1

There is no concept of standby on day 0. On day 0, you will have only one active EWC. If the active EWC goes down for some reason, VRRP election will take place again, to elect a new EWC.

Note: Once a controller is running on an AP, it will always have a higher priority than other APs not running as the controller. For example, if you bring up one 9115AX Series AP, since there is no other AP to choose from, it will become the active and start controller. If you then bring up a 9117AX Series AP on this network, although the 9117AX is a higher model number, it will not become the controller, since you already have a controller running in the network. Election will kick in only if you bring up two APs at the same time.

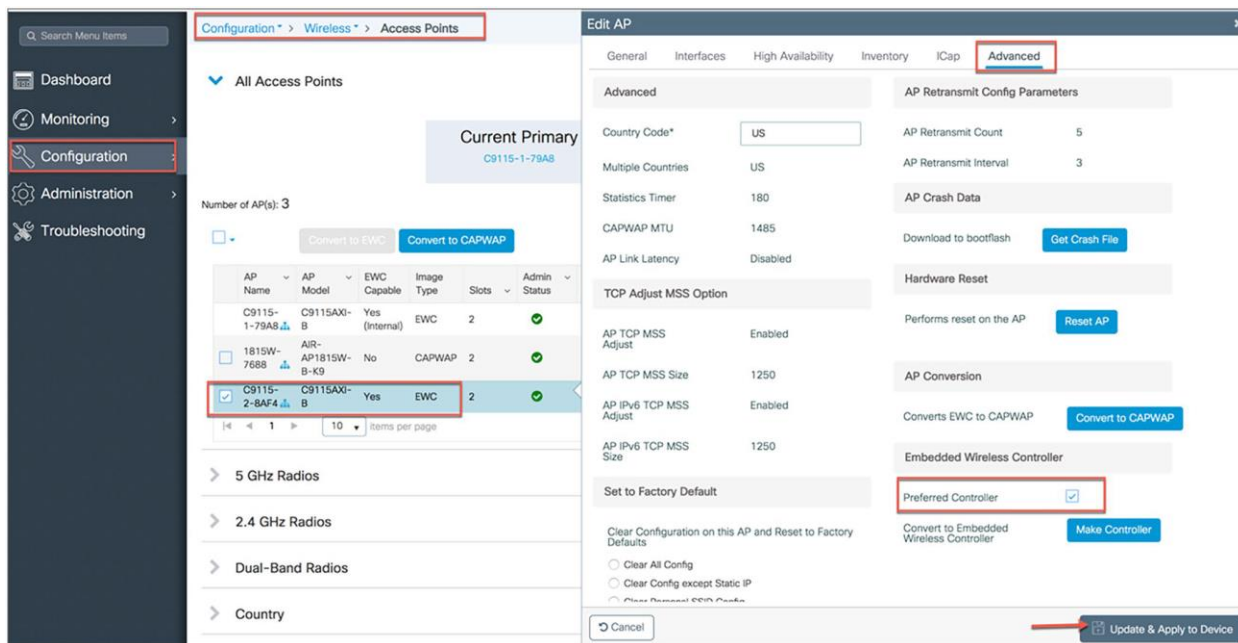
Preferred controller selection (new standby EWC)

The active and standby EWCs are elected by the process described above. But if for some reason you want to select another AP as the standby, you can select any EWC-capable AP as a preferred controller.

Note: When you select another AP that is not the current standby to be the preferred controller, the current standby goes down and the new EWC you have selected becomes the standby EWC.

Step 1: Select the EWC AP that you want to be a preferred controller.

Step 2: Go to the AP's Advanced tab and, under Embedded Wireless Controller, select Preferred Controller and click Update and Apply to Device.



Make Controller option (selecting a new active EWC)

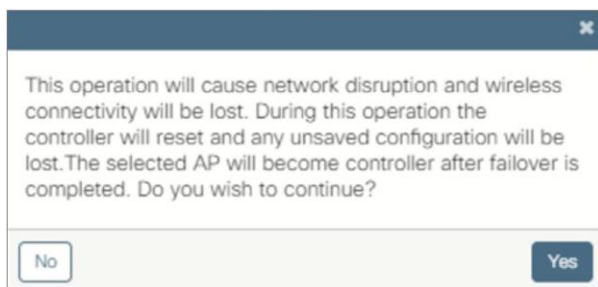
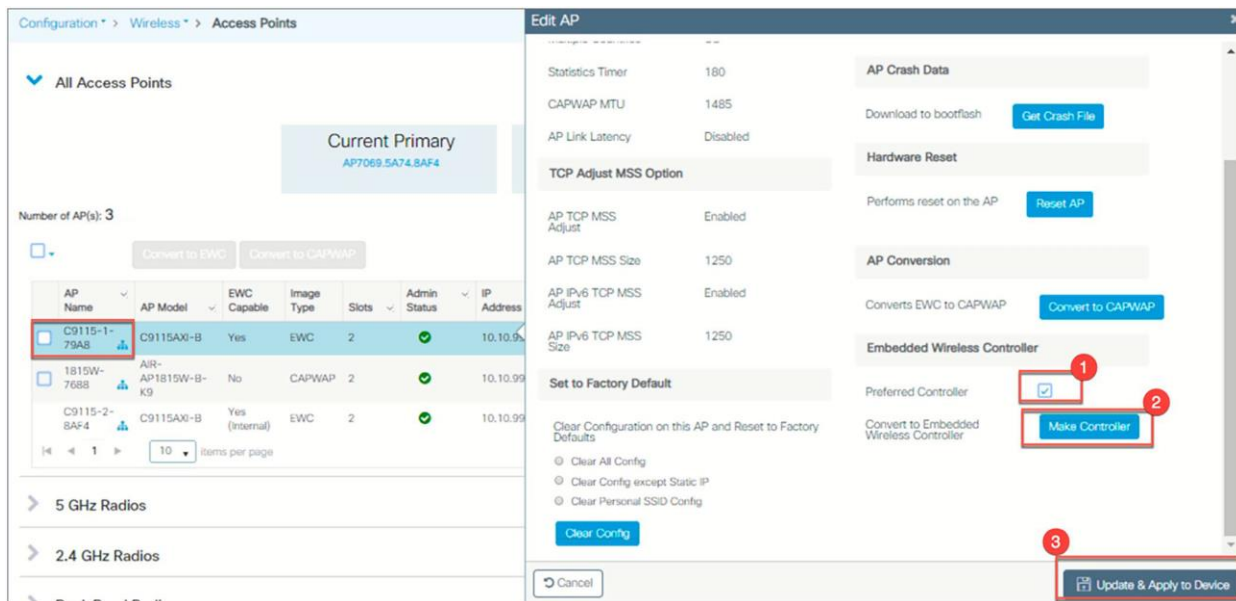
The active EWC and standby EWC are elected by the process described above. But if for some reason you want to select another AP to be the active EWC, you can do so with the Make Controller option. You need to configure it as a preferred controller first before using this option. When you select an AP that is not the current active EWC to become the controller, the new AP becomes the active EWC after a reload, and the current EWC will become the new standby.

Step 1: Select the EWC AP that you want to be a preferred controller.

Step 2: Go to the AP's Advanced tab and, under the Embedded Wireless Controller option, select Preferred Controller and click Update and Apply to Device.

Step 3: Go back to the EWC AP Advanced tab and click Make Controller, then click Update and Apply to Device.

Note: There will be a warning message that this operation will disrupt the network, as the controller will reset.



Conversion

Note: Conversion from CAPWAP to EWC is supported from AireOS 8.10.105.0 or Cisco IOS XE 16.12.2s. The AP must have the 8.10.105.0 or 16.12.2 CAPWAP image or later on the 9100 access point before you can convert it to EWC.

The Cisco Catalyst 9100 Access Point is capable of operating as a CAPWAP AP or EWC-capable AP (runs the controller function in an EWC network), managing other access points as well as serving clients.

The following conversion is supported:

Converting a CAPWAP AP to an EWC-capable AP: This conversion is required when you have a 9100 access point running an 8.10.X or 16.12.X CAPWAP image, and you want to use it to deploy a EWC network. For this, you would convert the CAPWAP AP to a active EWC AP (runs the controller function in an EWC network).

The Cisco Catalyst 9100 Access Points support two different images:

CAPWAP image: When a CAPWAP image is installed on an access point, it can operate only as a CAPWAP access point and does not support the controller function.

EWC image: When an EWC image is installed on an access point, it can operate as both a controller and an access point or as an access point alone.

To determine the image and capability on the access point, you can do a show version command on the AP CLI to determine the AP image type and AP configuration:

If the show version command does not display the AP image type and AP configuration parameters, it means the AP is running the CAPWAP image.

If the show version command displays the AP image type as EWC IMAGE and the AP configuration as EWC CAPABLE, it operates as both a controller and an access point. It participates in the active election process in case of a failover.

If the show version command shows the AP image type as EWC IMAGE and the AP configuration as NOT EWC CAPABLE, it operates only as an access point and does not participate in the active election process in case of a failover.

The following is sample input from the show version command:

```
Cisco C9117AXI-B with 1927052/380724K bytes of memory.
Processor board ID KWC224709BU
AP Running Image      : 16.12.2
Primary Boot Image    : 16.12.2
Backup Boot Image     : 8.10.105.5
Primary Boot Image Hash:
Backup Boot Image Hash:
AP Image type         : EWC IMAGE
AP Configuration      : EWC CAPABLE
1 Gigabit Ethernet interfaces
2 802.11 Radios
Radio FW version : QC_IMAGE_VERSION_STRING=WLAN.HK.1.0-03095-QCAHKSUPL_SILICONZ-
1.198262.4.200256.9
```

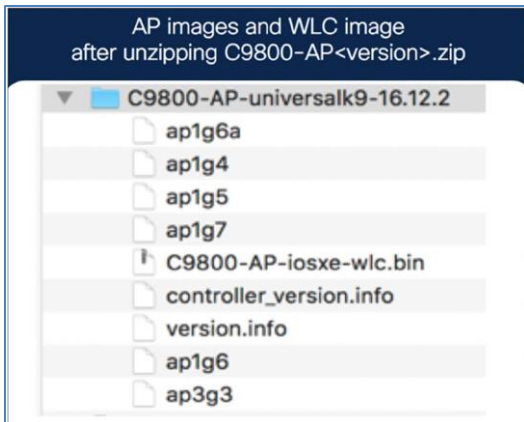
```
NSS FW version : NSS.HK.H.CS.q_len512-E_custC
cisco C9117AXI-B with 1927052/1296108K bytes of memory of memory.
Processor board ID RFDP2BCR021
AP Running Image : 16.12.2
Primary Boot Image : 16.12.2
Backup Boot Image : 8.10.105.5
AP Image type : EWC IMAGE
AP Configuration : NOT EWC CAPABLE
2 Gigabit Ethernet interfaces
2 802.11 Radios
Radio FW version : 1401b63d121b073a3008aa67f0c039d0
NSS FW version : NSS.AK.1.0.c4-00026-E_cust C-1. 24160.1
```

Converting a CAPWAP AP to an EWC AP

To convert an access point running a CAPWAP image into an EWC-capable access point, you have to download and install the EWC image from a TFTP server. A single command has been provided to download the EWC image from a TFTP server and convert the AP configuration to EWC CAPABLE.

Prerequisites for converting a CAPWAP AP to EWC

- A TFTP server with the EWC image file unzipped. The unzipped file has the EWC image C9800-AP-iosxe-wlc.bin and respective AP images (ap1g6, ap1g6a, and ap1g7).



AP Model	AP Image
C9115AX	ap1g7
C9117AX	ap1g6
C9120AX	ap1g7
C9130AX	ap1g6a

- A DHCP server to assign an IP address to the Cisco Catalyst 9100 Access Point.
- The 9100 access point must not join any existing controller in the network when you are trying to load the EWC image. If you have an existing controller on your network that the AP can join, conversion will not be successful.

To convert an AP running a CAPWAP image to EWC, perform the following steps:

Procedure

- Step 1.** Connect and log in to the Cisco Catalyst 9100 Access Point CLI or console.
- Step 2.** Enter **enable** to go to privileged execution mode.
- Step 3.** Enter **show version** on the access point CLI. From the show version output, you can determine the AP image type and AP configuration and can then proceed with the conversion process.
- Step 4.** If the AP image type and AP configuration are not available in the show version output, it means the AP is running a CAPWAP image. To do the conversion, execute the command below:

AP#ap-type EWC tftp://<TFTP Server IP>/< ap image> tftp://<TFTP Server IP>/< WLC image>

Example: AP#ap-type EWC tftp://10.10.10.15/ap1g7 tftp://10.10.10.15/C9800-AP-iosxe-wlc.bin
- Step 5.** After the AP reboots, the EWC starts in day 0 and CiscoAirProvision-<MAC> SSID is broadcast. You can then configure it from the wireless configuration wizard.

Converting an EWC AP to a CAPWAP AP from the web UI

There are two reasons to convert an EWC-capable AP to a CAPWAP AP:

- If you want to migrate the 9100 access points from an EWC network to another controller (not EWC) network.
- If you do not want the 9100 access points to participate in the active AP election process in an EWC network.

When the AP type is CAPWAP, the AP doesn't have the controller function and cannot participate in the active AP election process.

After changing the AP type, if this AP is migrated to a non-EWC network, it joins the controller in that network. If the image on that controller is different from the one on the AP, a new CAPWAP image is requested from the controller.

When the AP type is CAPWAP (as required for this conversion), the AP doesn't start its own controller function, and when the AP joins the external controller, a new image is requested from the controller and the AP gets the CAPWAP image.

To convert an EWC AP into a CAPWAP AP, perform the following steps:

Procedure

Step 1: Go to **Configuration > Wireless > Access Points** and view the APs. The image type shows whether the AP is CAPWAP or EWC.

Configuration > Wireless > Access Points

All Access Points

Current Primary: C9115-1-79A8
Current Standby: Not Applicable
Preferred Master: Not Configured

Number of AP(s): 3

Convert to EWC Convert to CAPWAP

AP Name	AP Model	EWC Capable	Image Type	Slots	Admin Status	IP Address	Base Radio MAC	AP Mode	Operation Status	Policy Tag	Site Tag	RF Tag	Tag Source
C9115-1-79A8	C9115AXI-B	Yes (Internal)	EWC	2	✓	10.10.99.89	7069.5a78.7240	Flex	Registered	default-policy-tag	default-site-tag	default-rf-tag	Loc
1815W-7688	AIR-CT5502-K9	No	CAPWAP	2	✓	10.10.99.110	7070.8b7c.f2e0	Flex	Registered	default-policy-tag	default-site-tag	default-rf-tag	Def
AP7069.5A74.8AF4	C9115AXI-B	Yes	CAPWAP	2	✓	10.10.99.111	f80f.6f15.24a0	Flex	Registered	default-policy-tag	default-site-tag	default-rf-tag	Loc

1 - 3 of 3 access points

Step 2: You can select an individual AP or multiple APs to convert to CAPWAP.

Number of AP(s): 2

Convert to EWC Convert to CAPWAP

AP Name	AP Model	EWC Capable	Image Type	Slots	Admin Status	IP Address	Base Radio MAC	AP Mode	Operation Status	Policy Tag	Site Tag	RF Tag	Tag Source	Location
AP2CF8.9B5F.D0EC	C9120AXI-B	Yes	EWC	2	✓	10.10.50.75	10b3.c6ba.fce0	Flex	Registered	default-policy-tag	default-site-tag	default-rf-tag	Default	default location
AP7069.5A74.8FD4	C9115AXI-B	Yes (Internal)	EWC	2	✓	10.10.50.73	f80f.6f15.4ba0	Flex	Registered	default-policy-tag	default-site-tag	default-rf-tag	Default	default location

Converting EWCs to CAPWAP using option 43

DHCP option 43 is a vendor-specific option and is used for providing WLC IP addresses to the access point. Using option 43 with a specific subtype option, you can have the EWC convert to CAPWAP and join a WLC appliance or virtual controller. After the AP receives DHCP option 43 and subtype 0xF2 at bootup, the AP type will be converted to CAPWAP, and the AP will follow the regular joining process.

The DHCP configuration on the switch is shown below.

```
Switch(dhcp-config)#option 43 hex F2056464645801
```

EWC to CAPWAP AP conversion using the AP CLI

You can convert an EWC to function as CAPWAP by executing a single command from the access point CLI:

```
AP#ap-type capwap
```

Note: The access point will reboot and the AP type will change to NOT EWC CAPABLE. Also, after the AP is converted to CAPWAP, it will no longer participate in the active election process.

Migrating an EWC network to a controller-based network

If you need to have more than 100 APs on the network, you can easily migrate your existing EWC network to a controller-based network, which can be Cisco Catalyst 9800 Series (appliance or virtual) or AireOS (3504, 5520, or 8540 wireless controller or virtual controller running 8.10.X software)

Step 1: From the EWC web UI, navigate to **Configuration > Wireless > Access Points**, then scroll down to the **Migrate Network** option.

Step 2: Configure the name and IP address of the controller to which you want to migrate the APs, then click **Apply**. After the migration, the APs will not run the controller function and will join the configured controller.

▼ Migrate Network

● To migrate all the Embedded Wireless Controller APs to a controller based deployment, configure the controller IP address and name below. After the migration, Access Points will no longer run the controller function and will look for the controller (appliance or virtual) to join.

New Controller Name*	C9800-CL-1
New Controller IP Address	172.21.228.55

Apply

Site Survey Option

Cisco EWC on Catalyst APs is next-generation autonomous and supports Site Survey in Cisco IOS XE Release 16.12.2s. The following access points with the EWC image support the Site Survey capability:

Cisco Catalyst 9120AX Series (C9120AX-x)

Cisco Catalyst 9117AX Series (C9117AX-x)

Cisco Catalyst 9115AX Series (C9115AX-x)

Cisco Catalyst 9130AX Series (C91130AX-x)

Cisco EWC supports an internal DHCP server and operates without a pingable gateway. This enables the user to take the access point powered by a battery pack and a client device to perform an active survey. User need to have a power adapter connected to external power supply.

To run the EWC as site survey AP user need to start with day-0 configuration as described in the section day-0 provisioning of this document.

Once the provisioning is complete and the configured SSID comes up, join it using your defined PSK, and open your web browser to <https://192.168.1.1> or <https://mywifi.cisco.com>.

To set the transmit power and channel of the radio, navigate to **Configuration > Access Points > 5 GHz radio or 2.4 GHz radio** > select the AP. From here you can change the channel and transmit power of your APs radio by changing the Assignment Method from Global to Custom, setting the required values, then clicking '**Update and Apply to Device**'.

Edit Radios 5 GHz Band

Configure Detail

General

AP Name: AP7069.5A74.7C2C

Admin Status: **ENABLED**

Antenna Parameters

Antenna Type: Internal

Antenna Mode: Omni

Antenna A: ☒

Antenna B: ☒

Antenna C: ☒

Antenna D: ☒

Antenna Gain: 10

Download [Core Dump](#) to bootflash

RF Channel Assignment

Current Channel: 36

Channel Width: 40 MHz

Assignment Method: Custom

Channel Number: 36

Tx Power Level Assignment

Current Tx Power Level: 8

Assignment Method: Custom

Transmit Power: 8

BSS Color

BSS Color Configuration: Global

BSS Color Status: **ENABLED**

Current BSS Color: 29

Update & Apply to Device

Reference documents

- Quick Start Guide:
<https://www.cisco.com/c/dam/en/us/solutions/collateral/enterprise-networks/mobility-express/guide-c07-741338.pdf>
- Deploying EWC-AP demo:
<https://xd.adobe.com/view/76b25e06-d905-487c-4de1-3d19719a5ac5-0083/>
- CAPWAP AP Conversion to EWC-AP demo:
<https://xd.adobe.com/view/8fd6c90c-2543-4ded-772c-12be163103f7-f9e7/>
- Guest access with Cisco Spaces demo:
<https://xd.adobe.com/view/e7af8c14-b2ea-426c-5bf4-0ca6efa022f5-919e/>
- Release Notes:
<https://www.cisco.com/c/en/us/td/docs/wireless/controller/ewc/16-12/rel-notes/ewc-rn-16-12-2.html>
- Config Guide:
https://www.cisco.com/c/en/us/td/docs/wireless/controller/ewc/16-12/config-guide/ewc_cg_16_12.html
- Command Reference:
https://www.cisco.com/c/en/us/td/docs/wireless/controller/ewc/16-12/cmd-ref/ewc_cr_16_12.html
- Online Help:
<https://www.cisco.com/c/dam/en/us/td/docs/wireless/controller/ewc/16-12/olh/Default.htm>
- Mobile App:
https://www.cisco.com/c/en/us/td/docs/wireless/controller/ewc/mob-app/user-guide/cisco_catalyst_wifi_app_user_guide.html

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at <https://www.cisco.com/go/offices>.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/go/trademarks>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)