Understand Catalyst 9800 Wireless Controllers Configuration Model

Contents

Introduction

This document describes the new configuration model of tags and profiles that is available on Catalyst 9800 Series Wireless Controllers.

Background information

This document provides a walk through the various GUI options - wizard and menu-based that are available to design and deploy your 9800 WLC to service SSIDs at multiple sites.

If you are familiar with AireOS Wireless LAN Controllers (WLCs), you are aware of Access Points (APs) and FlexConnect Groups.

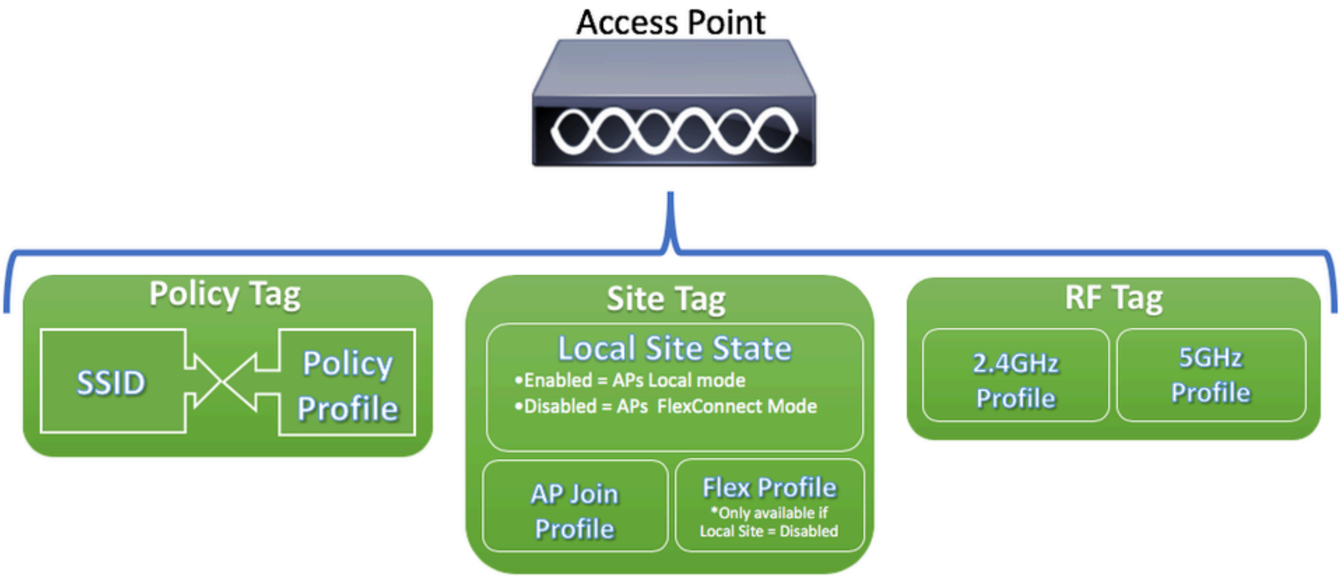
Those groups allow you to control what capabilities (Ex: which Wireless Local Area Networks [WLANs] or Radio Frequency [RF] profiles) are available for each AP, based on their AP group association.

On 9800 WLCs, tags are used to control the features that are available for each AP. Tags are assigned to every AP and inside every tag, you can find all the settings that were applied to the AP.

There are three tags:

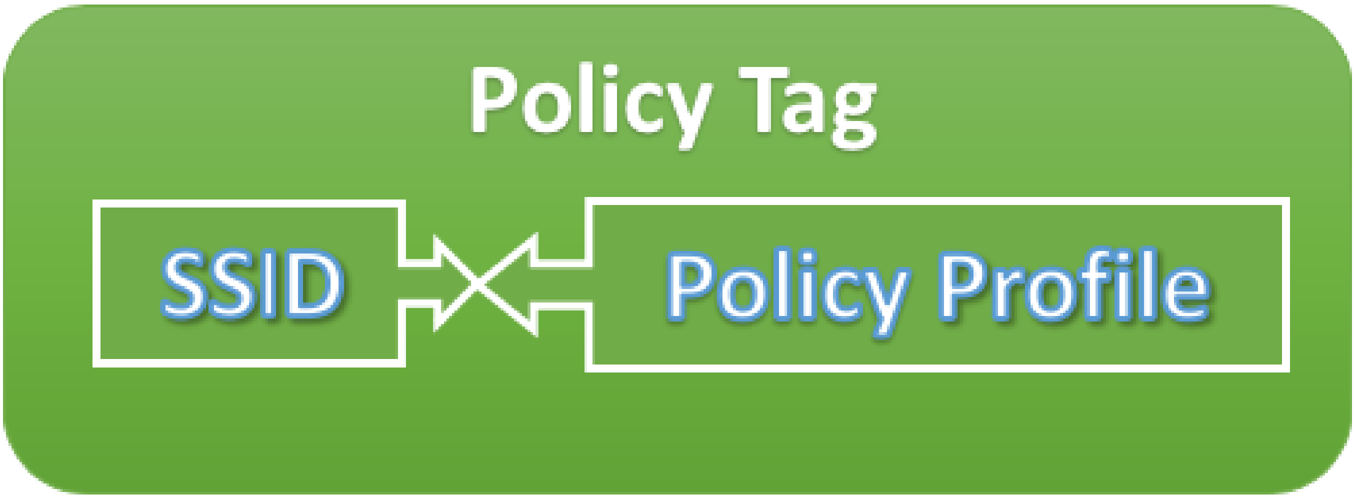
- Policy Tag
- Site Tag
- RF Tag

Visual scheme of an AP configuration:



Policy Tag

Policy Tag is the link between a WLAN Profile [Service Set Identifier (SSID)] and a Policy Profile.



- Policy Profile

Inside a Policy Profile, you can specify Virtual Local Area Network (VLAN) ID, If traffic is central or local switching, Mobiliy Anchors, Quality of Service (QoS), timers, among other settings.

- SSID

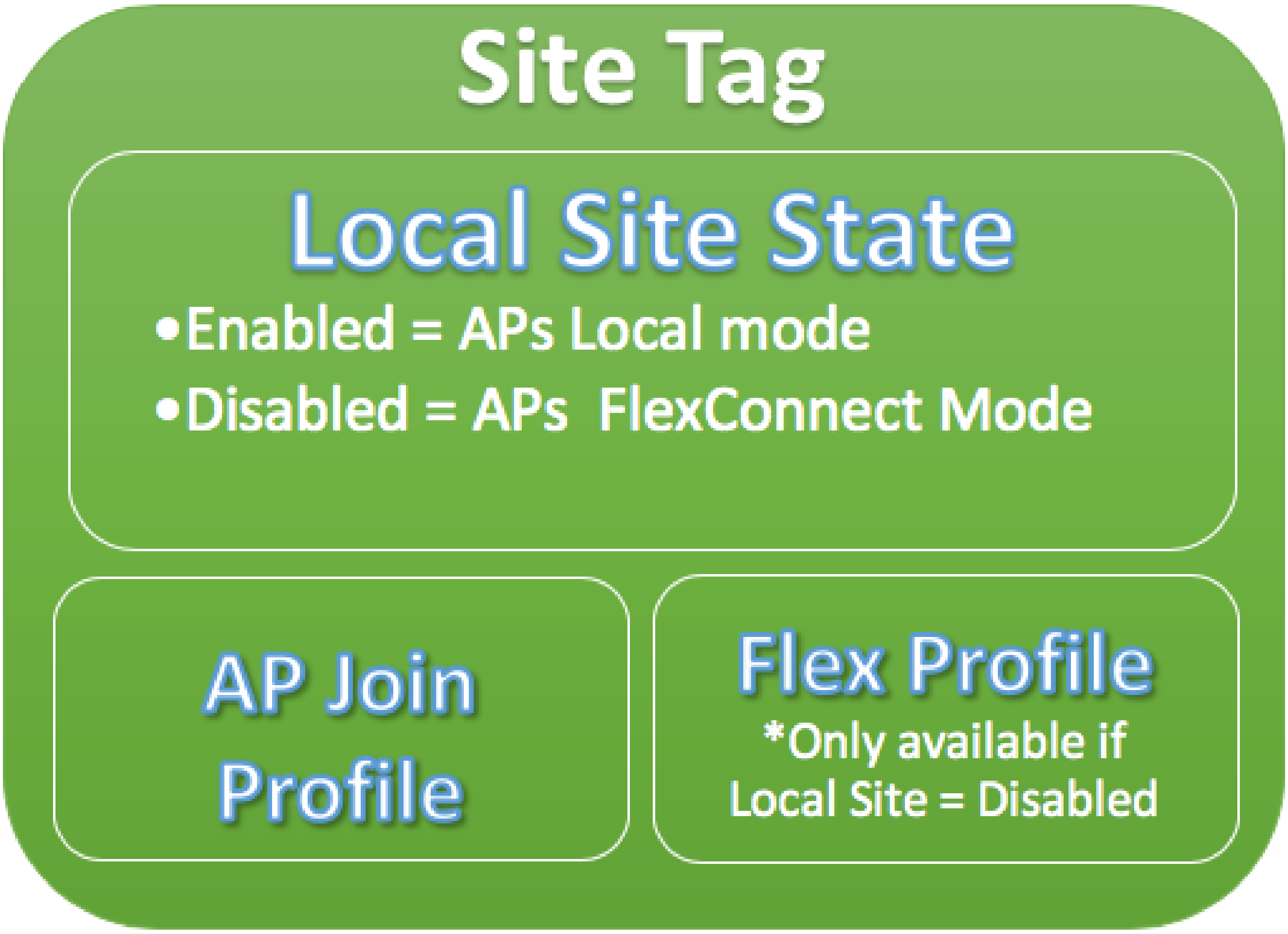
Inside a SSID, you can specify the WLAN name, Security type for the WLAN, advanced protocols like 802.11k among other settings.

Site Tag

Site Tag defines if the APs are in Local Mode or Flexconnect mode. Other AP modes like Sniffer, Sensor, Monitor, Bridge can be configured directly on the AP.

The Site Tag also contains the AP Join Profile and Flex Profile that are applied to the AP.

Note: Flex Profile Setting only becomes available if the Local Site setting is disabled.



Site Tag

Local Site State

- Enabled = APs Local mode
- Disabled = APs FlexConnect Mode

AP Join Profile

Flex Profile

*Only available if Local Site = Disabled

- AP Join Profile

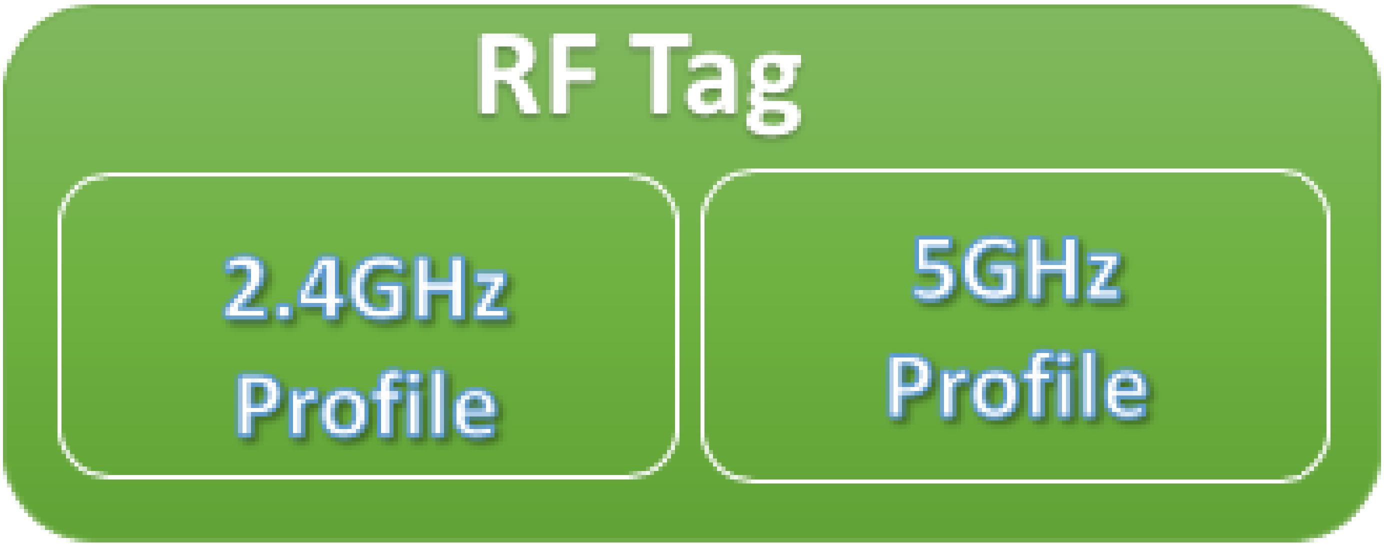
Inside an AP Join Profile, you can specify settings such as Control and Provisioning of Wireless Access Points (CAPWAP) timers, remote access to APs (Telnet/Secure Shell [SSH]), backup controller configuration and others.

- Flex Profile

On a Flex Profile, you have settings such as Address Resolution Protocol (ARP) caching, VLAN/ACL mapping and so on.

RF Tag

Inside an RF tag, you can either select any RF profile or select to use the Global RF configuration.



- 2.4 GHz Profile

Allows you to define specific data rates to be used, Transmit Power Control (TPC) settings, Dynamic Channel Assignment (DCA) and some other Radio Resource Management (RRM) settings for the 2.4GHz band.

- 5GHz Profile

Allows you to define specific data rates to be used, Transmit Power Control (TPC) settings, Dynamic Channel Assignment (DCA) and some other Radio Resource Management (RRM) settings for the 5GHz band.

By default, the APs get assigned the default Tags (Default Policy Tag, Default Site Tag, Default RF Tag) and the default Tags gets assigned the default profiles (Default Policy Profile, Default AP Join Profile, Default Flex Profile).

Note: You can modify all the default settings except for the Default Policy Tag. The Default Policy Tag automatically links any SSID with a WLAN ID from 1 to 16 to the default policy profile and those links cannot be modified.

List of Settings per Profile

If you are familiar with AireOS, you are used to configure all characteristics for an SSID under WLAN configuration. On 9800 WLCs, these settings are split between WLAN Profile and Policy Profile. Also, some of the configuration seen under the Global AP Configuration Page on AireOS GUI has been moved to the AP Join Profile. Here you can find the list of all the settings that you can configure under each profile.

WLAN Profile

- 802.11k
- Band select
- Broadcast SSID
- 802.11v (BSS, DMS, TFS, WNM)
- CCX
- Off Channel Scan Deferral

- Coverage Hole Detection (CHD)
- Client Association Limit
- Diagnostic Channel Capability
- Delivery Traffic Indication Message (DTIM)
- Access Control List (ACLs)
- Load Balance
- Local Authentication Settings
- Security Settings (PSK, 802.1x, WebAuth)
- Media-stream settings
- Management Frame Protection (MFP)
- 802.11ac settings per WLAN
- Peer-to-peer blocking
- Radio Policy
- Roamed Voice Clients re-anchor
- Static IP Clients Support
- Unscheduled automatic power save delivery (U-APSD) for WLAN
- Work Group Bridge (WGB) Support
- Universal AP
- Wifi Direct
- Wi-Fi Multimedia (WMM)
- Authentication List (Remote Authentication Dial-In User Service [RADIUS] servers)

Policy Profile

- Authentication, Authorization, and Accounting (AAA) override
- AAA Policy
- Accounting List
- Auto QoS
- Call Snooping
- Central/Local Switching
- CiscoTrustSec (CTS) Security group access control lists (SGACLs)
- Datalink ACL
- Description
- Type-Length-Value (TLV) Caching (Dynamic Host Configuration Protocol [DHCP], Hypertext Transfer Protocol [HTTP])
- Idle Timeout
- Idle Threshold
- Fabric Profile
- Flex Network Address Translation / Port Address Translation (NAT/PAT)
- Flex Split MAC ACL
- Flex VLAN Based Central Switching
- IP Network-based Application Recognition (NBAR) Protocol Discovery
- IPv4/v6 ACL
- IPv4 DHCP
- IPv4/IPv6 Flexible Netflow Monitor
- Mobility Anchor
- Multicast VLAN
- Network Access Control (NAC)
- Passive Client
- RADIUS Profiling
- Reanchor
- Service Policy
- Session Timeout

- Session Initiation Protocol (SIP) Call Admission Control (CAC)
- Static IP Mobility
- Subscriber Policy Name
- Umbrella Parameter Map
- Uniform Resource Locator (URL) filter
- VLAN
- WGB VLAN
- WGB Broadcast Tagging

AP Join Profile

- CAPWAP Backup
- CAPWAP Fallback
- CAPWAP Retransmit
- CAPWAP Timers
- CAPWAP Window
- Cisco Discovery Protocol (CDP) for APs
- Core Dump Trivial File Transfer Protocol (TFTP)
- Country Code
- Description
- 2.4GHz / 5GHz Client Reporting interval
- 802.1x Credentials for APs which act as supplicants
- Extended Module support
- Hyperlocation
- Internet Content Adaptation Protocol (ICAP)
- Jumbo Maximum Transmission Unit (MTU) status
- Link Aggregation (LAG) for APs
- Lawful Interception
- Light-Emitting Diode (LED) status
- Link Encryption
- Link Latency
- Mesh Profile
- AP Management user
- Network Time Protocol (NTP)
- Packet Capture Profile
- Power over Ethernet (PoE)
- AP Preferred Mode (IPv4/IPv6)
- Rogue Detection Settings (Containment, min Received Signal Strength Indicator [RSSI], min transient time, report interval)
- SSH/Telnet
- Persisten SSID
- Statistics Timer
- Syslog
- Transmission Control Protocol - Maximum Segment Size (TCP MSS) Adjust
- TFTP Downgrade
- AP Trace Profile
- Universal Serial Bus (USB) enable

Flex Profile

- ACL Policy
- ARP Caching
- CTS

- Description
- Fallback Radio Interface Shutdown
- HTTP Client Proxy
- Min Latency Join for Flex AP
- Local Authentication parameters
- Multicast Parameters for Flex APs
- Native VLAN ID
- OfficeExtended AP mode
- Predownload
- Resilient (For Flex+Bridge APs)
- VLAN name mapping

RF Profile

- Airtime Fairness
- Band Select settings (Only on 2.4GHz profile)
- Channel
- Client Network Preference
- Coverage Hole Detection (CHD) settings
- Description
- 802.11n only mode
- High Density automatic settings
- High-Speed Roam (HSR)
- Load Balance Settings
- Rates
- Traps
- TX Power Levels

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

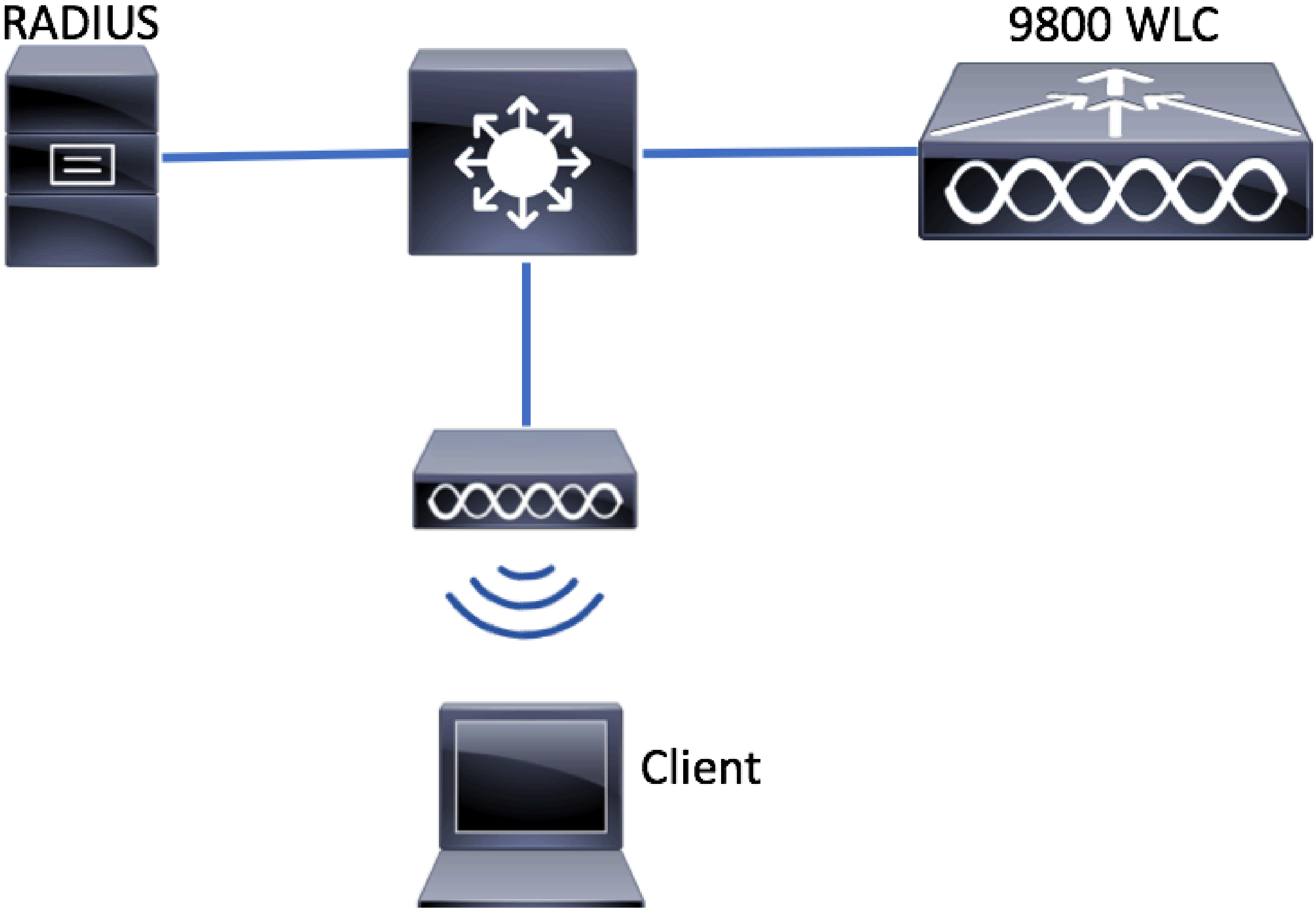
The information in this document is based on these software and hardware versions:

- Cisco Catalyst 9800 Wireless Controllers running Cisco IOS® XE, Gilbraltar v16.10

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Network Diagram

This document is based on this topology:

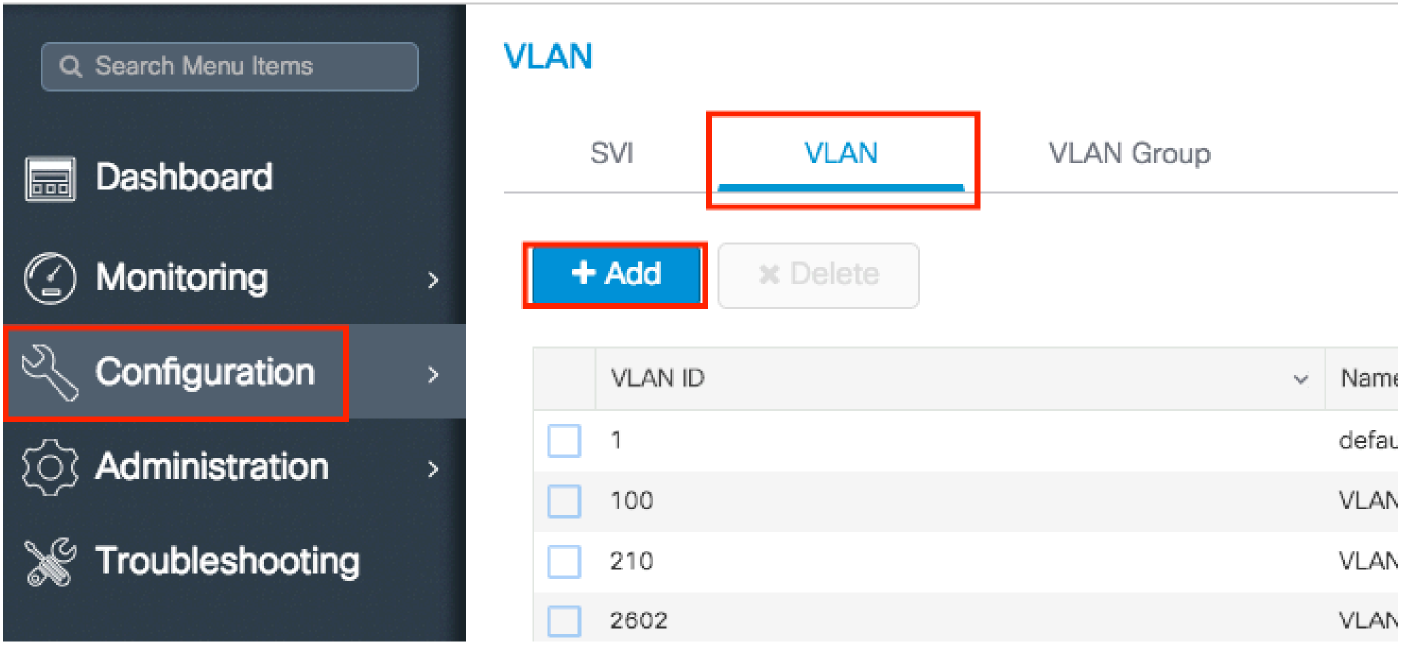


Configurations

Declare Client VLANs

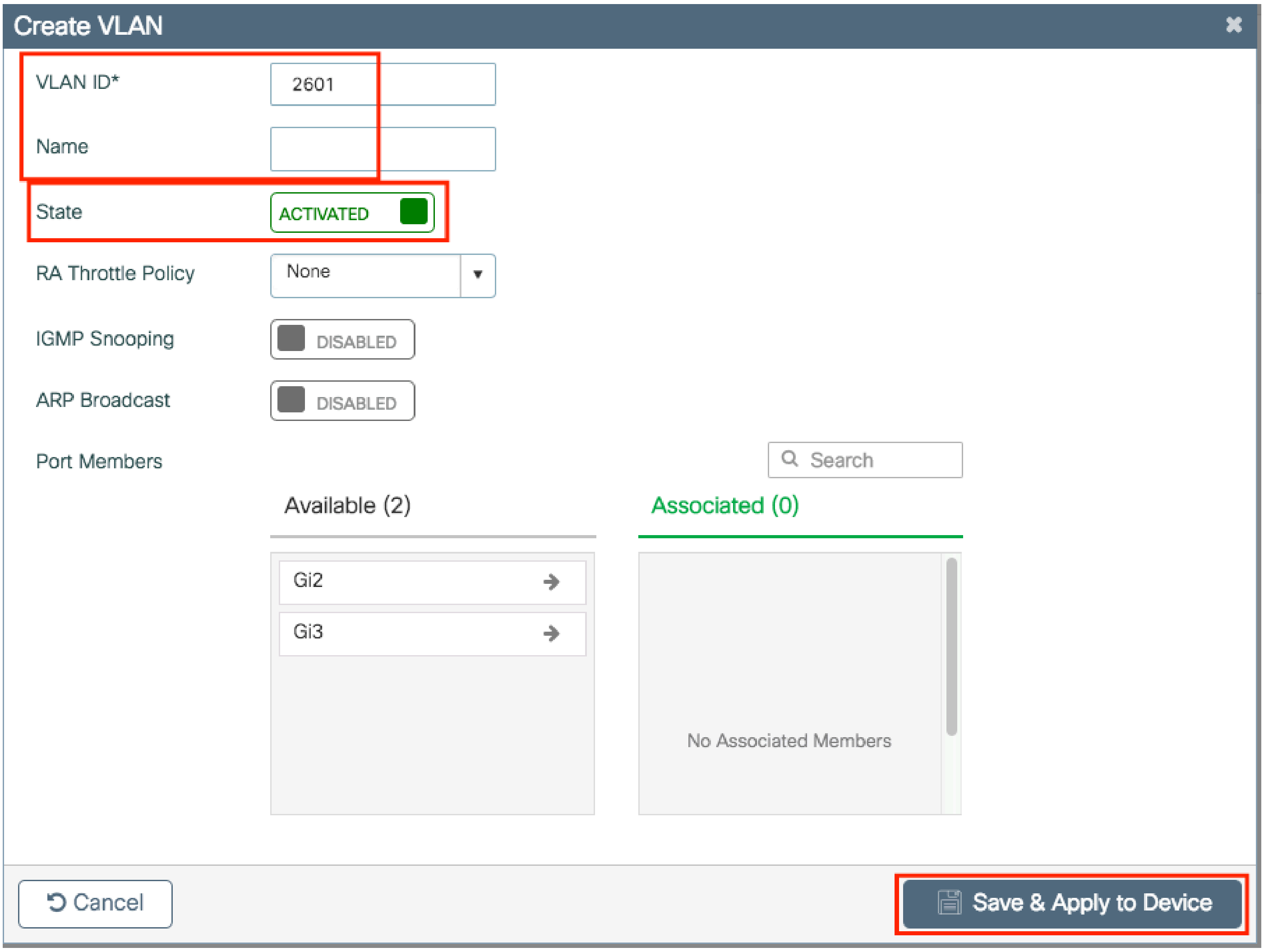
Before you start any configuration, you need to add the needed VLANs (VLANs where the wireless clients are assigned).

Step 1. Navigate to **Configuration** > **Layer2** > **VLAN** > **VLAN** > **+ Add**.



	VLAN ID	Name
□	1	defau
□	100	VLAN
□	210	VLAN
□	2602	VLAN

Step 2. Enter the needed information.



VLAN ID* 2601

Name

State ACTIVATED

RA Throttle Policy None

IGMP Snooping DISABLED

ARP Broadcast DISABLED

Port Members

Note: If you do not specify a Name, the VLAN automatically gets assigned the name of VLANXXXX, where XXXX is its VLAN id.

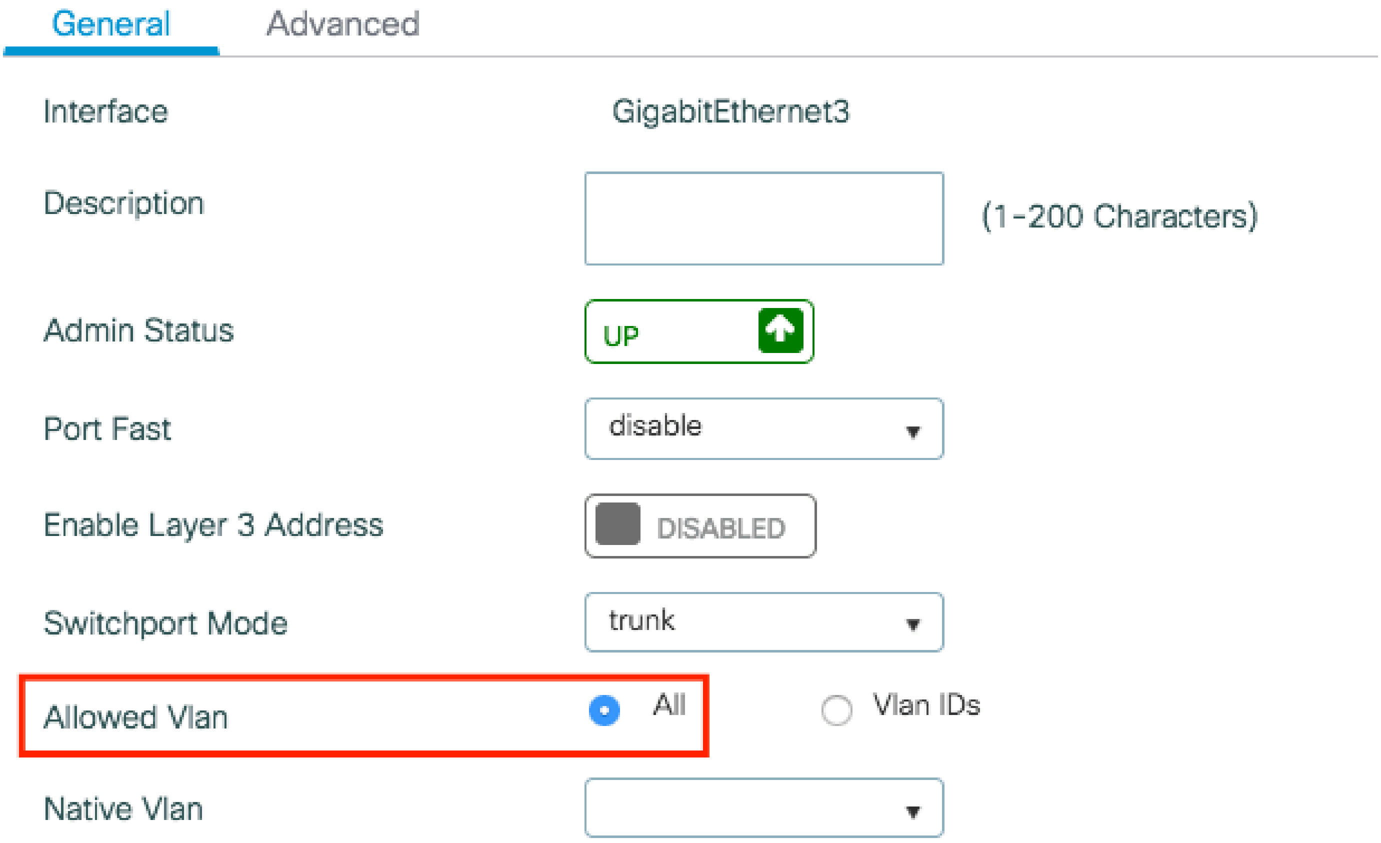
Repeat steps 1 and 2 for all the needed VLANs. Once done, you can continue to step 3.

Step 3. Verify the VLANs are allowed in your data interfaces.

If you are using port channels, navigate to **Configuration > Interface > Logical > PortChannel name > General**. If you see it configured as Allowed Vlan = All, you are done with the configuration. If you see Allowed VLAN = Vlans IDs, add the needed VLANs and after that click **Update & Apply to Device**.

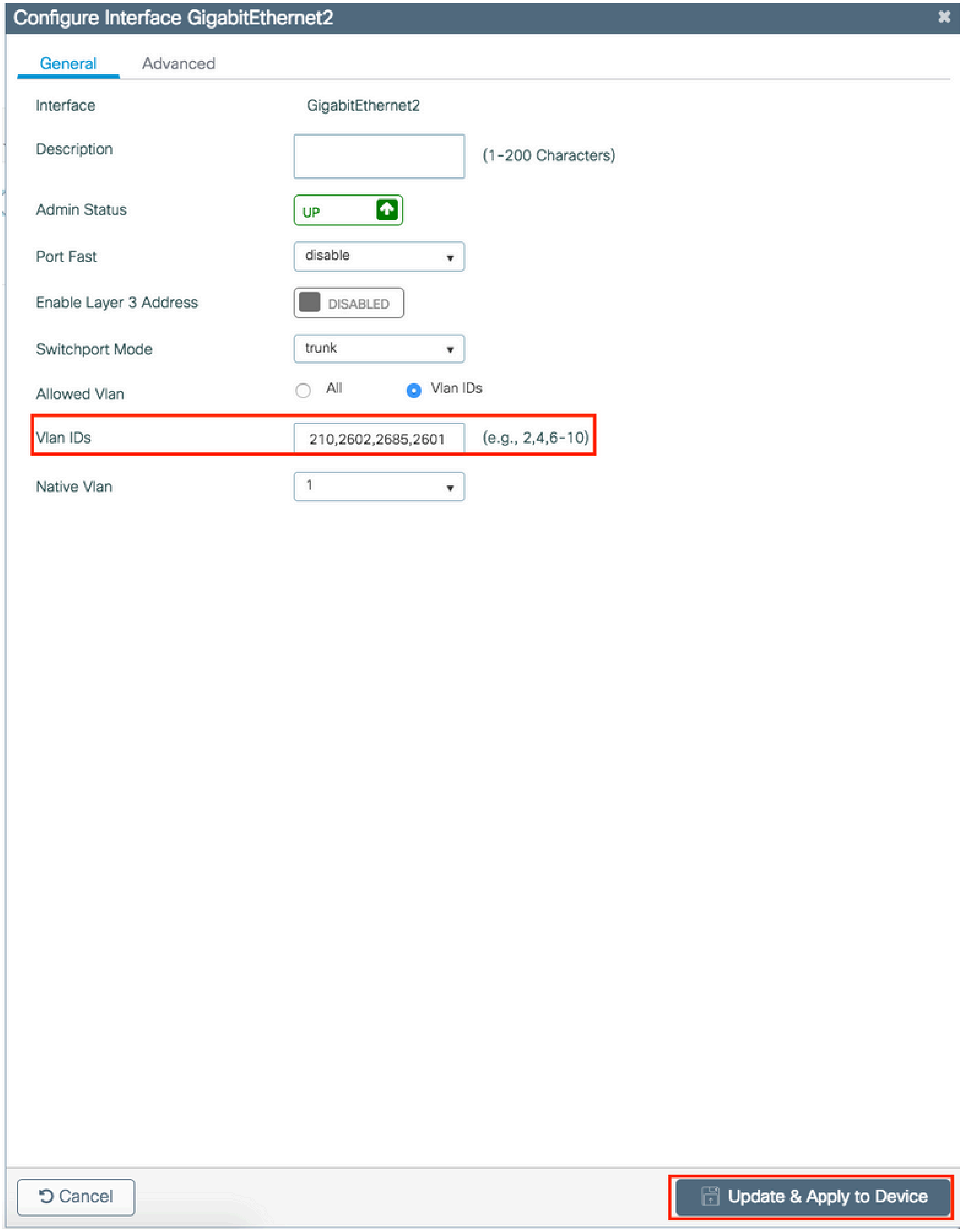
If you are not using port channels, navigate to **Configuration > Interface > Ethernet > Interface Name > General**. If you see it configured as Allowed Vlan = All, you are done with the configuration. If you see Allowed VLAN = Vlans IDs, add the needed VLANs and after that click **Update & Apply to Device**.

No changes needed:



Interface	GigabitEthernet3
Description	(1-200 Characters)
Admin Status	UP
Port Fast	disable
Enable Layer 3 Address	DISABLED
Switchport Mode	trunk
Allowed Vlan	● All ○ Vlan IDs
Native Vlan	

VLAN Id needs to be added:



Configure Interface GigabitEthernet2

Interface: GigabitEthernet2

Description: (1-200 Characters)

Admin Status: UP

Port Fast: disable

Enable Layer 3 Address: DISABLED

Switchport Mode: trunk

Allowed Vlan: ○ All ● Vlan IDs

Vlan IDs: 210,2602,2685,2601 (e.g., 2,4,6-10)

Native Vlan: 1

CLI:

```
# config t
# vlan <vlan-id>
# exit

# interface <interface-id>
# switchport trunk allowed vlan add <vlan-id>
# end
```

Wizard Based Configuration - Recommended for New 9800 WLC Deployments

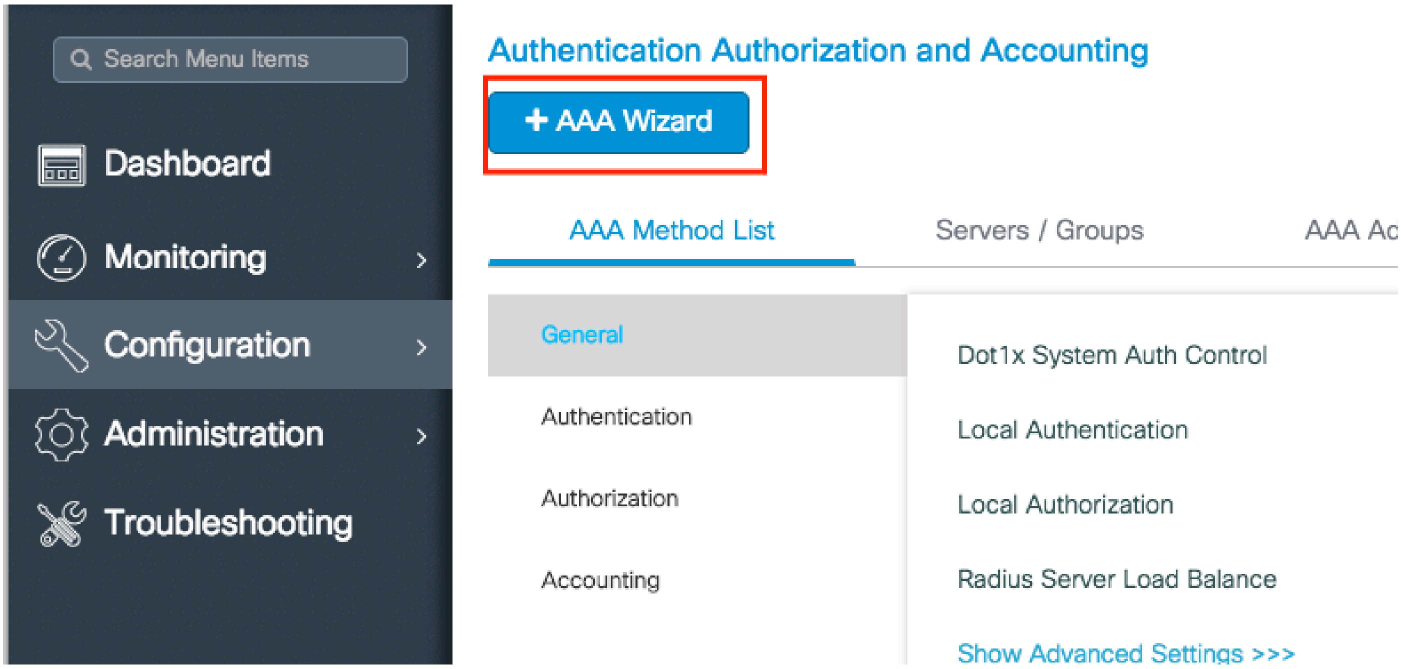
For Catalyst 9800 WLCs installation, you can use configuration wizards made available to guide you through the configuration process.

If you need to use RADIUS servers on your deployment, you can use the AAA Wizard first and then choose between the Basic or Advanced Wireless Setup.

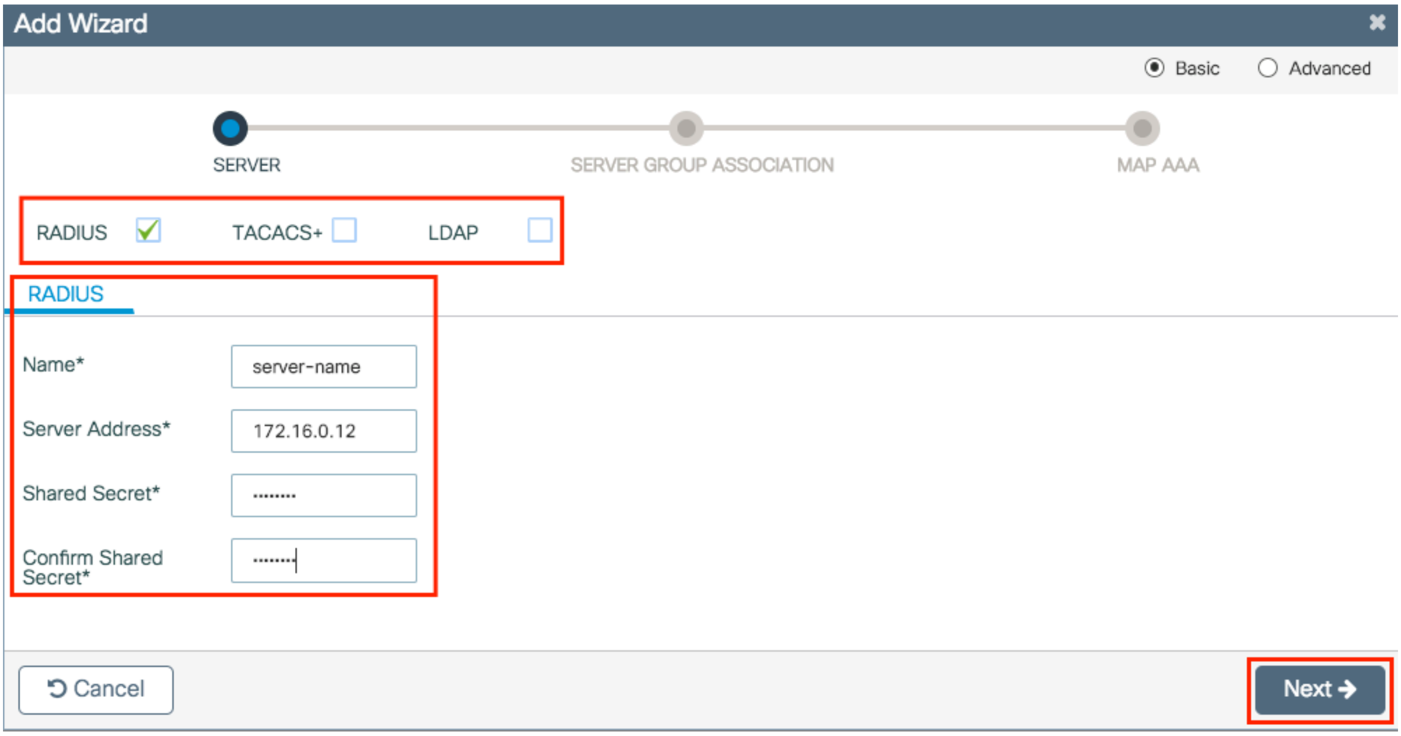
If you do not use RADIUS servers on your deployment, you can go directly to either Basic or Advanced Wireless Setup.

AAA Wizard

Step 1. Navigate to **Configuration** > **Security** > **AAA** > + **AAA Wizard**.



Step 2. Enable the needed kind of servers and enter a server name (It can be the IP address or any other string), the server IP and the shared secret. After that, click **Next**.



Add Wizard

● Basic ○ Advanced

SERVER — SERVER GROUP ASSOCIATION — MAP AAA

RADIUS ☑ TACACS+ □ LDAP □

RADIUS

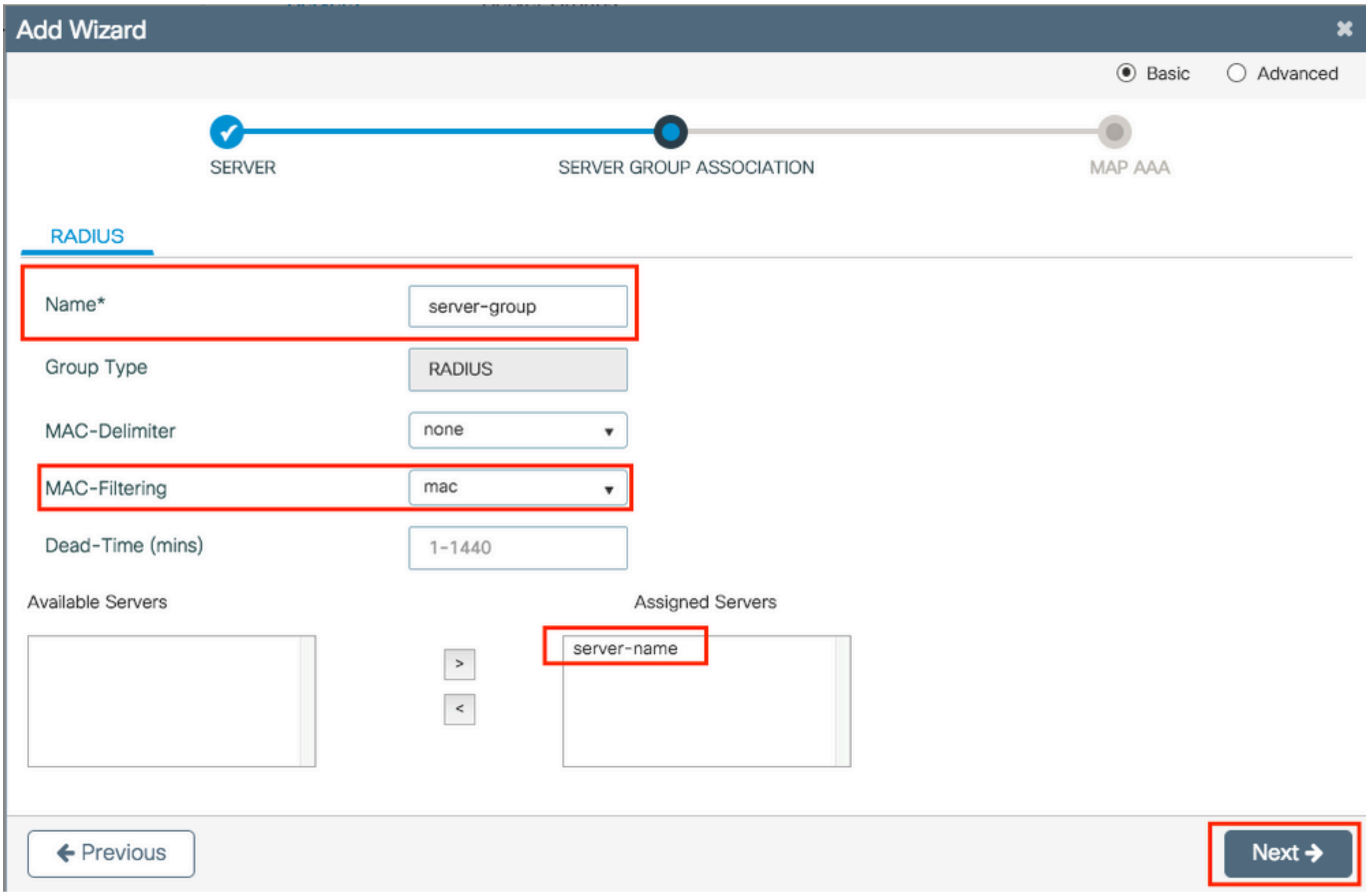
Name* server-name

Server Address* 172.16.0.12

Shared Secret* ········

Confirm Shared Secret* ········

Step 3. Enter the information to create a server group. Ensure you add the server specified in previous step to the **Assigned Servers**.



Add Wizard

● Basic ○ Advanced

SERVER — SERVER GROUP ASSOCIATION — MAP AAA

RADIUS

Name* server-group

Group Type RADIUS

MAC-Delimiter none

MAC-Filtering mac

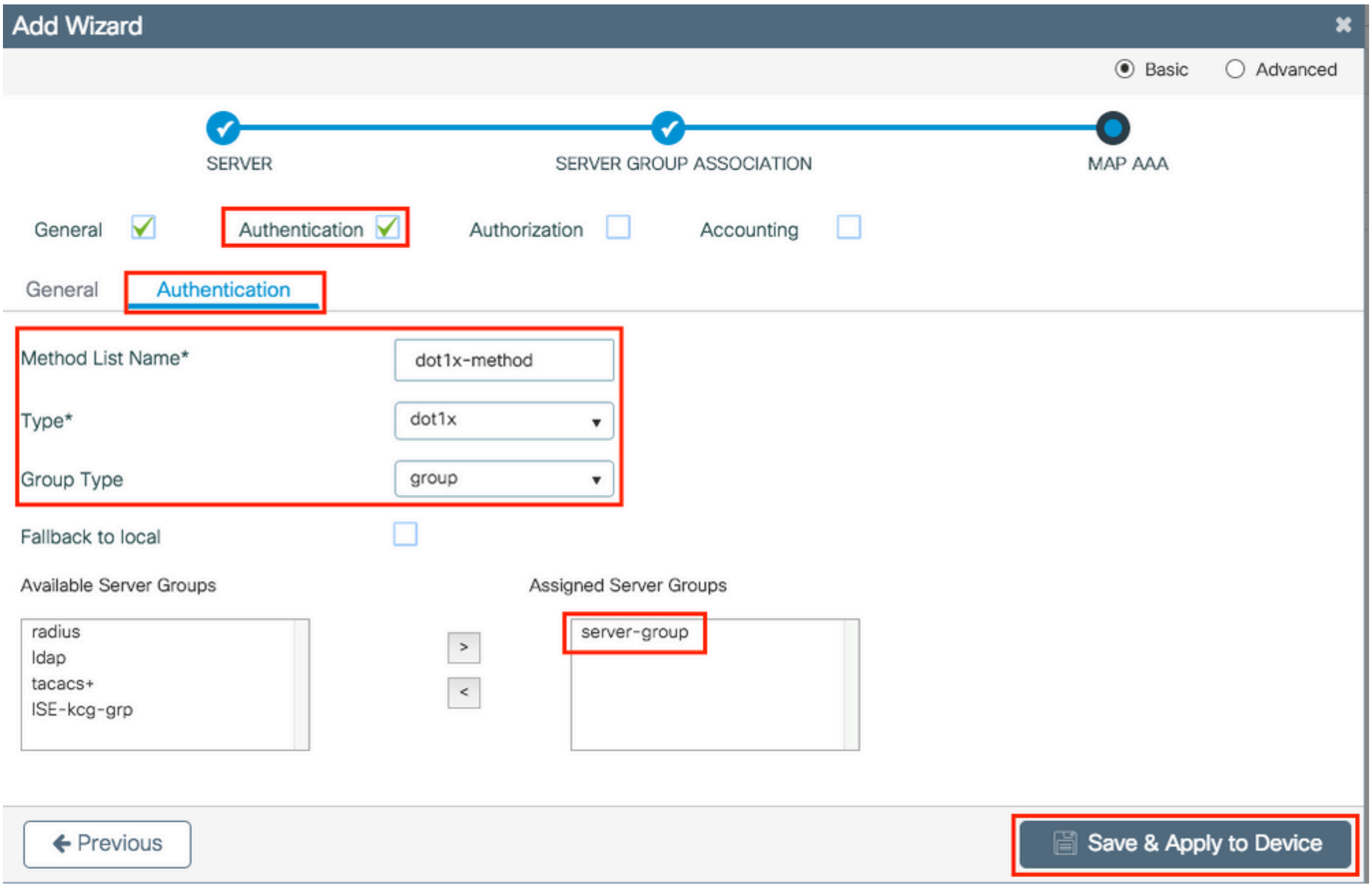
Dead-Time (mins) 1-1440

Available Servers

Assigned Servers server-name

Step 4. Enable Authentication and create an Authentication method.

Navigate to the **Authentication** tab and enter the needed information. Once done, click **Save & Apply to Device.**



Method List Name* dot1x-method

Type* dot1x

Group Type group

Fallback to local □

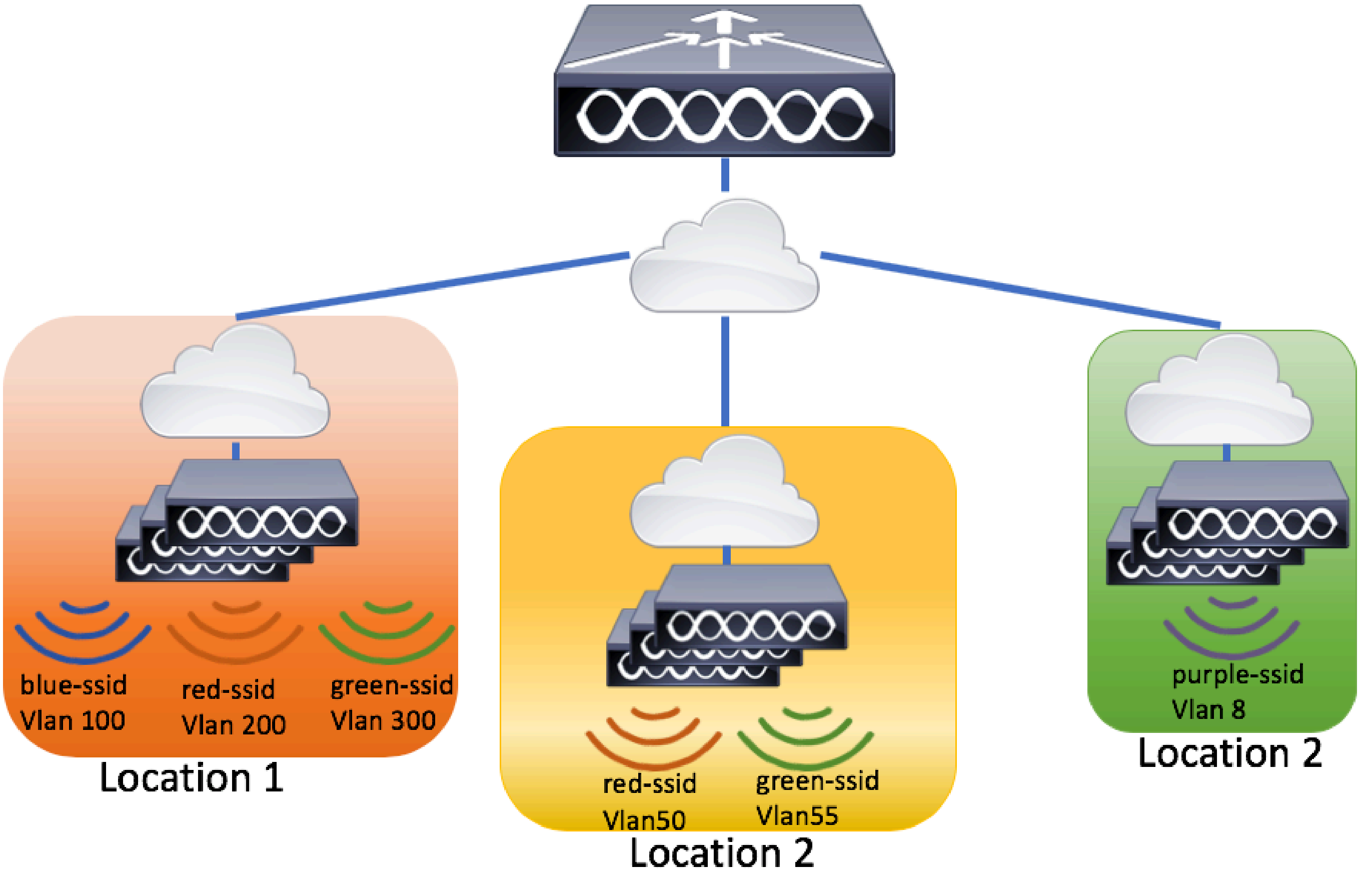
Available Server Groups: radius, ldap, tacacs+, ISE-kcg-grp

Assigned Server Groups: server-group

Basic Wireless Setup

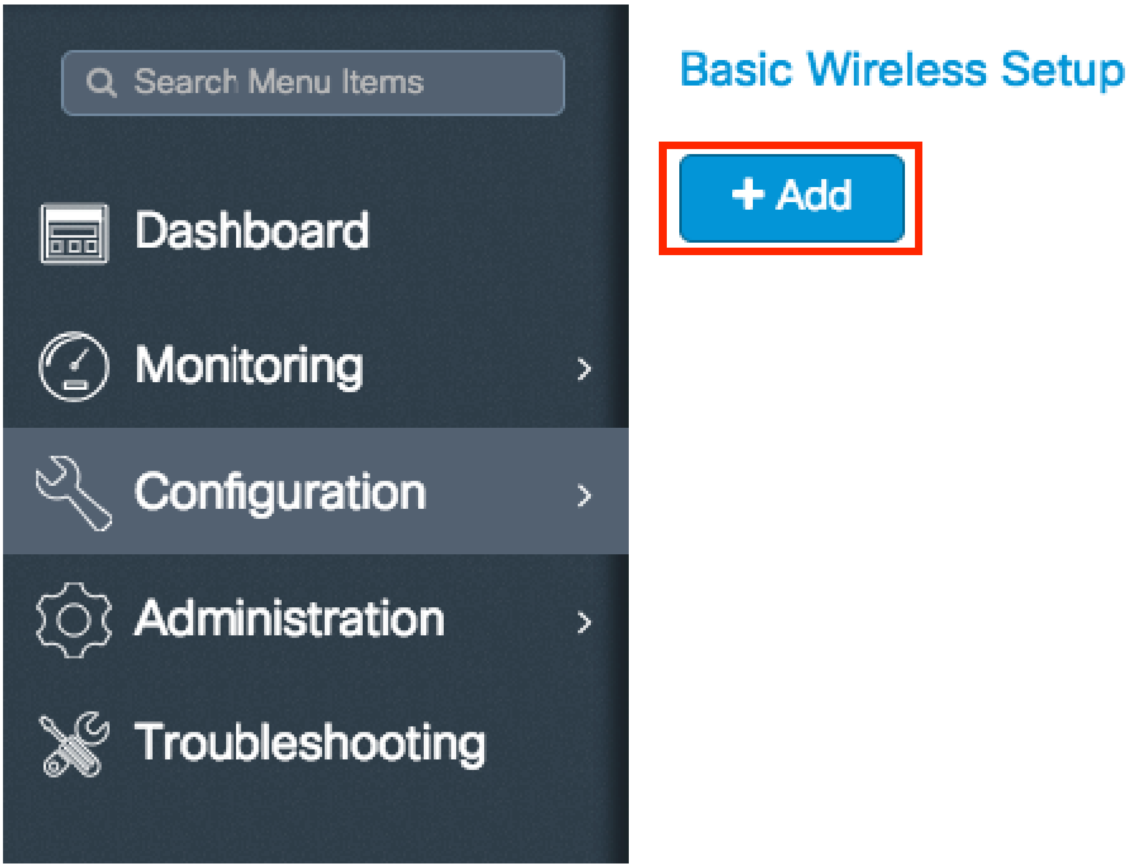
This wizard guides you through a basic wireless setup. It allows you to segment the APs funcion with little effort.

Example of a deployment with the basic wireless setup wizard.

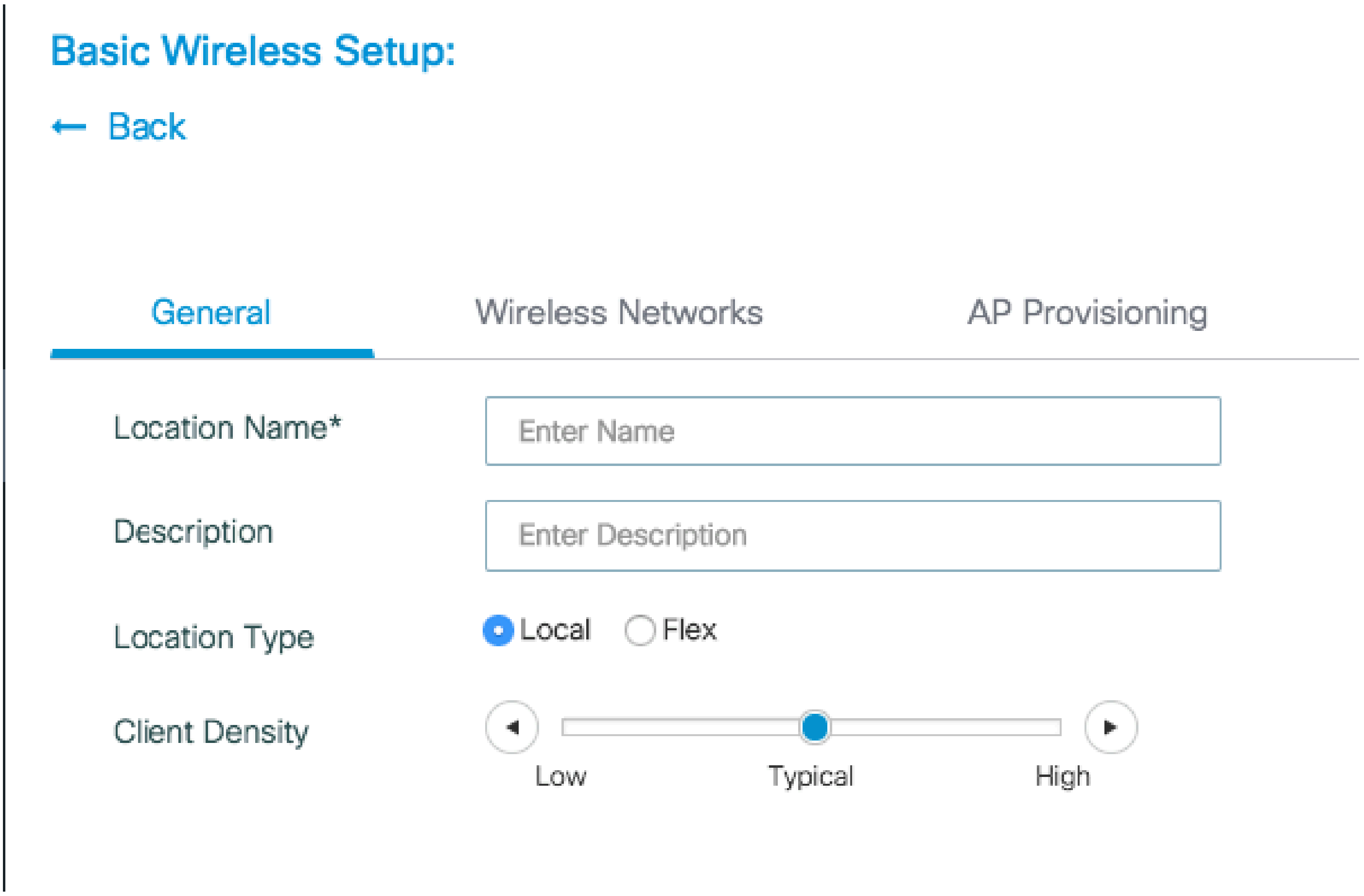


Step 1. Create a new location.

Navigate to **Configuration** > **Wireless Setup** > **Basic** > **+Add**.



Step 2. Enter the needed information on the General tab.



Basic Wireless Setup:

← Back

Location Name* Enter Name

Description Enter Description

Location Type ● Local ○ Flex

Client Density Low Typical High

Location Name = Name of the new location

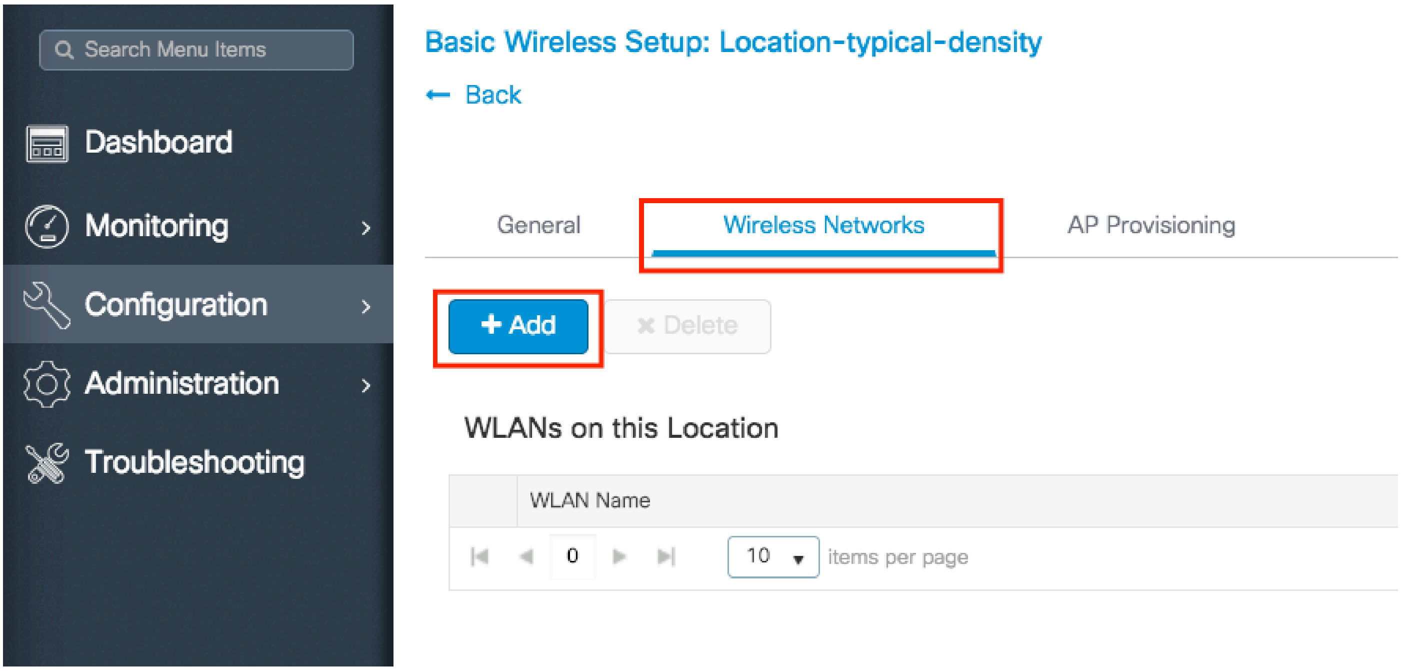
Description = Optional description of the location

Location Type = Local (Local mode APs), Flex (FlexConnect Mode APs)

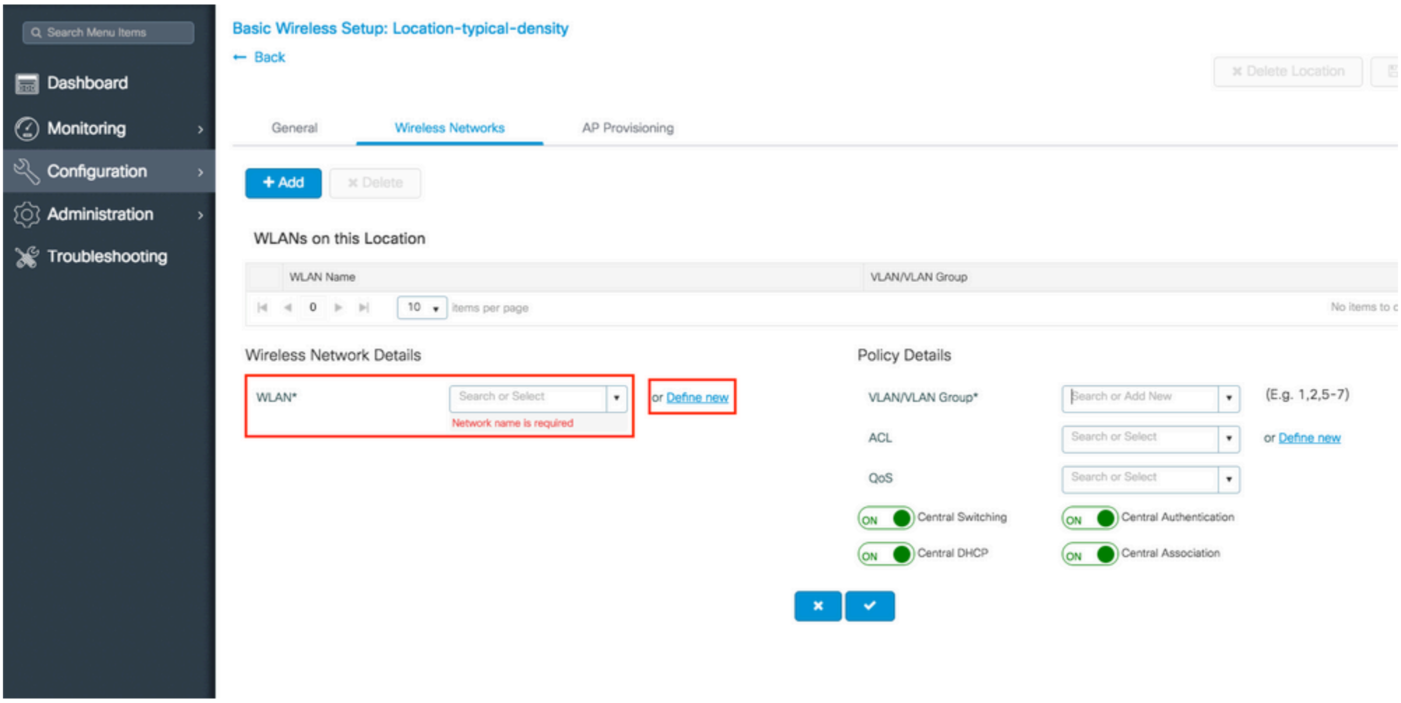
Client Density = Adjusts RF configuration for the specified Client Density.

Step 3. Add the needed WLANs.

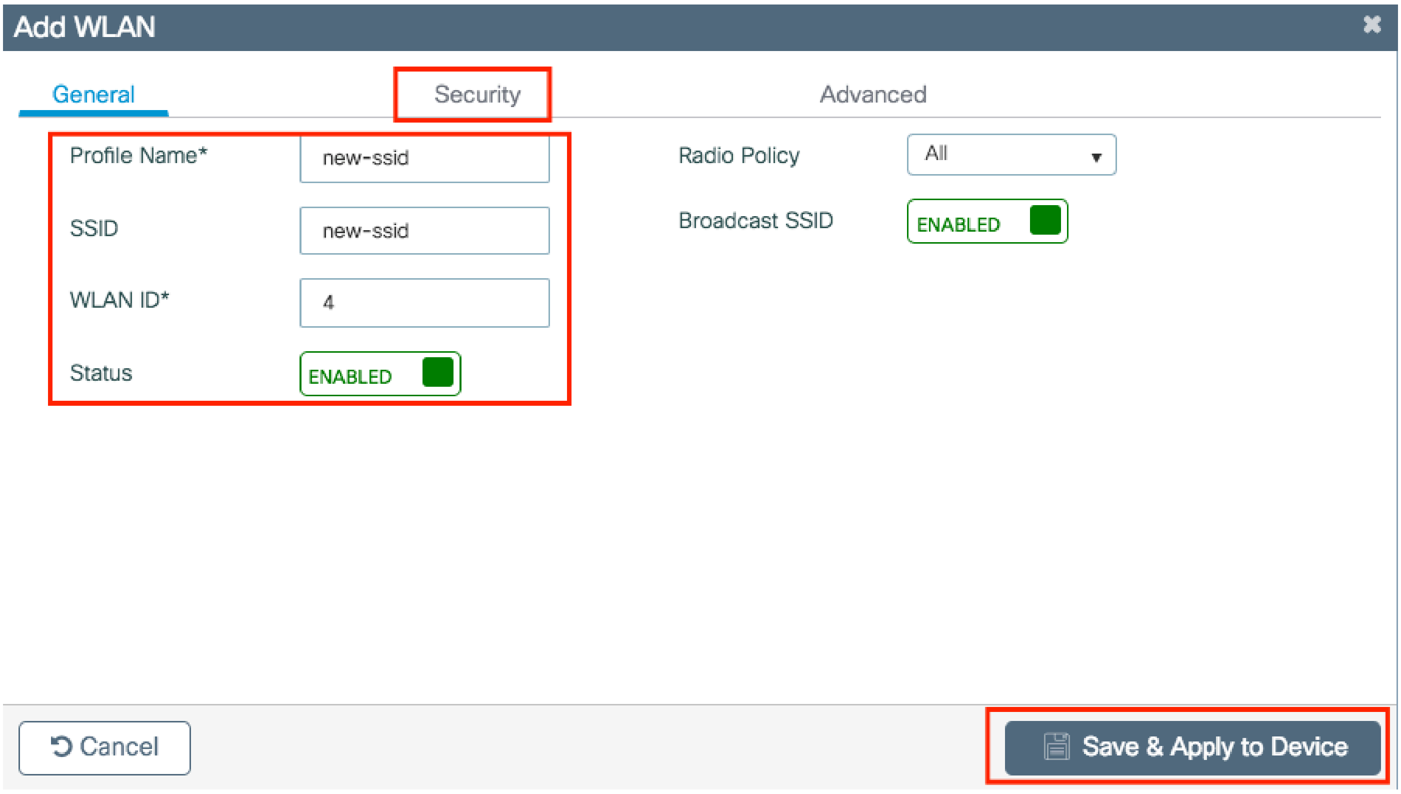
Navigate to the **Wireless Networks** tab and click **+Add**.



You can either select **Define new** to create a new WLAN from scratch or select an established one from the WLAN* drop down list.

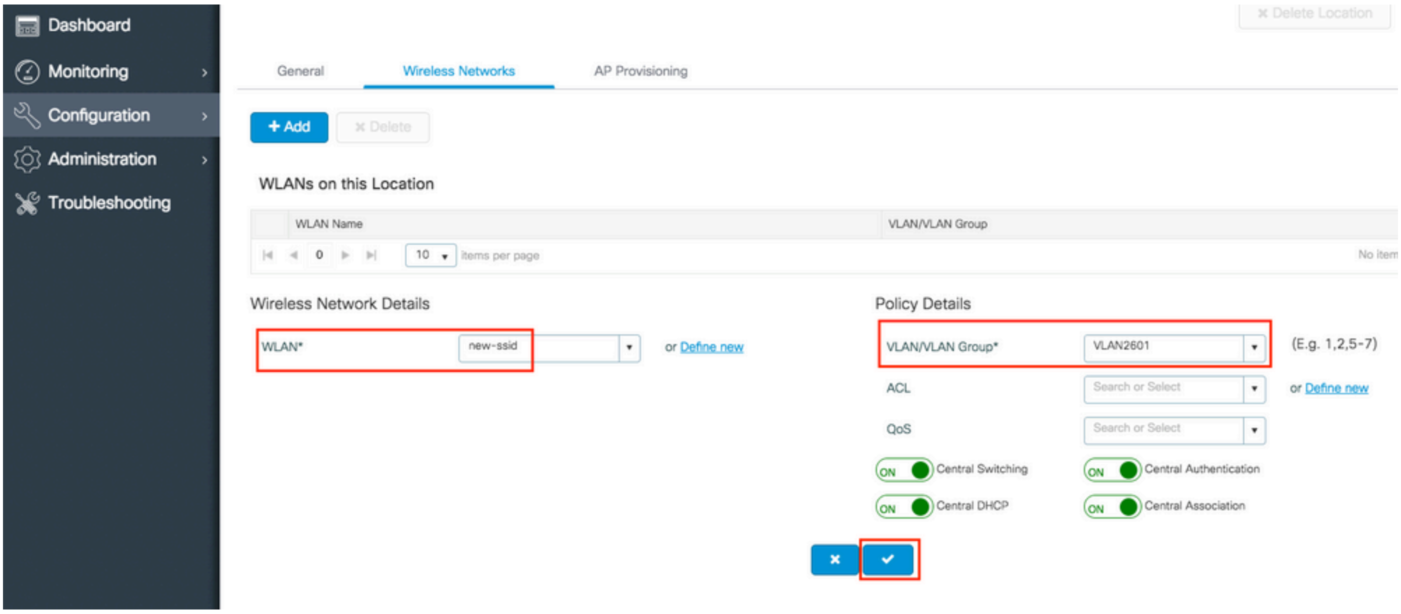


If you select **Define new**, a menu like this appears, where you can choose an SSID name, type of security and other SSID related settings. Once you complete the configuration of the new SSID, click **Save & Apply to Device.**



Profile Name*	new-ssid
SSID	new-ssid
WLAN ID*	4
Status	ENABLED
Radio Policy	All
Broadcast SSID	ENABLED

Step 4. Select the VLAN (and any other configuration) that you want to apply to that SSID. Once done, click on the checkmark.



WLANs on this Location

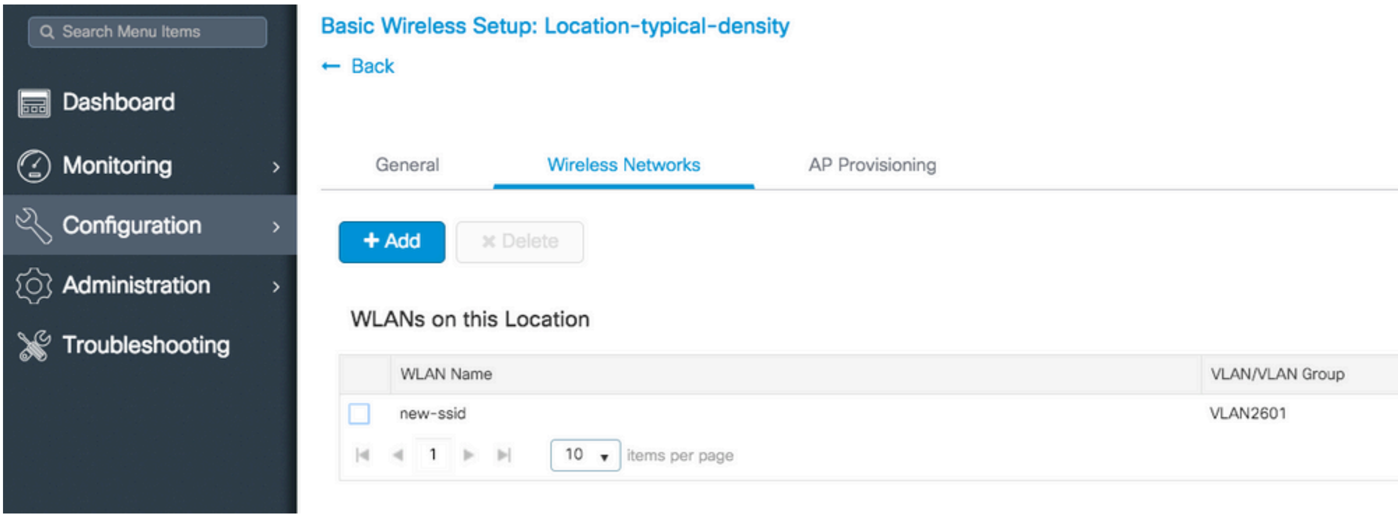
Wireless Network Details

WLAN*	new-ssid

Policy Details

VLAN/VLAN Group*	VLAN2601 (E.g. 1,2,5-7)
ACL	Search or Select
QoS	Search or Select

ON Central Switching
ON Central Authentication
ON Central DHCP
ON Central Association



WLANs on this Location

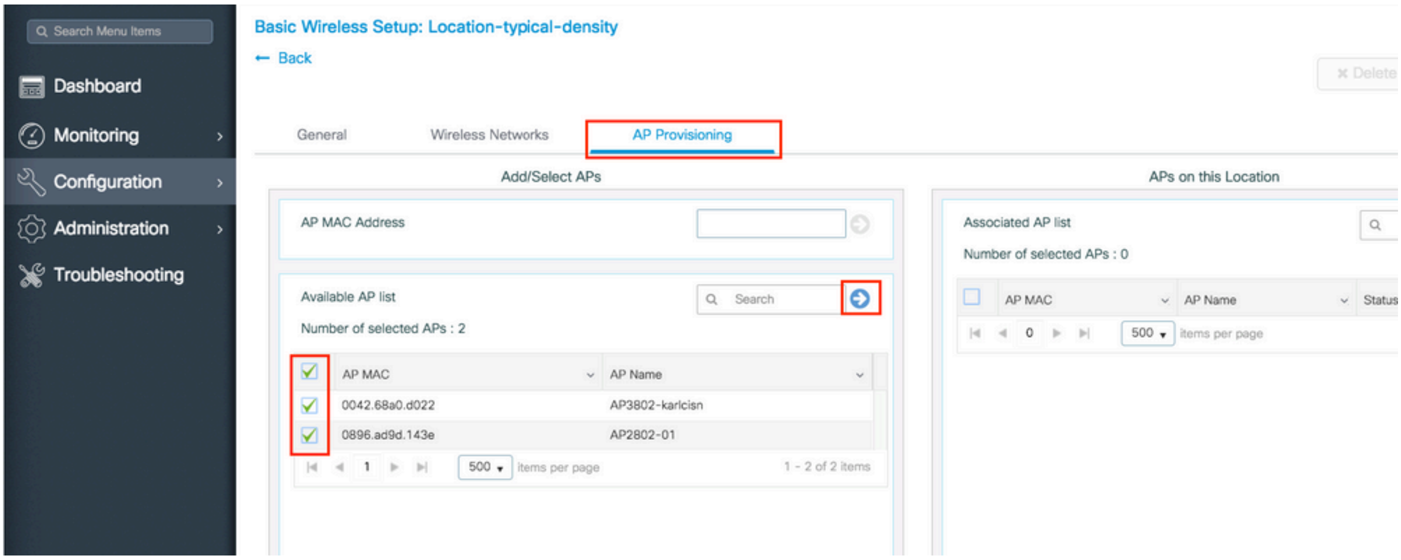
	WLAN Name	VLAN/VLAN Group
□	new-ssid	VLAN2601

1 · 10 items per page

Repeat steps 3 and 4 for all the needed WLANs.

Step 5. Assign the configuration to the needed APs.

Navigate to **AP Provisioning** tab and select the APs to which you want to apply the current configuration. Once selected, move them from **Add/Select APs** to **APs on this Location**.



Available AP list

Number of selected APs : 2

☑	AP MAC	AP Name
☑	0042.68a0.d022	AP3802-karlcisn
☑	0896.ad9d.143e	AP2802-01

1 · 500 items per page · 1 - 2 of 2 items

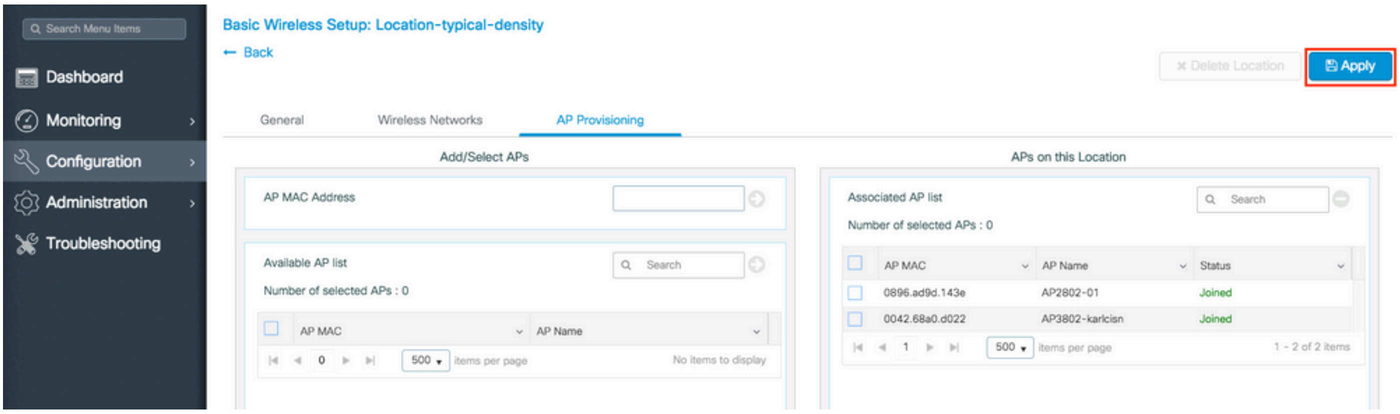
Associated AP list

Number of selected APs : 0

□	AP MAC	AP Name	Status

0 · 500 items per page

Step 6. To apply the configuration to the APs, click **Apply**.



Available AP list

Number of selected APs : 0

□	AP MAC	AP Name

0 · 500 items per page · No items to display

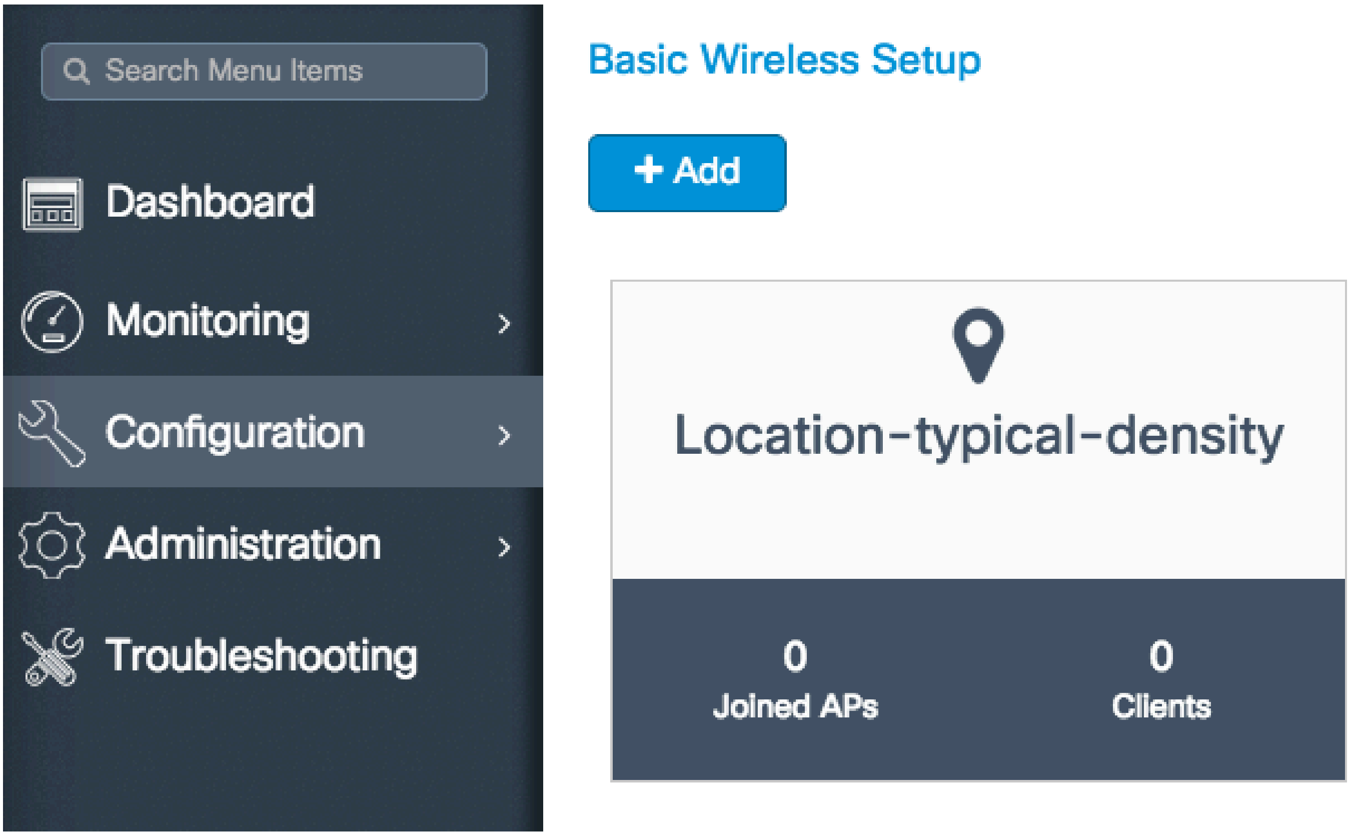
Associated AP list

Number of selected APs : 0

□	AP MAC	AP Name	Status
□	0896.ad9d.143e	AP2802-01	Joined
□	0042.68a0.d022	AP3802-karlcisn	Joined

1 · 500 items per page · 1 - 2 of 2 items

Once you click **Apply**, you can see the new Location created. At the begining, you see **0 Joined APs** because when the configuration was applied to the APs they restart its association to the controller (they restart the CAPWAP tunnel).

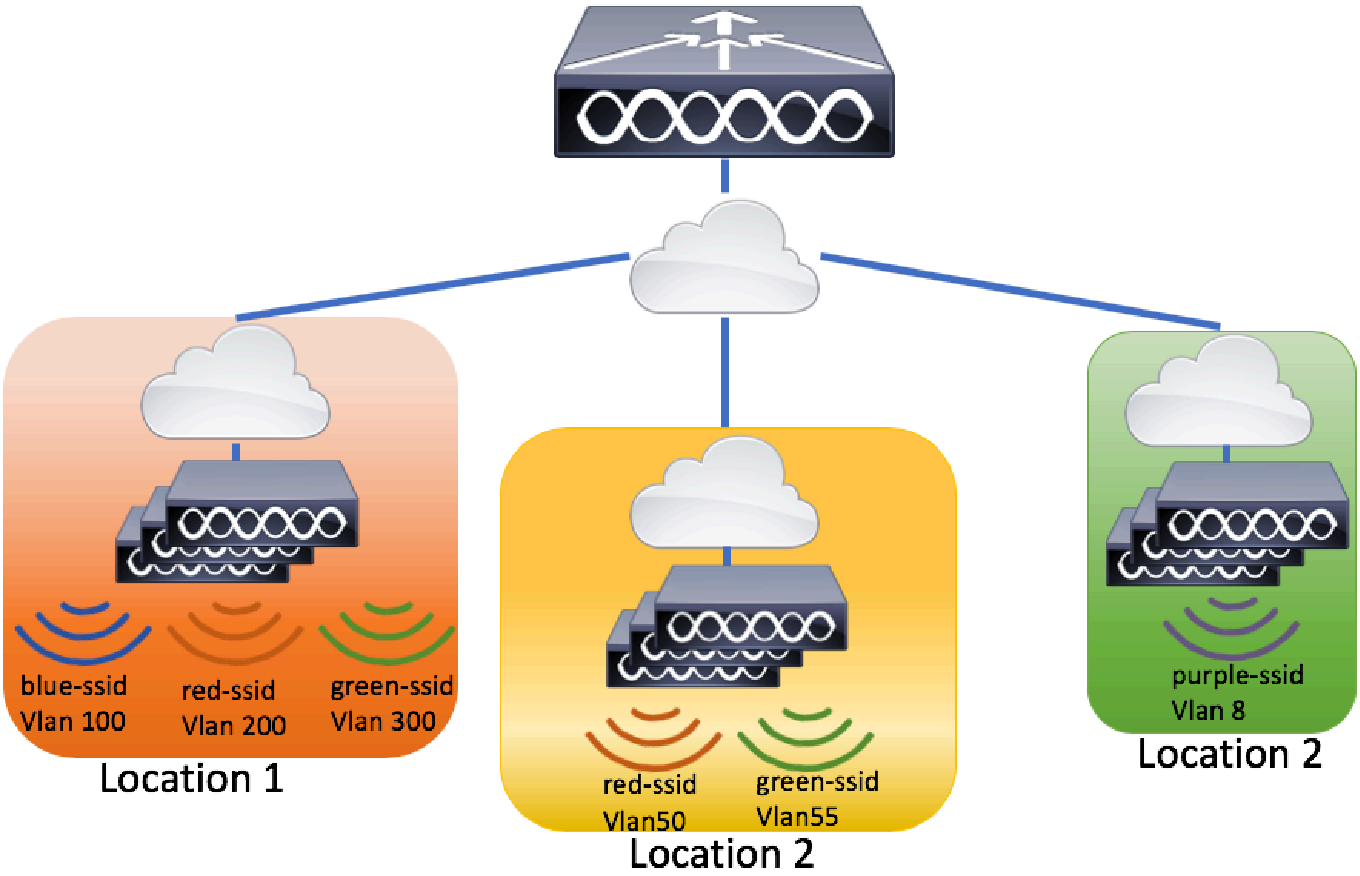


Repeat all the steps described so far for all the locations that are serviced by this 9800 WLC.

If you need to add more APs or WLANs to an established location, you can click on the location and navigate to the relevant tab to make the desired changes.

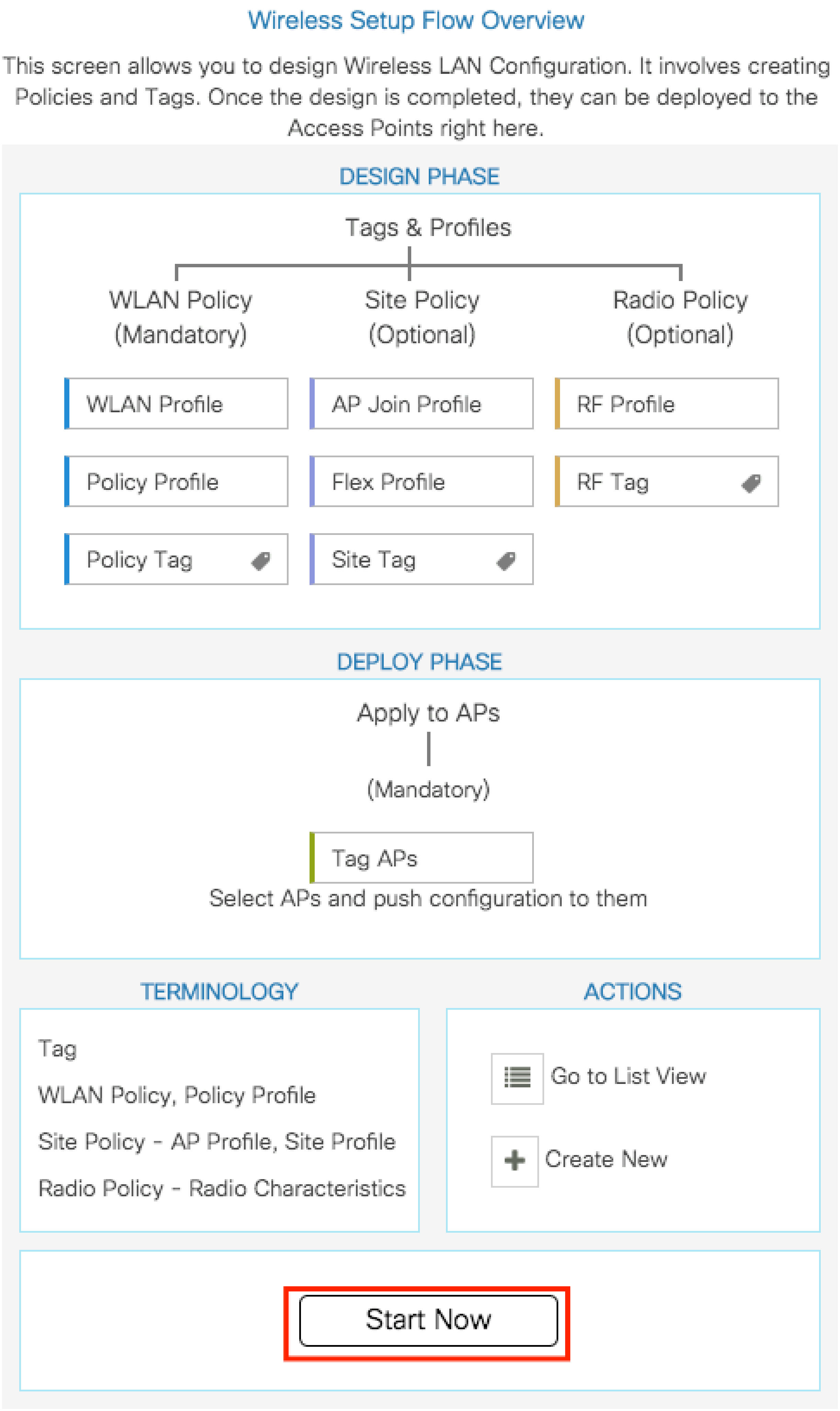
Advanced Wireless Setup

This wizard guides you through an advanced wireless setup. It allows you to segment the APs functions with more detail.



Step 1. Start the Advanced Wireless Setup.

Navigate to **Configuration** > **Wireless Setup** > **Advanced** > **Start Now**.



Wireless Setup Flow Overview

This screen allows you to design Wireless LAN Configuration. It involves creating Policies and Tags. Once the design is completed, they can be deployed to the Access Points right here.

DESIGN PHASE

DEPLOY PHASE

Select APs and push configuration to them

TERMINOLOGY

Tag

WLAN Policy, Policy Profile

Site Policy - AP Profile, Site Profile

Radio Policy - Radio Characteristics

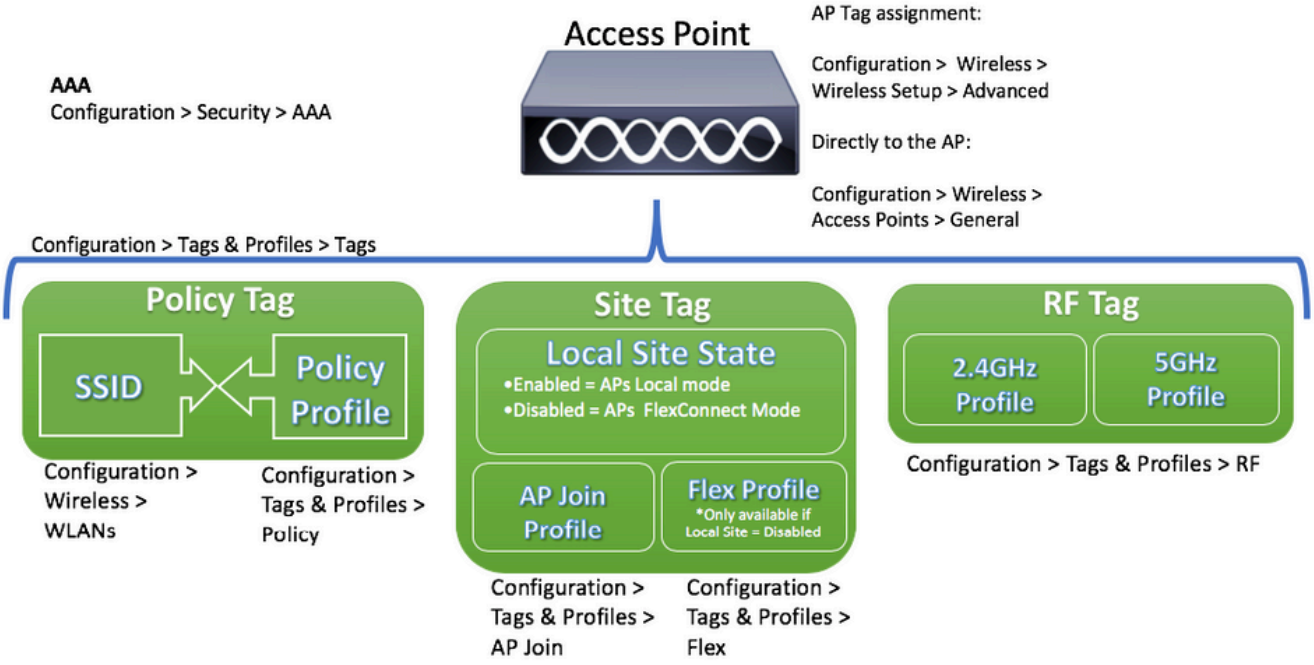
ACTIONS

: Be aware that after change the policy tag on an AP, it loses its association to the 9800 WLCs and join back within about 1 minute.

Menu Based Configuration - Recommended for Established 9800 WLCs Deployment

Instead of a wizard, select which specific elements need to be created or modified.

Visual representation of configuration elements.


Access Point
AP Tag assignment:
Configuration > Wireless > Wireless Setup > Advanced
Directly to the AP:
Configuration > Wireless > Access Points > General
AAA
Configuration > Security > AAA
Configuration > Tags & Profiles > Tags
Policy Tag
SSID
Policy Profile
Configuration > Wireless > WLANs
Configuration > Tags & Profiles > Policy
Site Tag
Local Site State
•Enabled = APs Local mode
•Disabled = APs FlexConnect Mode
AP Join Profile
Flex Profile
*Only available if Local Site = Disabled
Configuration > Tags & Profiles > AP Join
Configuration > Tags & Profiles > Flex
RF Tag
2.4GHz Profile
5GHz Profile
Configuration > Tags & Profiles > RF

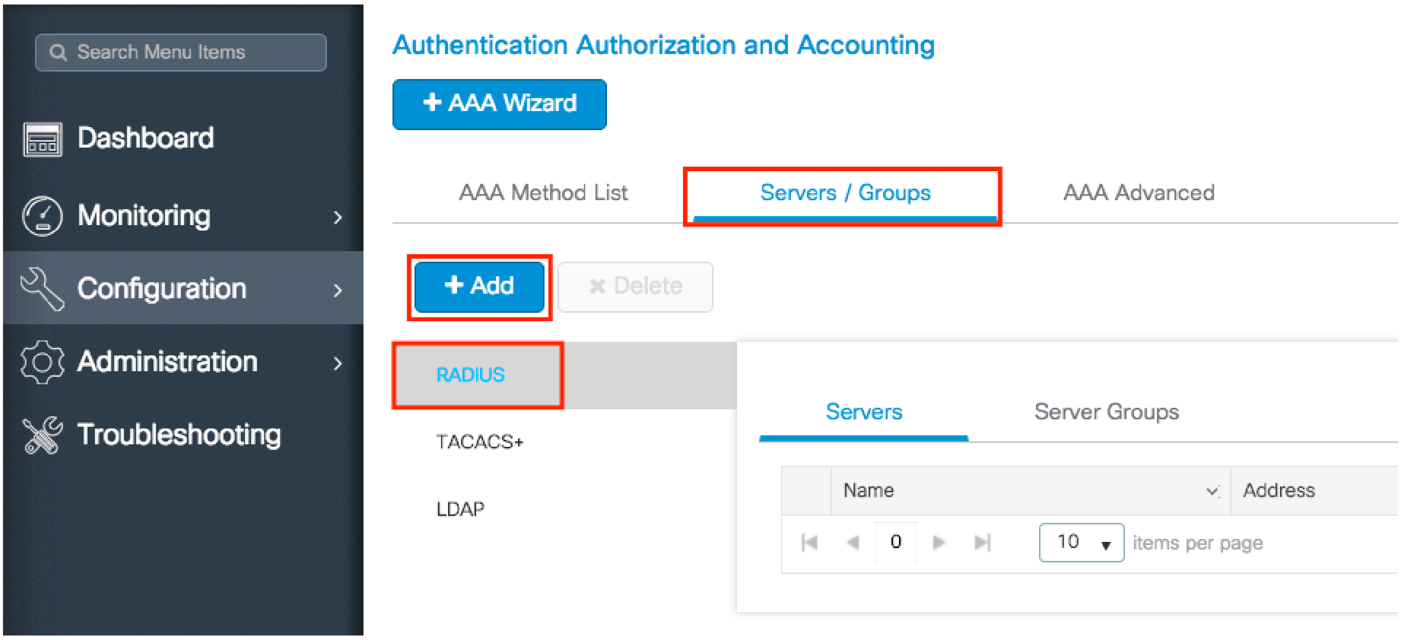
AAA on 9800 WLCs

Recommended flow of configuration:

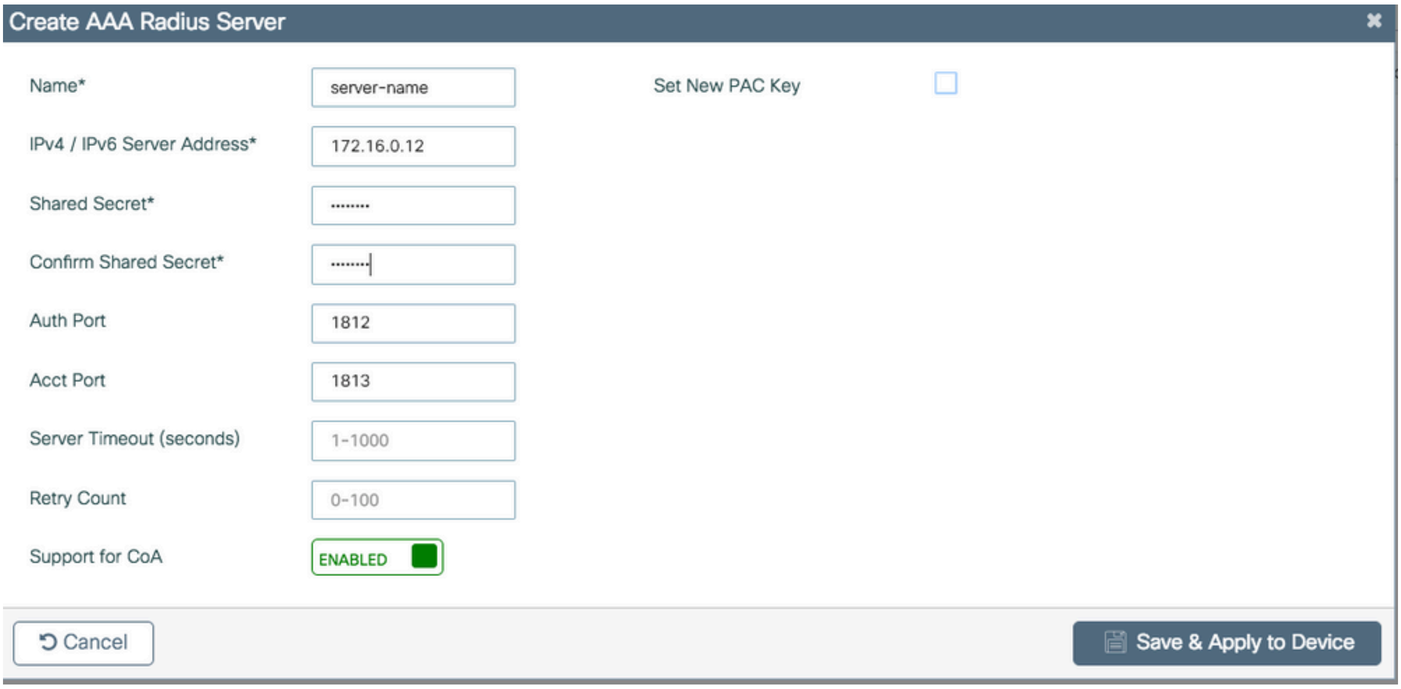
1. Add the RADIUS server
2. Create a RADIUS group
3. Create the AAA methods

Add the RADIUS server

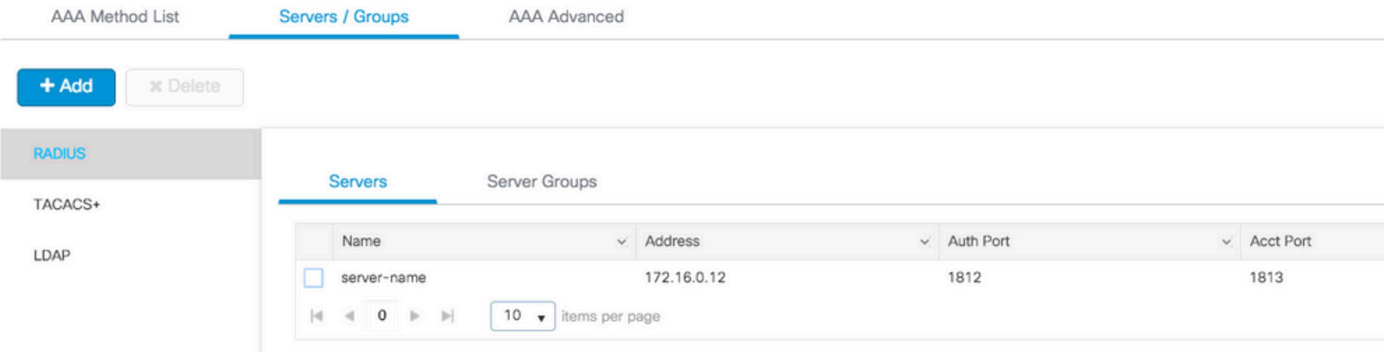
Step 1. **Navigate to Configuration** > **Security** > **AAA** > **Servers/Groups** > **Servers** > **RADIUS** > **+ Add**.



Step 2. Enter all the needed information. Once done, click **Save & Apply to Device**.


Create AAA Radius Server

Name*	server-name
IPv4 / IPv6 Server Address*	172.16.0.12
Shared Secret*	········
Confirm Shared Secret*	········
Auth Port	1812
Acct Port	1813
Server Timeout (seconds)	1-1000
Retry Count	0-100
Support for CoA	ENABLED
Set New PAC Key	□



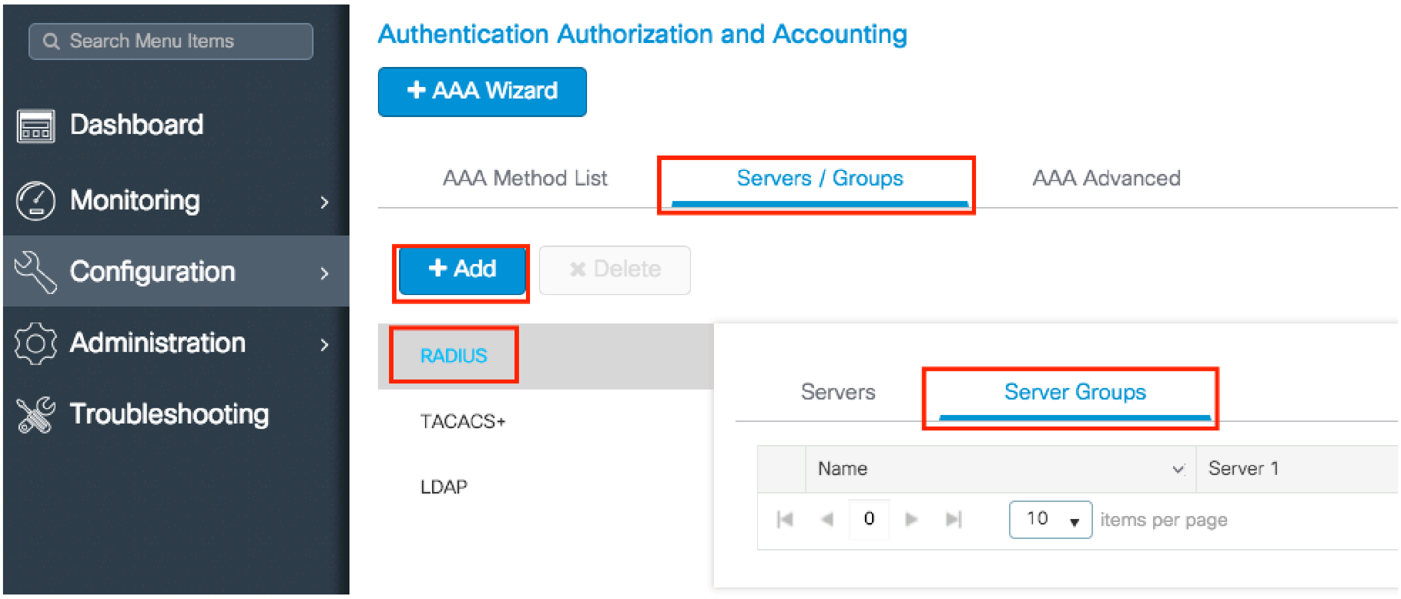
	Name	Address	Auth Port	Acct Port
□	server-name	172.16.0.12	1812	1813

CLI:

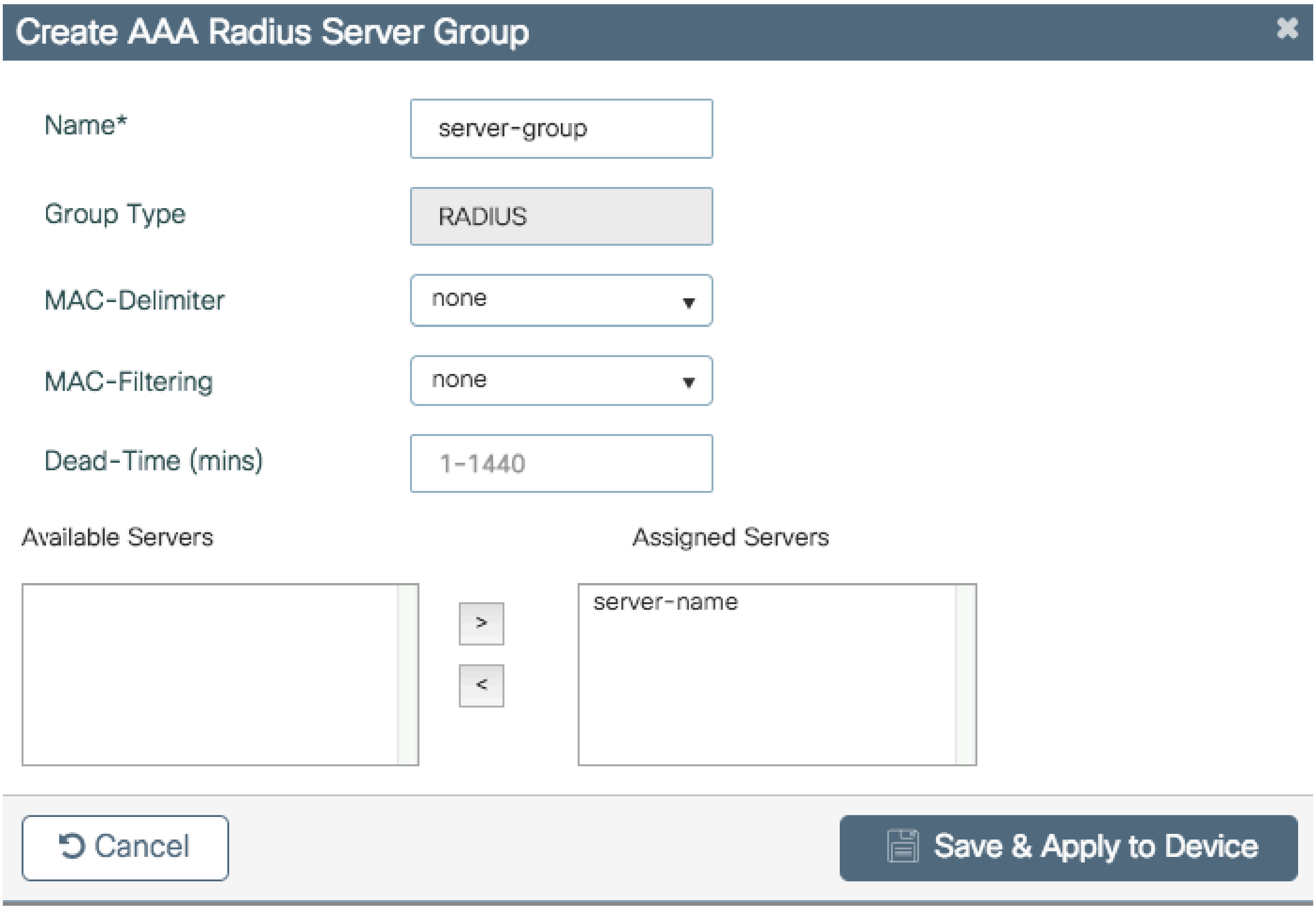
```
# config t
# radius server server-name
# address ipv4 172.16.0.12 auth-port 1812 acct-port 1813
# key <shared-key>
# exit

# aaa server radius dynamic-author
# client 172.16.0.12 server-key cisco123
# end
```

Create a RADIUS group

Step 1. Navigate to **Configuration** > **Security** > **AAA** > **Servers/Groups** > **Servers** > **RADIUS** > + **Add**.

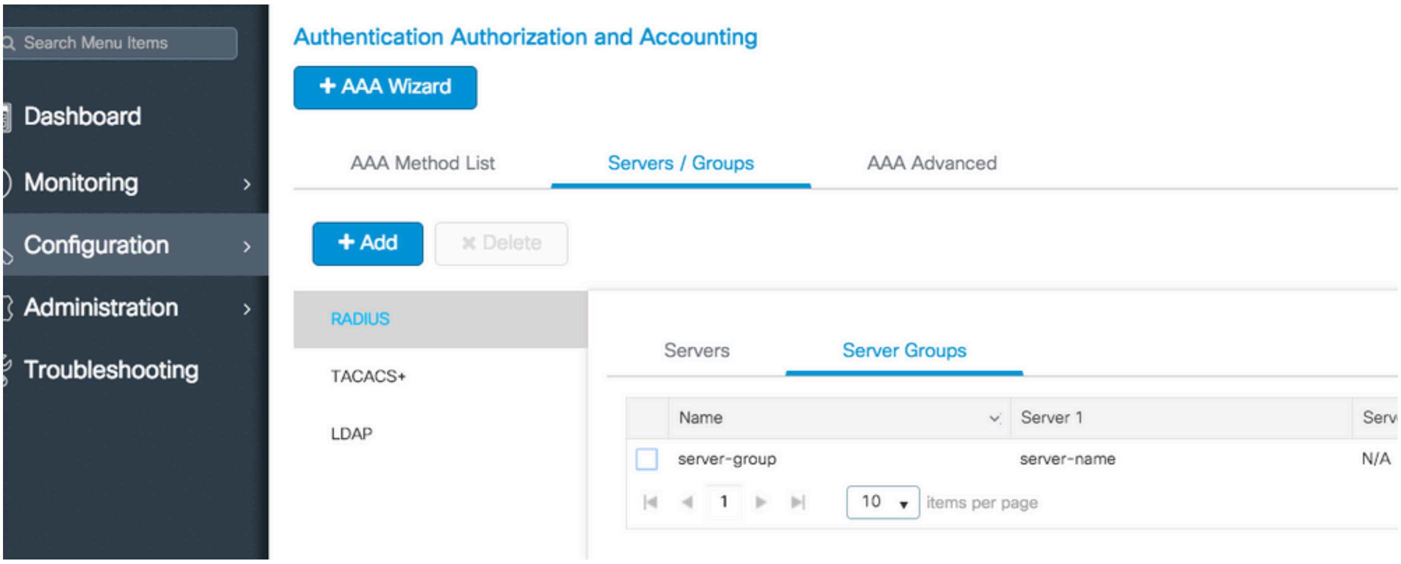


Step 2. Enter the needed information and ensure you move the server recently created to the **Assigned Servers** section.


Create AAA Radius Server Group

Name*	server-group
Group Type	RADIUS
MAC-Delimiter	none
MAC-Filtering	none
Dead-Time (mins)	1-1440

Available Servers	Assigned Servers
	server-name



	Name	Server 1	Serv
□	server-group	server-name	N/A

CLI:

```
# config t
# aaa group server radius server-group
# server name server-name
# end
```

Create the AAA methods

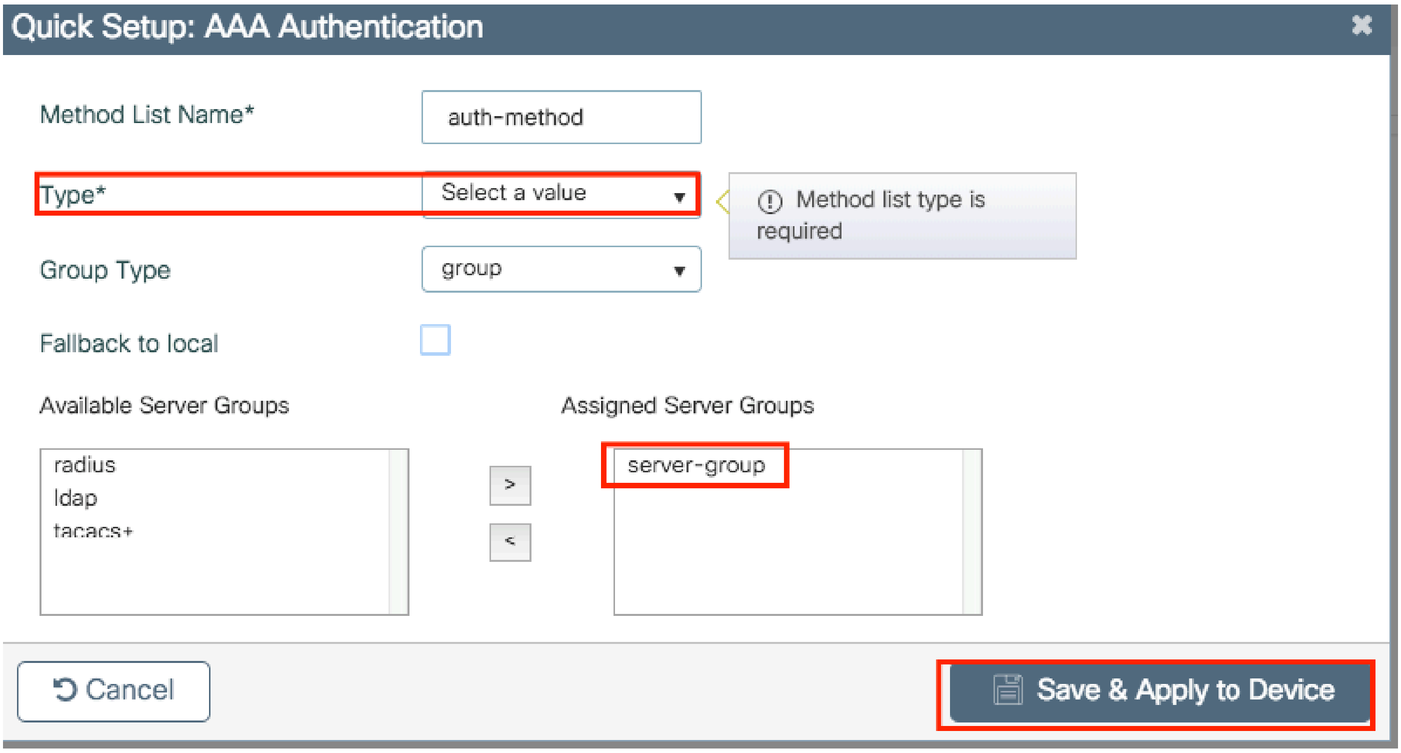
Step 1. Navigate to **Configuration** > **Security** > **AAA** > **AAA Method List** > **Authentication** > **+ Add**.

Based on the kind of security needed on your SSIDs is the type of of authentication you can choose.

- Type dot1x = Used on 802.1x SSIDs
- Type login = Used on WebAuth SSIDs

Group Type setting allows you to choose if the authentication must be sent to the external RADIUS server that was created or local.

- Group Type group = External RADIUS server
- Group Type local = Local authentication



Quick Setup: AAA Authentication

Method List Name* auth-method

Type* Select a value

Method list type is required

Group Type group

Fallback to local □

Available Server Groups: radius, ldap, tacacs+

Assigned Server Groups: server-group

Step 2. (optional) Create Authorization/Accounting methods as needed.

```
# config t
# aaa authentication login <login-method-name> group server-group
# aaa authentication dot1x <dot1x-method-name> group server-group
```

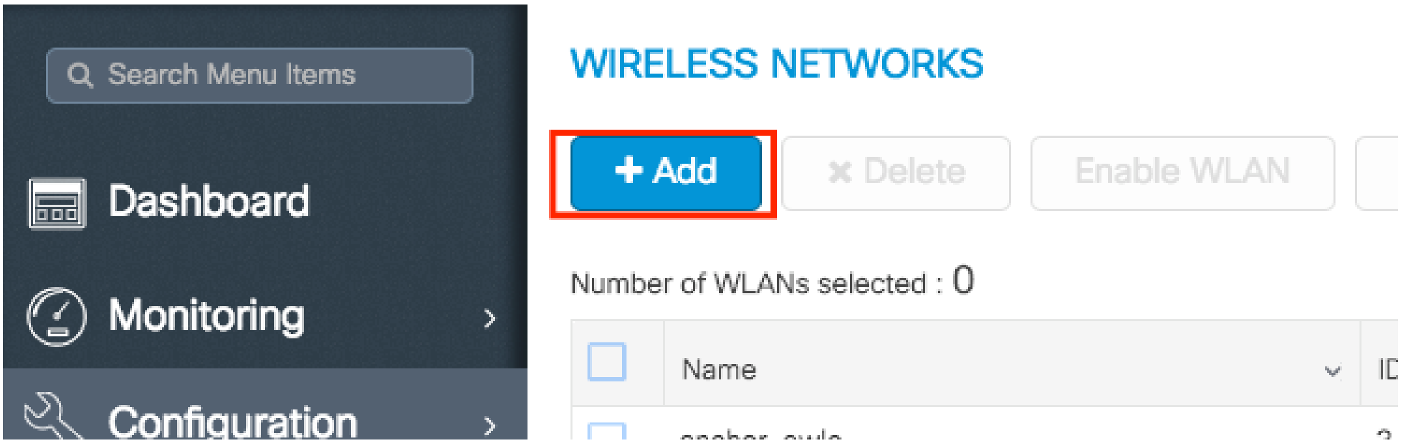
WLANs on 9800 WLCs

Recommended flow of configuration:

1. Create your SSID
2. Create/Modify a Policy Profile
3. Create/Modify a Policy Tag (Link the SSID to the desired Policy Profile)
4. If needed, assign the Policy Tag to the AP

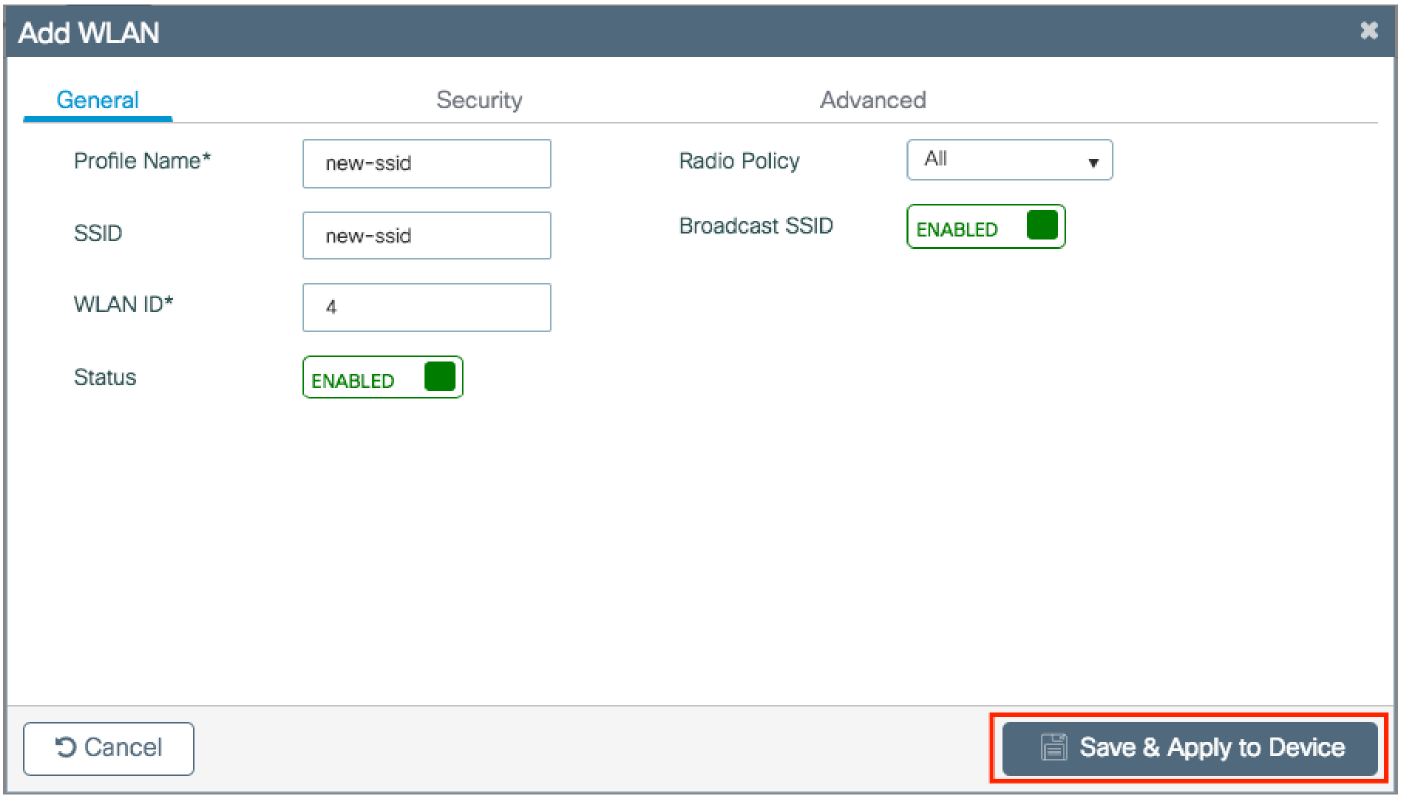
Create your SSID

Step 1. Navigate to **Configuration** > **Wireless** > **WLANs** > + **Add**.



Number of WLANs selected : 0

Step 2. Enter all the needed information (SSID name, security type and so on) and once done, click **Save & Apply to Device**.



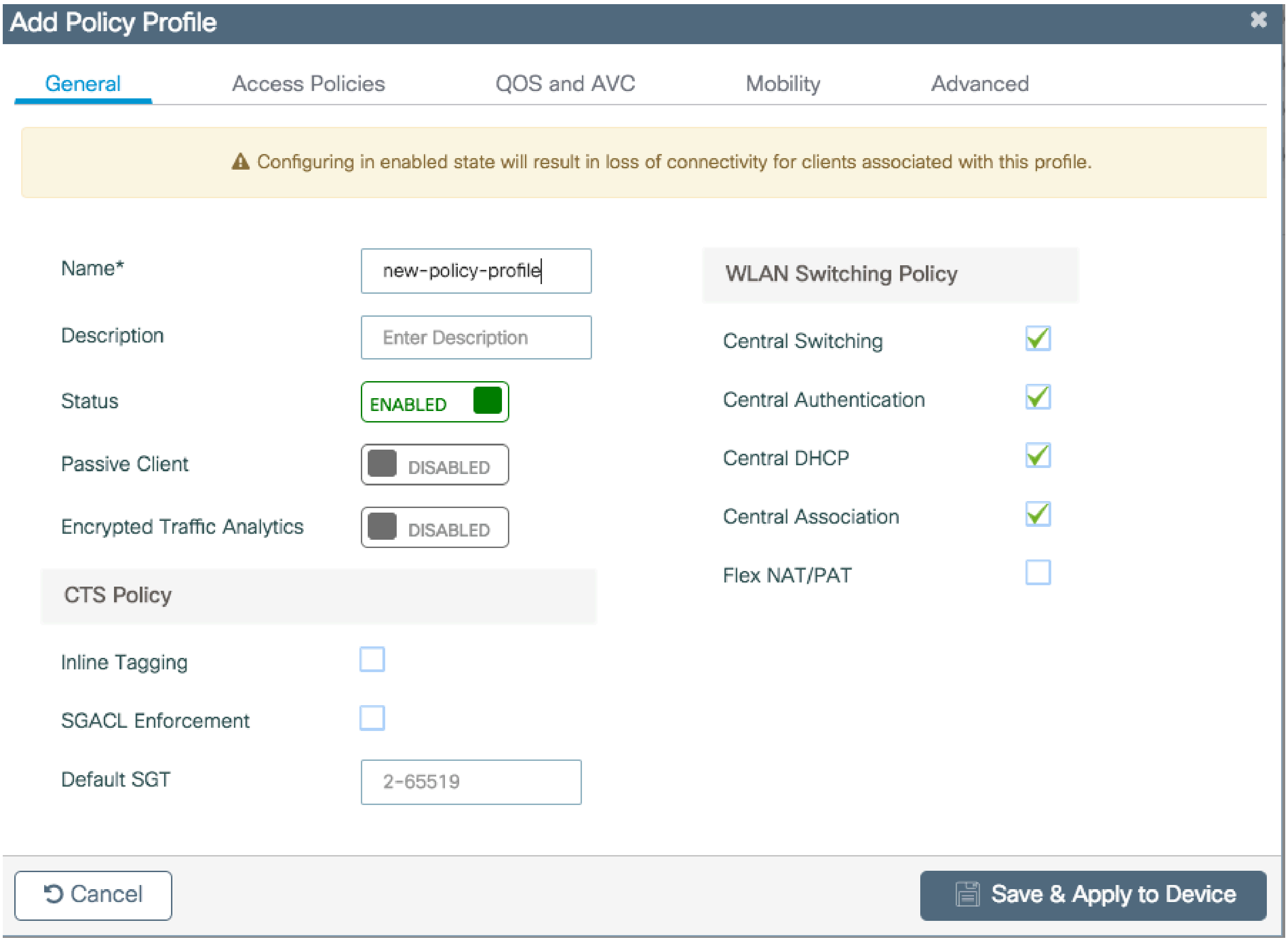
Profile Name*	new-ssid	Radio Policy	All
SSID	new-ssid	Broadcast SSID	ENABLED
WLAN ID*	4		
Status	ENABLED		

CLI:

```
# config t
# wlan <profile-name> <wlan-id> <ssid-name>
# ----desired settings----
# no shutdown
```

Create/Modify a Policy Profile

Step 1. Navigate to **Configuration** > **Tags & Profiles** > **Policy**. Either select the name of an established one or click + **Add** to add a new one. Ensure it is enabled, set the needed VLAN and any other parameter you want to customize.



⚠ Configuring in enabled state will result in loss of connectivity for clients associated with this profile.

Name* new-policy-profile

Description Enter Description

Status ENABLED

Passive Client DISABLED

Encrypted Traffic Analytics DISABLED

CTS Policy

Inline Tagging □

SGACL Enforcement □

Default SGT 2-65519

WLAN Switching Policy

Central Switching ☑

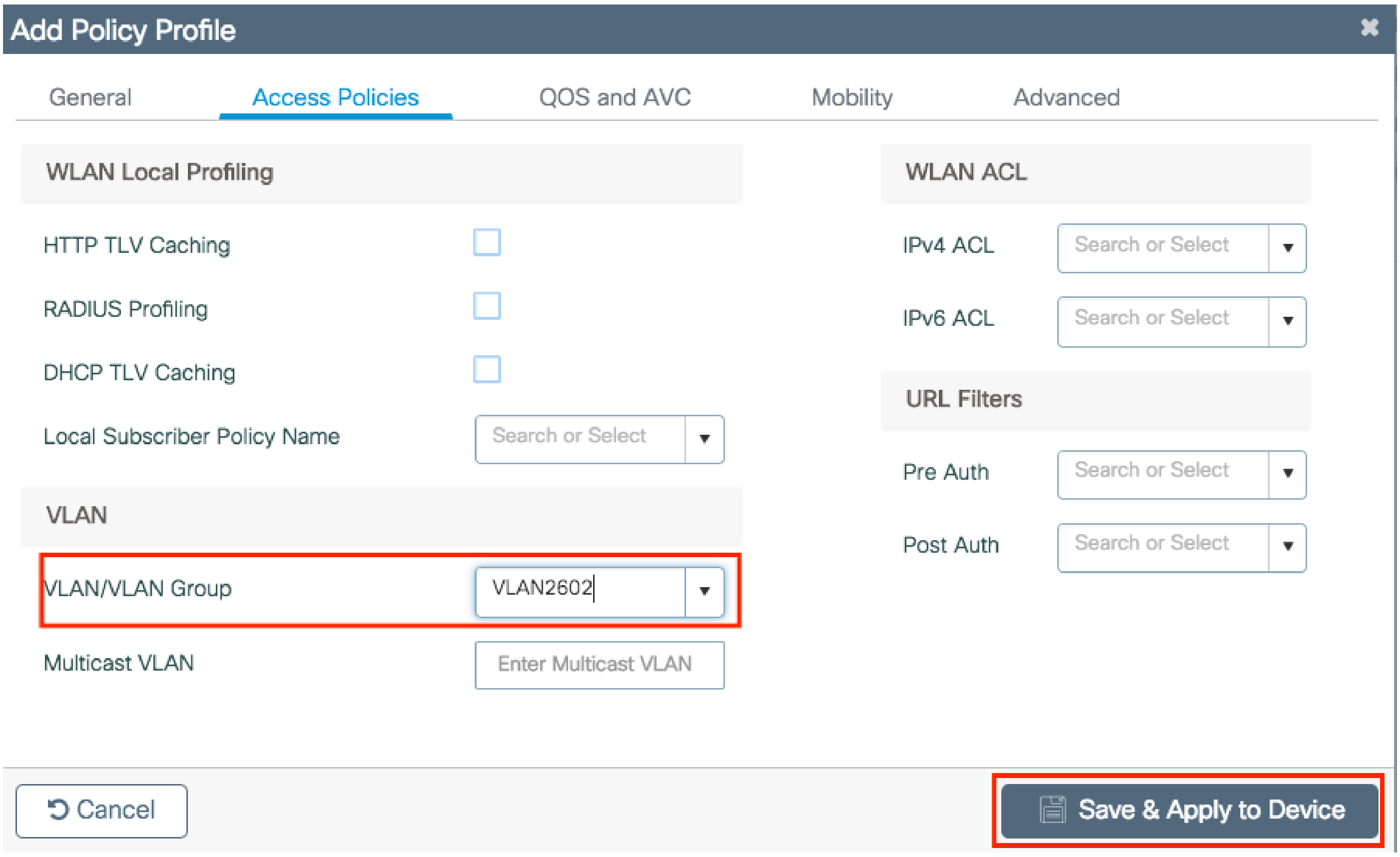
Central Authentication ☑

Central DHCP ☑

Central Association ☑

Flex NAT/PAT □

Step 2. Once done, click **Save & Apply to Device**.



Add Policy Profile

WLAN Local Profiling

HTTP TLV Caching □

RADIUS Profiling □

DHCP TLV Caching □

Local Subscriber Policy Name: Search or Select

VLAN

VLAN/VLAN Group: VLAN2602

Multicast VLAN: Enter Multicast VLAN

WLAN ACL

IPv4 ACL: Search or Select

IPv6 ACL: Search or Select

URL Filters

Pre Auth: Search or Select

Post Auth: Search or Select

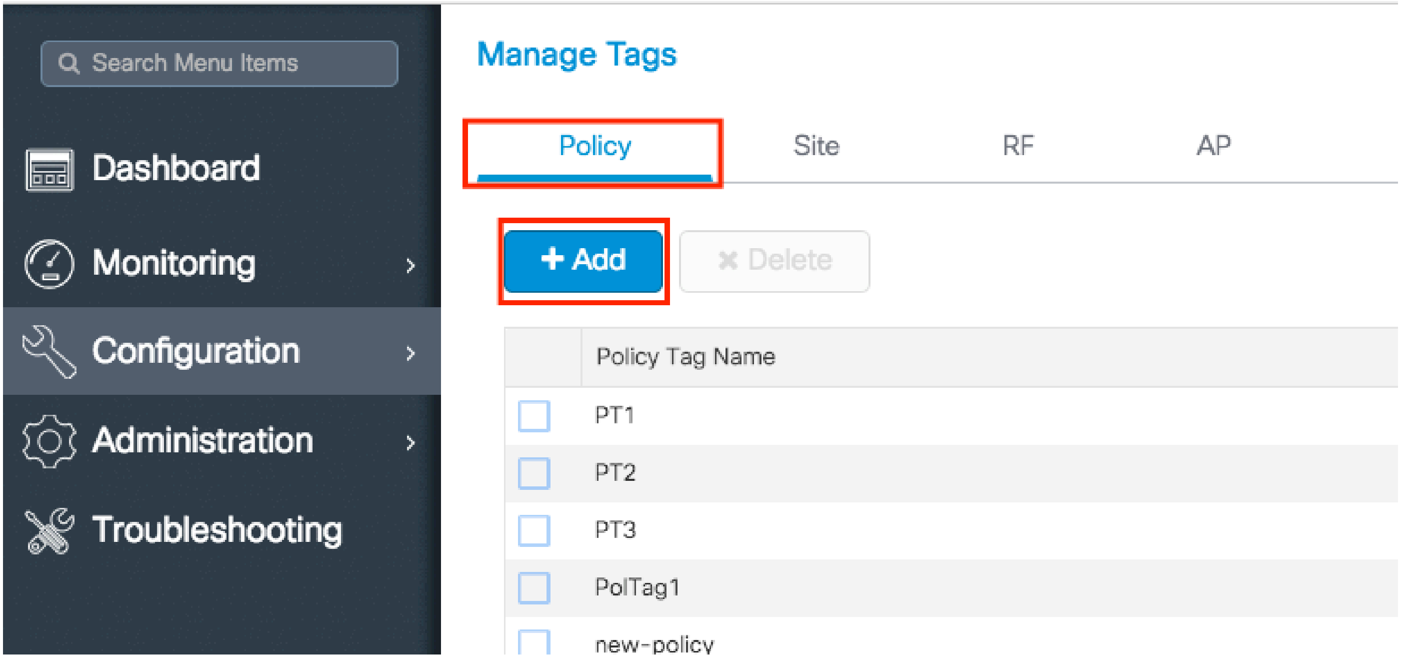
CLI:

```
# wireless profile policy new-policy-profile
# vlan <vlan-id_or_vlan-name>
# ------any other desired setting------
# no shutdown
```

Create/Modify a Policy Tag

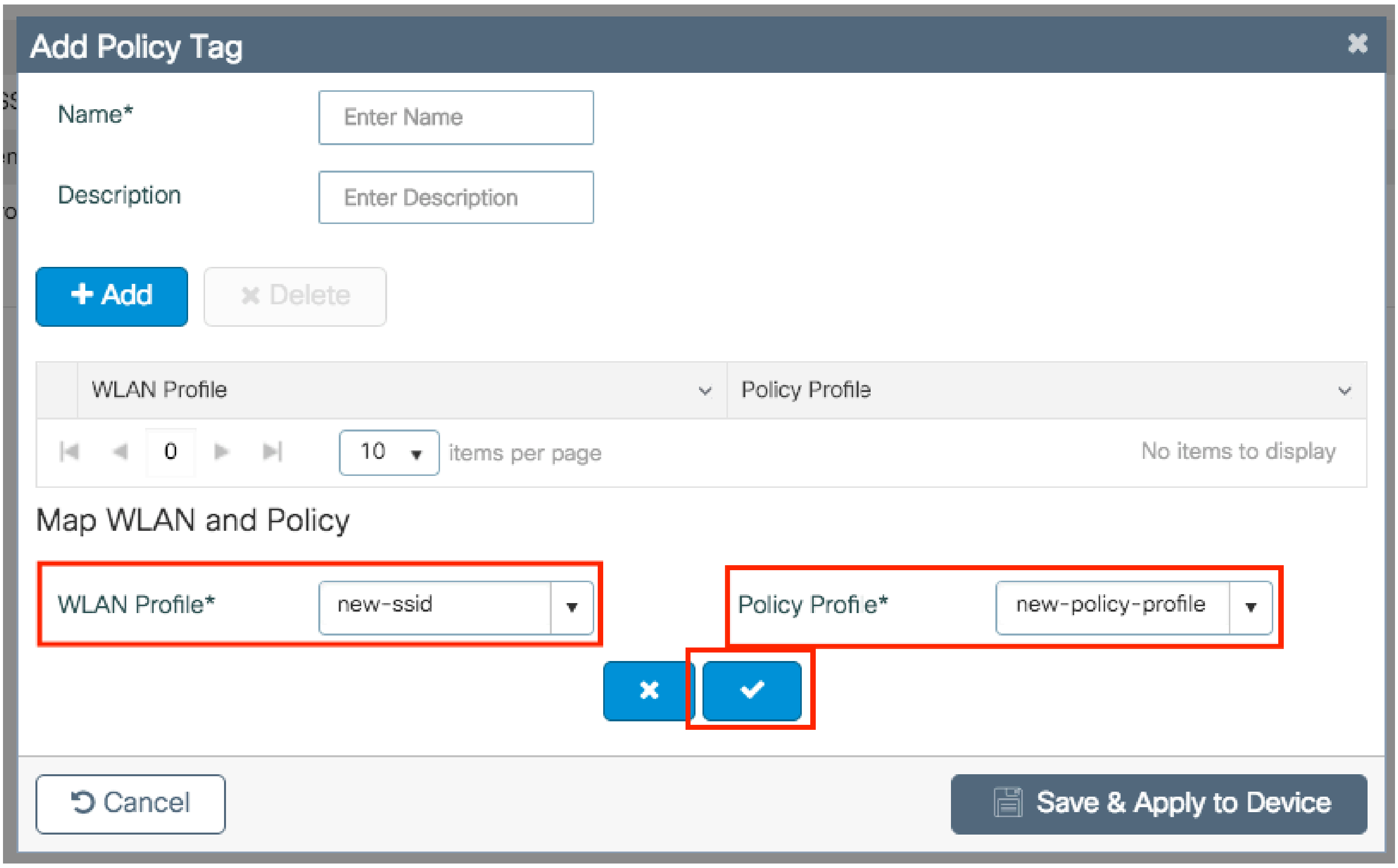
The Policy tag is the setting that allows you to specify which SSID is linked to which Policy Profile.

Step 1. Navigate to **Configuration** > **Tags & Profiles** > **Tags** > **Policy**. Either select the name of an established one or click **+ Add** to add a new one.



	Policy Tag Name
□	PT1
□	PT2
□	PT3
□	PolTag1
□	new-policy

Step 2. Inside the **Policy Tag**, click **+Add**, from the drop down list select the WLAN Profile name you want to add to the Policy Tag and Policy Profile to which you want to link. After that, click the checkmark.



Name*: Enter Name

Description: Enter Description

WLAN Profile	Policy Profile

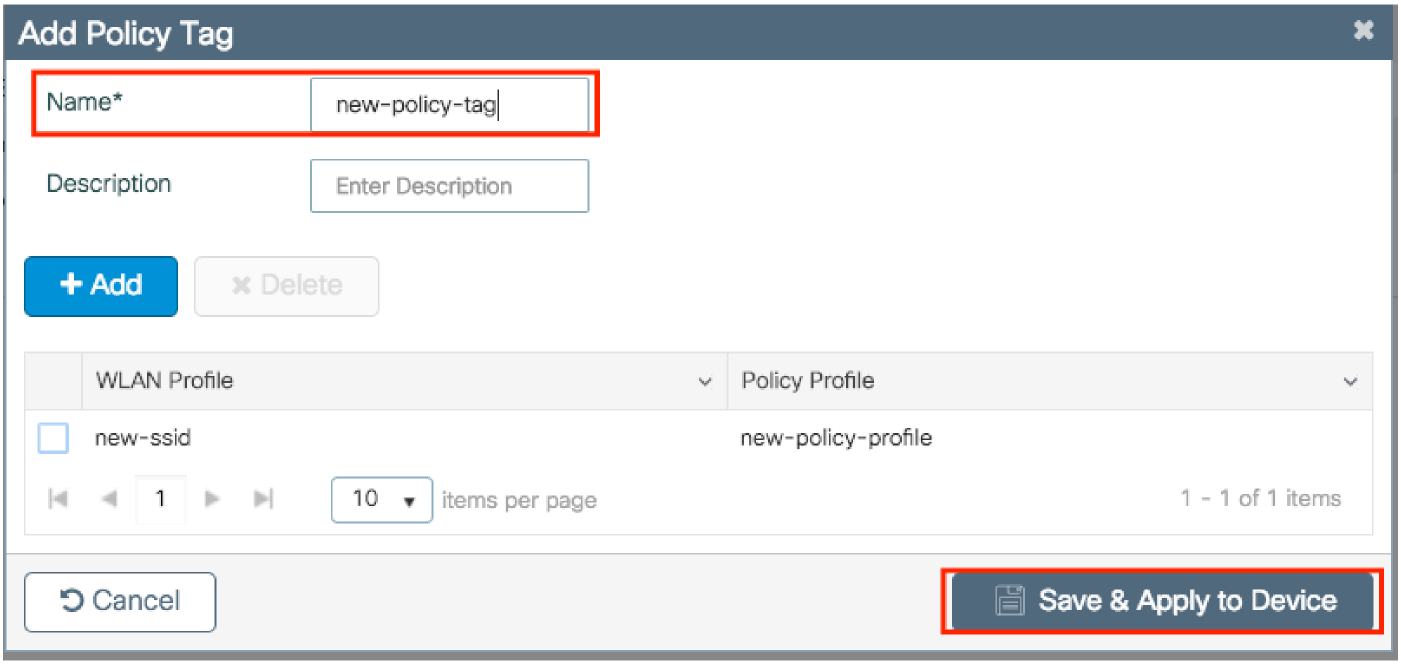
0 | 10 items per page | No items to display

Map WLAN and Policy

WLAN Profile*: new-ssid

Policy Profile*: new-policy-profile

Step 3. Repeat step 2 for all the WLANs that you want to add. Once done, click **Save & Apply to Device**. Do not forget to assign a name to the new Policy Tag.



CLI:

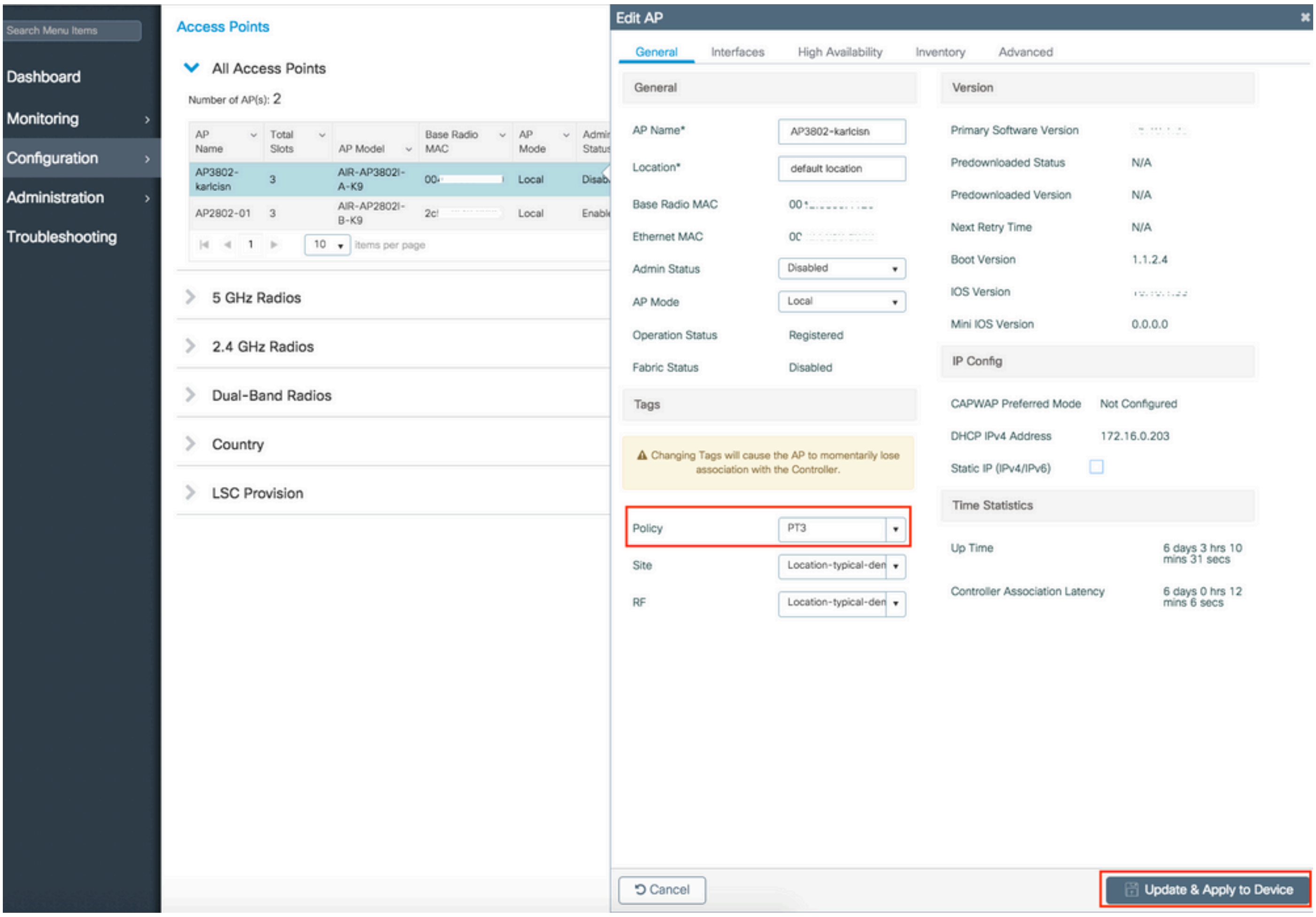
```
# config t
# wireless tag policy <policy-tag-name>
# wlan <ssid-name> policy <policy-profile-name>
# end
```

Policy Tag Assignation

You can assign a Policy Tag directly to an AP or assign the same Policy Tag to a group of APs at the same time. Choose the one that fits you.

Policy Tag Assignation per AP

Navigate to **Configuration** > **Wireless** > **Access Points** > **AP name** > **General** > **Tags**. From the Policy dropdown list, select the desired Policy Tag and click **Update & Apply to Device**.



Access Points

All Access Points

Number of AP(s): 2

AP Name	Total Slots	AP Model	Base Radio MAC	AP Mode	Admin Status
AP3802-karlcisn	3	AIR-AP3802I-A-K9	00[redacted]	Local	Disab
AP2802-01	3	AIR-AP2802I-B-K9	2c[redacted]	Local	Enable

Edit AP

General

AP Name*: AP3802-karlcisn

Location*: default location

Base Radio MAC: 00[redacted]

Ethernet MAC: 00[redacted]

Admin Status: Disabled

AP Mode: Local

Operation Status: Registered

Fabric Status: Disabled

Tags

⚠ Changing Tags will cause the AP to momentarily lose association with the Controller.

Policy: PT3

Site: Location-typical-den

RF: Location-typical-den

Version

Primary Software Version: [redacted]

Predownloaded Status: N/A

Predownloaded Version: N/A

Next Retry Time: N/A

Boot Version: 1.1.2.4

IOS Version: [redacted]

Mini IOS Version: 0.0.0.0

IP Config

CAPWAP Preferred Mode: Not Configured

DHCP IPv4 Address: 172.16.0.203

Static IP (IPv4/IPv6): □

Time Statistics

Up Time: 6 days 3 hrs 10 mins 31 secs

Controller Association Latency: 6 days 0 hrs 12 mins 6 secs

Note: Be aware that after change the policy tag on an AP, it loses its association to the 9800 WLCs and join back within about 1 minute.

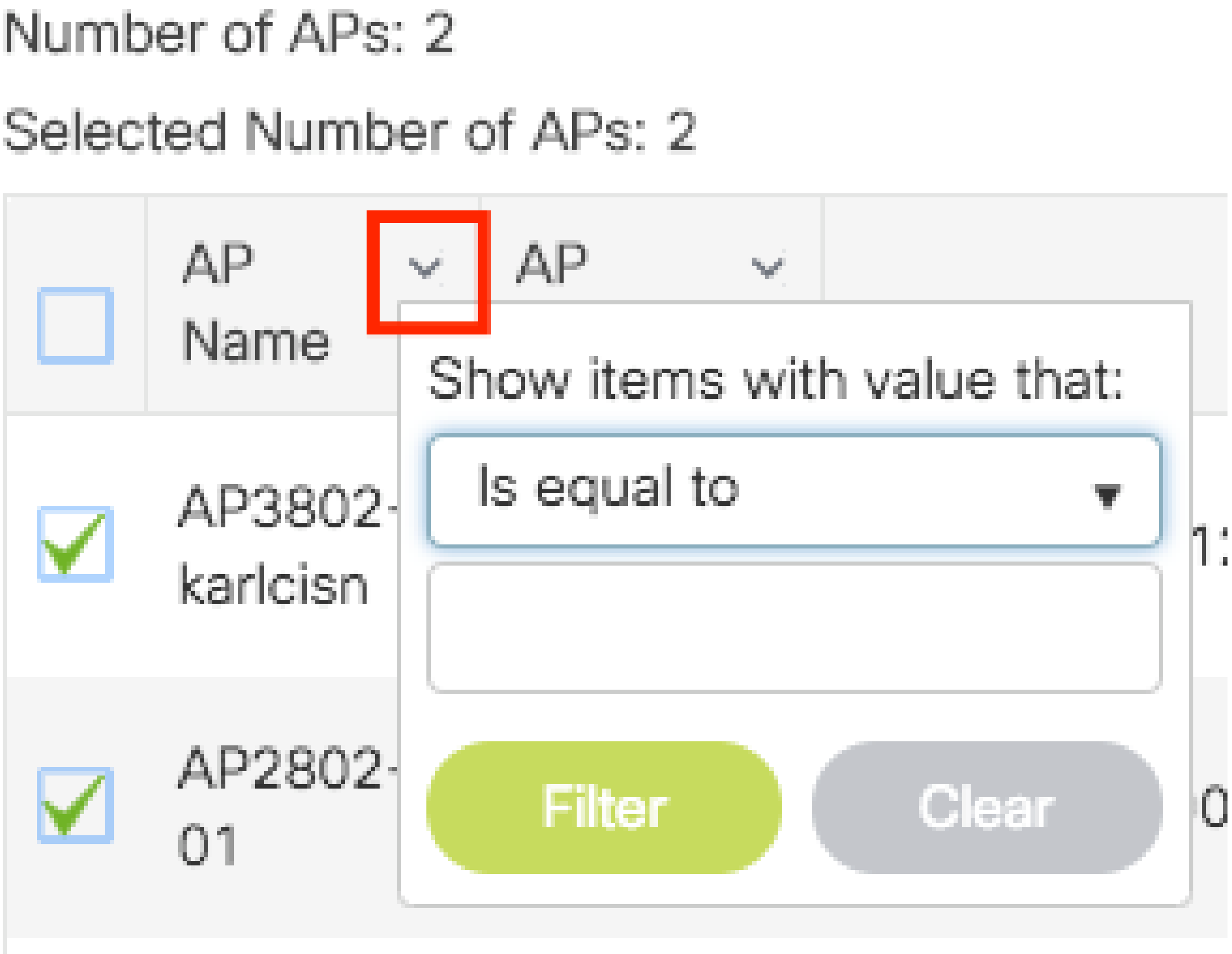
CLI:

```
# config t
# ap <ethernet-mac-addr>
# policy-tag <policy-tag-name>
# end
```

Policy Tag Assignation for Multiple APs

Navigate to **Configuration > Wireless Setup > Advanced > Start Now**.

Click on Tag APs **:= icon**. Select the list of APs that you want to assign the tags to (You can click on the point down arrow next to AP name [or any other field] to filter the list of APs).

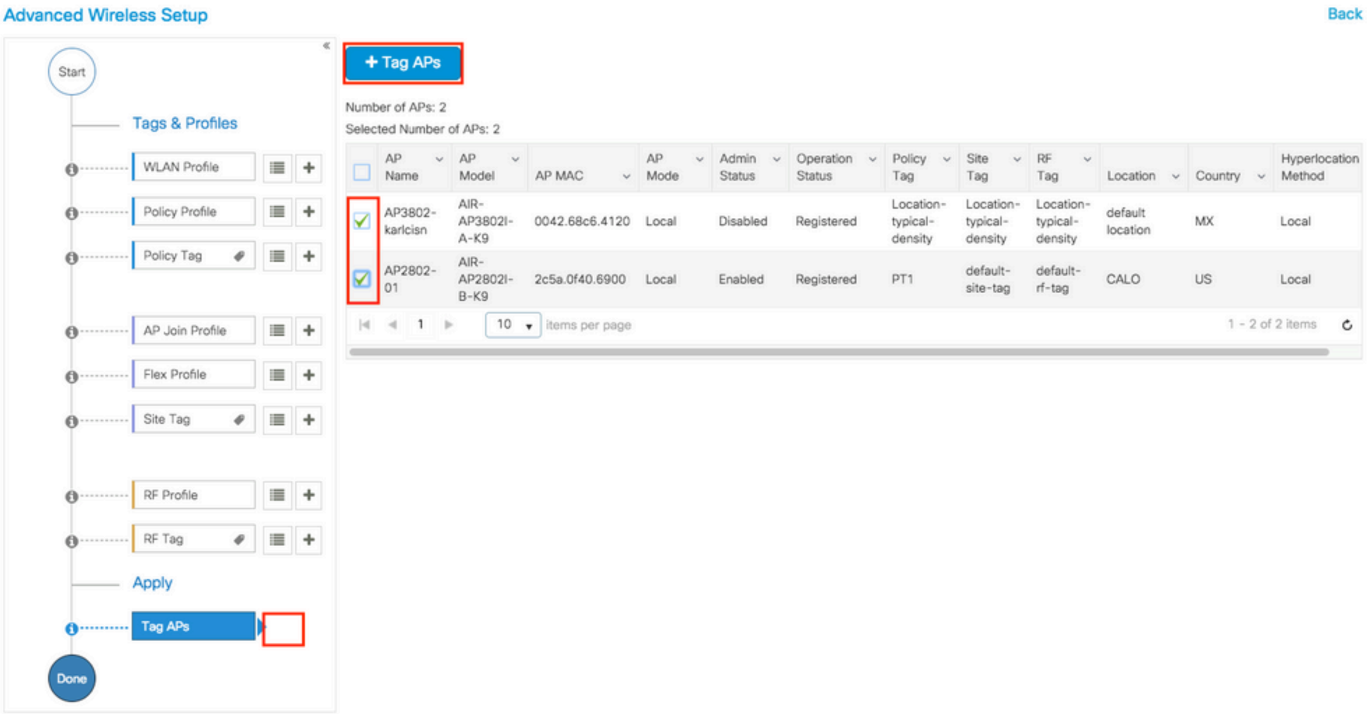


Number of APs: 2

Selected Number of APs: 2

□	AP Name	AP
☑	AP3802-karlcisn	
☑	AP2802-01	

Once you have selected the desired APs, click on **+ Tag APs**.



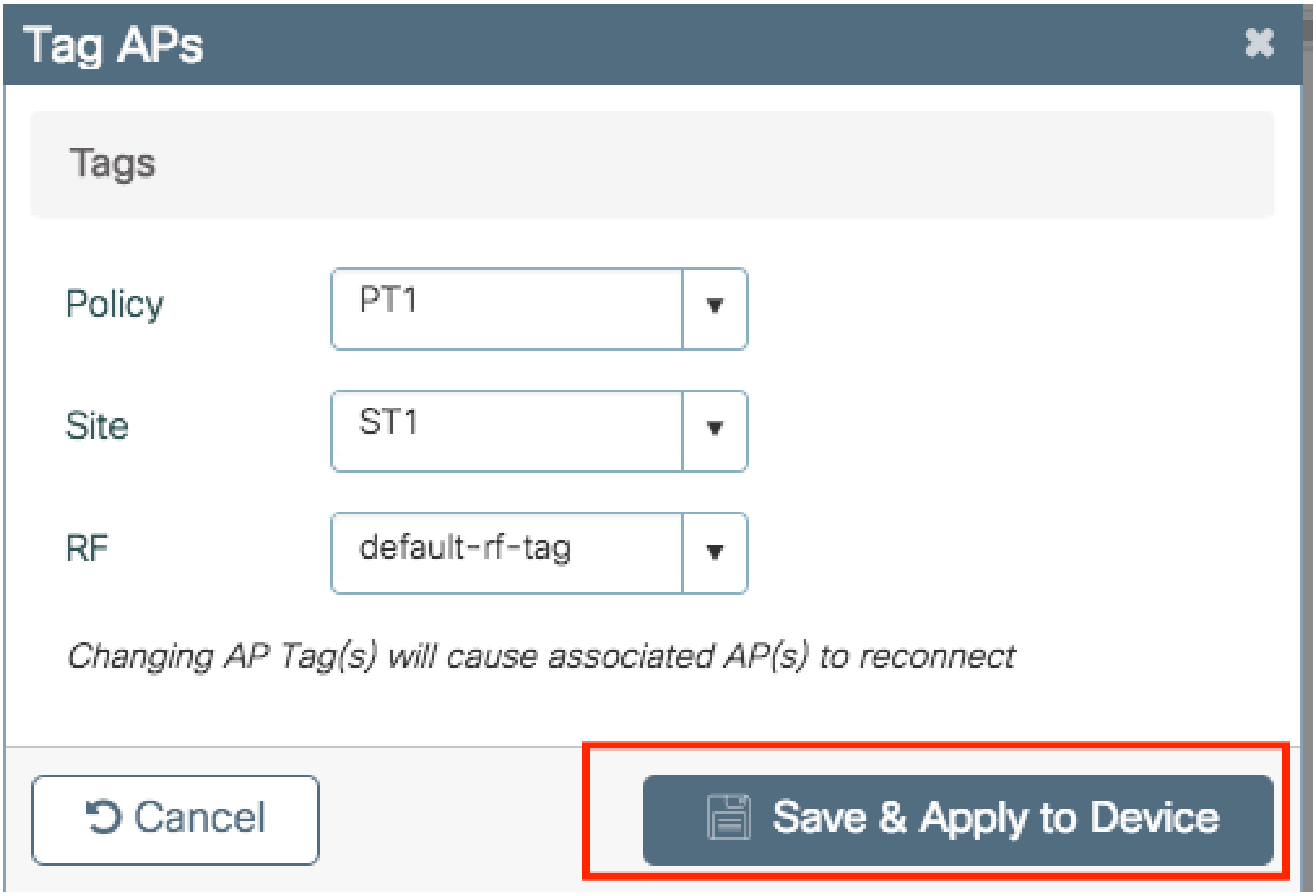
Number of APs: 2

Selected Number of APs: 2

□	AP Name	AP Model	AP MAC	AP Mode	Admin Status	Operation Status	Policy Tag	Site Tag	RF Tag	Location	Country	Hyperlocation Method
☑	AP3802-karlcisn	AIR-AP3802I-A-K9	0042.68c6.4120	Local	Disabled	Registered	Location-typical-density	Location-typical-density	Location-typical-density	default location	MX	Local
☑	AP2802-01	AIR-AP2802I-B-K9	2c5a.0f40.6900	Local	Enabled	Registered	PT1	default-site-tag	default-rf-tag	CALO	US	Local

1 | 10 items per page | 1 - 2 of 2 items

Select the tags that you want to assign to the APs and click **Save & Apply to Device**.



Tag APs

Tags

Policy: PT1

Site: ST1

RF: default-rf-tag

Changing AP Tag(s) will cause associated AP(s) to reconnect

Note: Be aware that when policy tag on an AP is chnaged, it loses its association to the 9800 WLCs and joins back within about one (1) minute.

CLI:

There is no CLI option to assign the same Tag to multiple APs.

AP Join Settings on 9800 WLCs

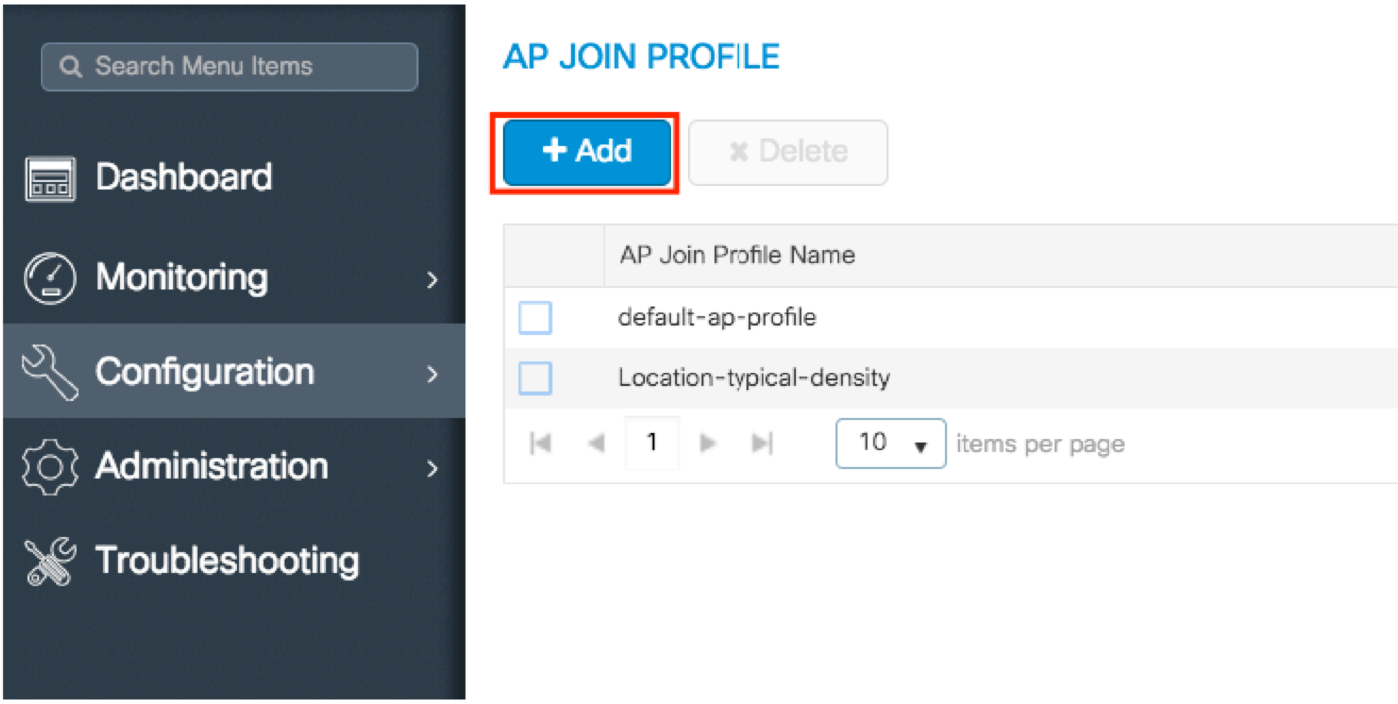
Recommended flow of configuration:

1. Create/Modify an AP Join Profile
2. (Optional) Create/Modify a Flex Profile (If AP in Flex Mode)
3. Create/Modify a Site Tag
4. If needed, assign the Site Tag to the AP

Create/Modify an AP Join Profile

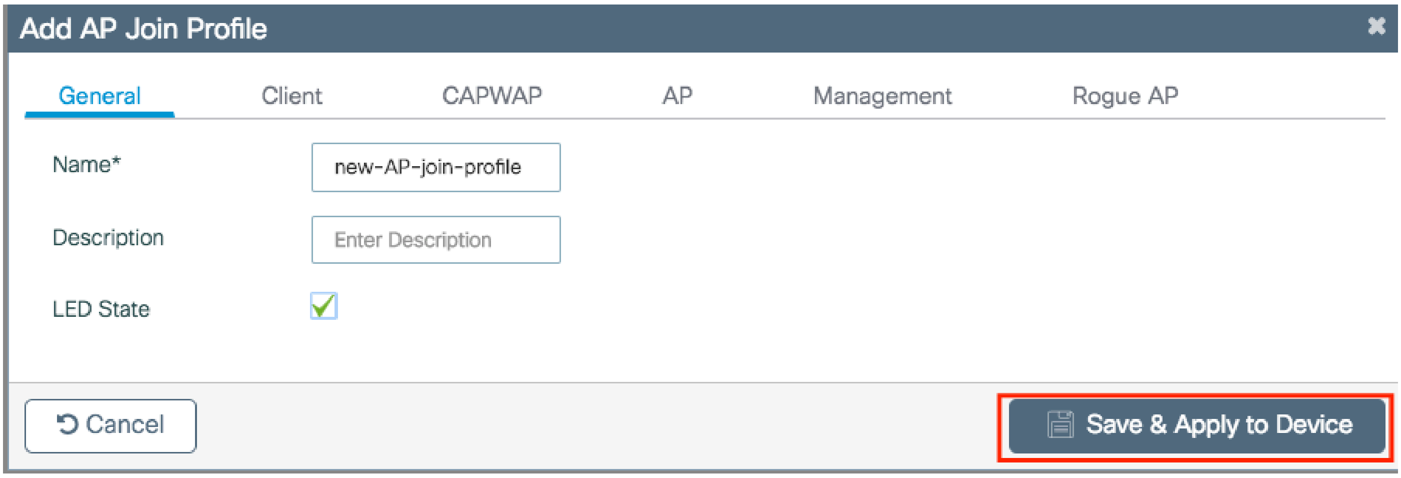
Step 1. Navigate to **Configuration** > **Tags & Profiles** > **AP Join**.

Select either the name of an established one or click **+ Add** to add a new one.



	AP Join Profile Name
□	default-ap-profile
□	Location-typical-density

Step 2. Modify the profile as desired. Once done, click **Save & Apply to Device**.



Name*	new-AP-join-profile
Description	Enter Description
LED State	☑

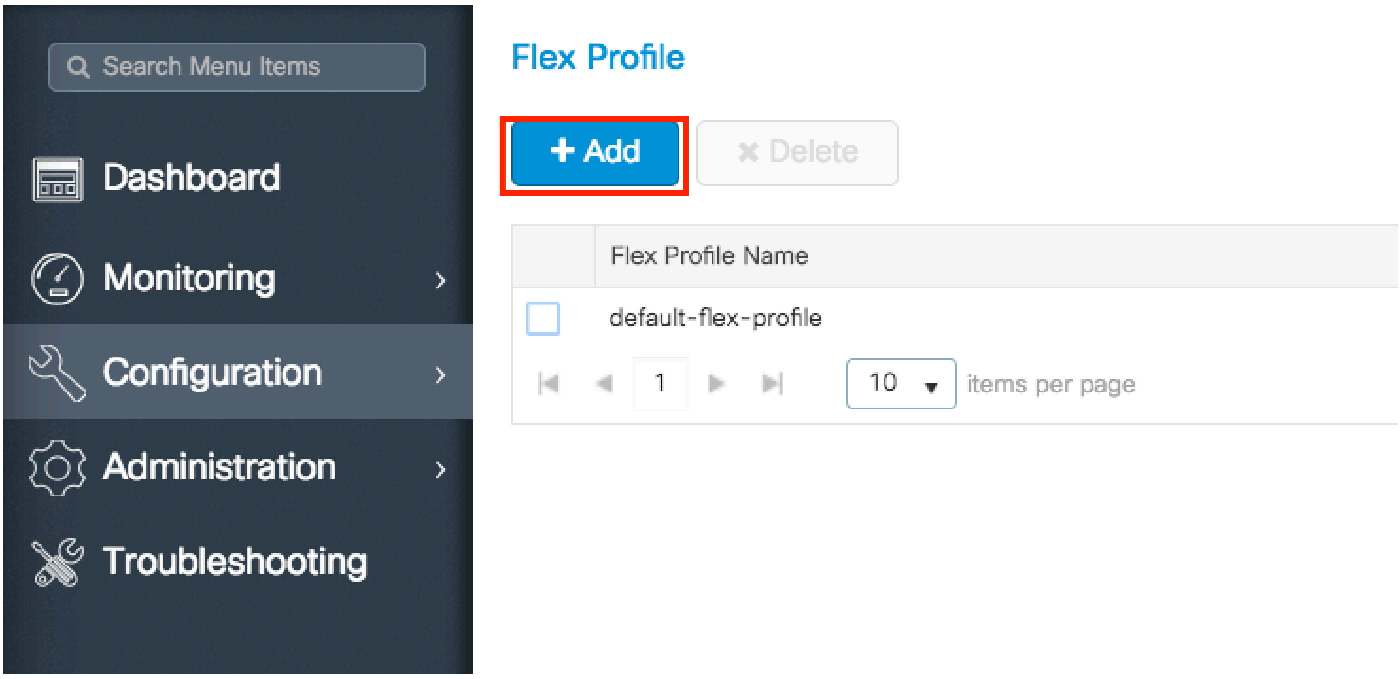
CLI:

```
# config t
# ap profile <ap-join-profile-name>
# -------desired settings------
# end
```

Create/Modify a Flex Profile (If AP in Flex Mode)

Step 1. Navigate to **Configuration** > **Tags & Profiles** > **Flex**.

Either select the name of an established one or click **+ Add** to add a new one.

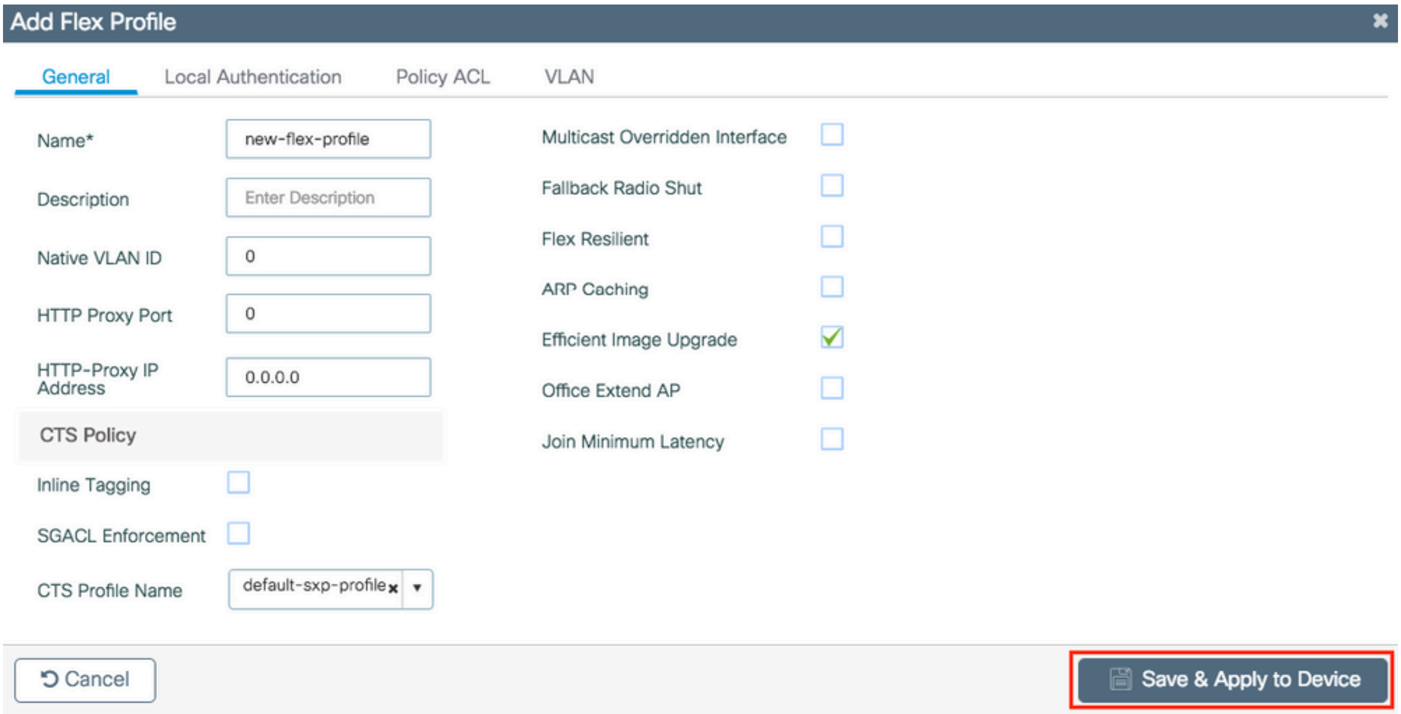


Flex Profile

	Flex Profile Name
□	default-flex-profile

1 | 10 items per page

Step 2. Modify the profile as desired. Once done, click **Save & Apply to Device**.



Name*	new-flex-profile
Description	Enter Description
Native VLAN ID	0
HTTP Proxy Port	0
HTTP-Proxy IP Address	0.0.0.0

CTS Policy

Inline Tagging	□
SGACL Enforcement	□
CTS Profile Name	default-sxp-profile

Multicast Overridden Interface	□
Fallback Radio Shut	□
Flex Resilient	□
ARP Caching	□
Efficient Image Upgrade	☑
Office Extend AP	□
Join Minimum Latency	□

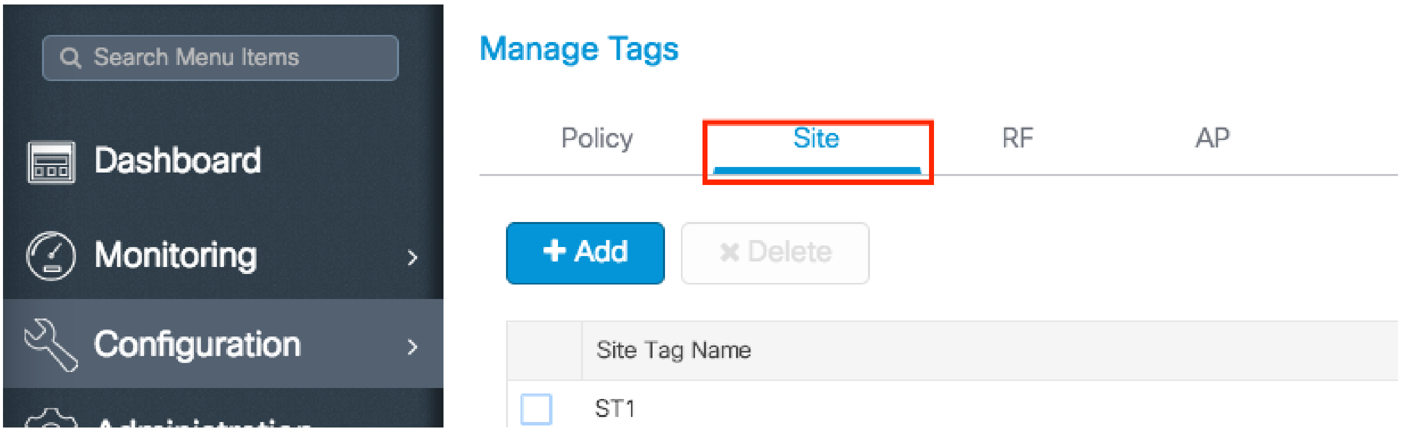
CLI:

```
# config t
# wireless profile flex <name-flex-profile>
# ------desired settings------
# end
```

Create/Modify a Site Tag

The Site tag is the setting that allows you to specify which AP join and/or Flex Profile is assigned to the APs.

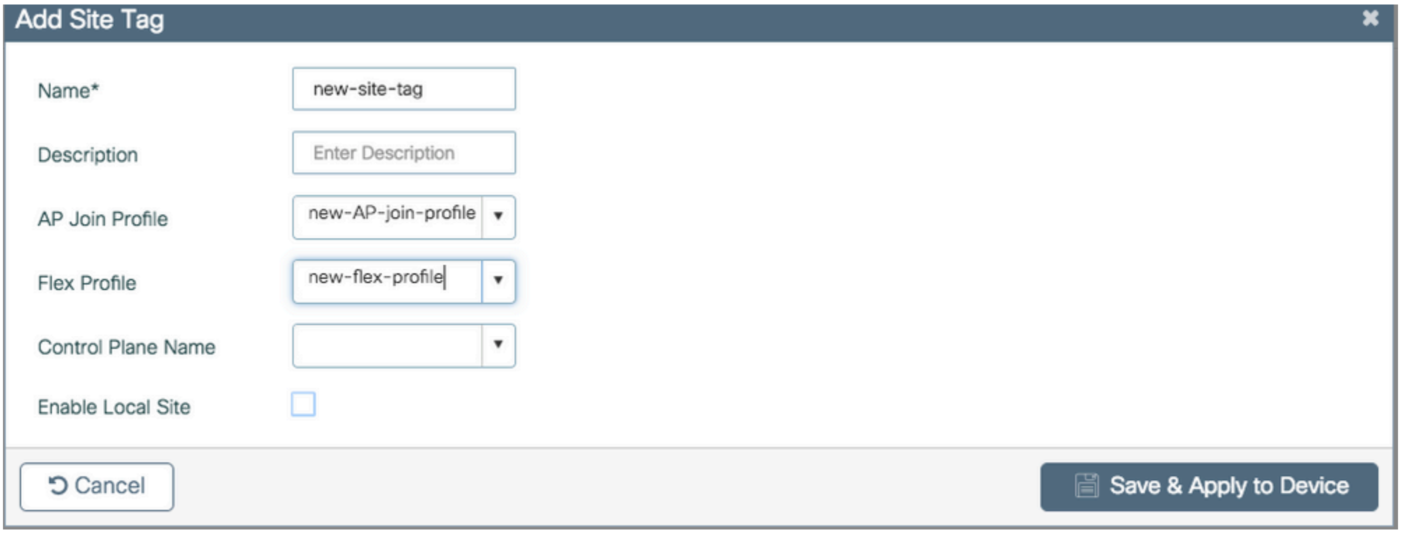
Step 1. Navigate to **Configuration** > **Tags & Profiles** > **Tags** > **Site**. Either select the name of an established one or click **+ Add** to add a new one.



Step 2. Inside the Site Tag, select the **AP Join Profile** that you want to add to the Site Tag.

If you whish to convert the APs the receive this tag into flexconnect mode disable **Enable Local Site** option.

Once it is disabled, you can also select a **Flex Profile**. After that, click **Save & Apply to Device**.


Add Site Tag

Name* new-site-tag

Description Enter Description

AP Join Profile new-AP-join-profile

Flex Profile new-flex-profile

Control Plane Name

Enable Local Site □

Remeber to keep Enable Local Site enabled if the APs are planned to be used in local mode.

CLI:

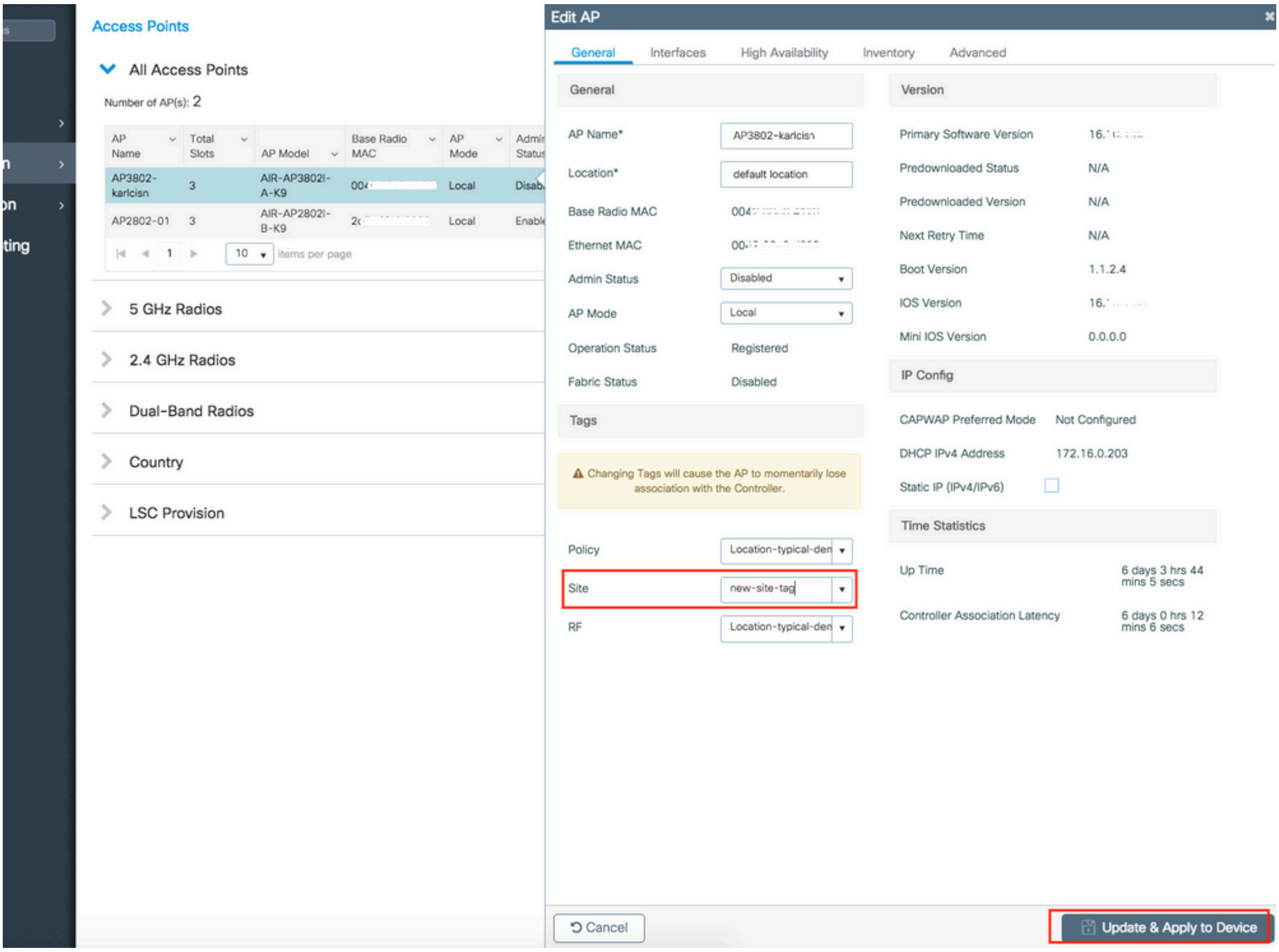
```
# config t
# wireless tag site <site-tag-name>
# ap-profile <AP-join-profile-name>
# flex-profile <flex-profile-name>
# [no] local-site
# end
```

Policy Tag Assignation

You can assign a Policy Tag directly to an AP or assign the same Policy Tag to a group of APs at the same time. Choose the one that fits you.

Policy Tag Assignation per AP

Navigate to **Configuration > Wireless > Access Points > AP name > General > Tags**. From the Site dropdown list, select the desired **Site Tag** and click **Update & Apply to Device**.



Access Points

All Access Points

Number of AP(s): 2

AP Name	Total Slots	AP Model	Base Radio MAC	AP Mode	Admin Status
AP3802-karlcisn	3	AIR-AP3802I-A-K9	[redacted]	Local	Disab
AP2802-01	3	AIR-AP2802I-B-K9	[redacted]	Local	Enable

1 | 10 items per page

5 GHz Radios

2.4 GHz Radios

Dual-Band Radios

Country

LSC Provision

Edit AP

General | Interfaces | High Availability | Inventory | Advanced

General

AP Name*	AP3802-karlcisn
Location*	default location
Base Radio MAC	[redacted]
Ethernet MAC	[redacted]
Admin Status	Disabled
AP Mode	Local
Operation Status	Registered
Fabric Status	Disabled

Tags

⚠ Changing Tags will cause the AP to momentarily lose association with the Controller.

Policy	Location-typical-den
Site	new-site-tag
RF	Location-typical-den

Version

Primary Software Version	[redacted]
Predownloaded Status	N/A
Predownloaded Version	N/A
Next Retry Time	N/A
Boot Version	1.1.2.4
IOS Version	[redacted]
Mini IOS Version	0.0.0.0

IP Config

CAPWAP Preferred Mode	Not Configured
DHCP IPv4 Address	172.16.0.203
Static IP (IPv4/IPv6)	□

Time Statistics

Up Time	6 days 3 hrs 44 mins 5 secs
Controller Association Latency	6 days 0 hrs 12 mins 6 secs

Note: Be aware that after change the policy tag on an AP, it loses its association to the 9800 WLCs and join back within about 1 minute.

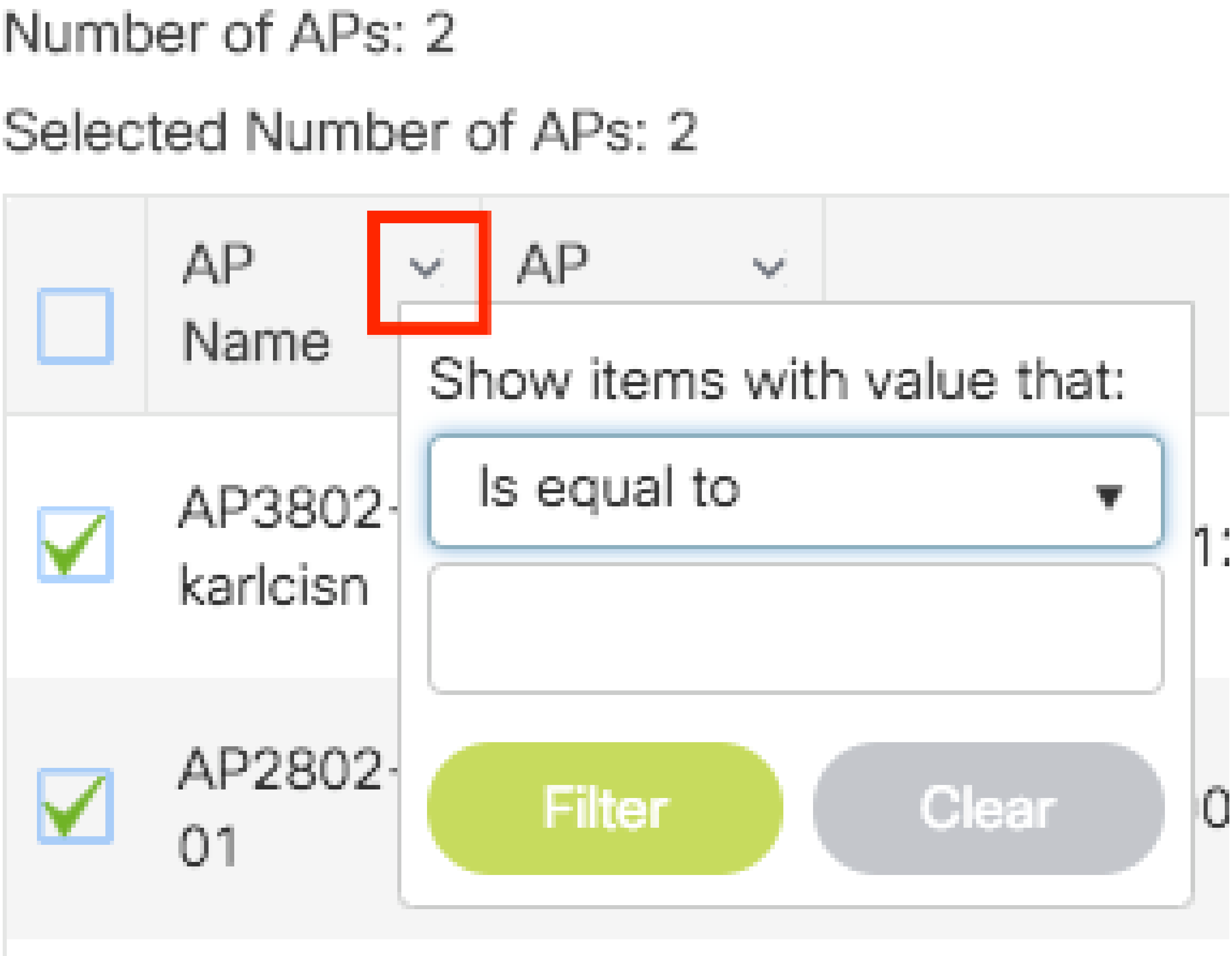
CLI:

```
# config t
# ap <ethernet-mac-addr>
# site-tag <site-tag-name>
# end
```

Policy Tag Assignation for Multiple APs

Navigate to **Configuration > Wireless Setup > Advanced > Start Now**.

Click on Tag APs **:= icon**. Select the list of APs that you want to assign the tags to (You can click on the point down arrow next to AP name [or any other field] to filter the list of APs).



Number of APs: 2

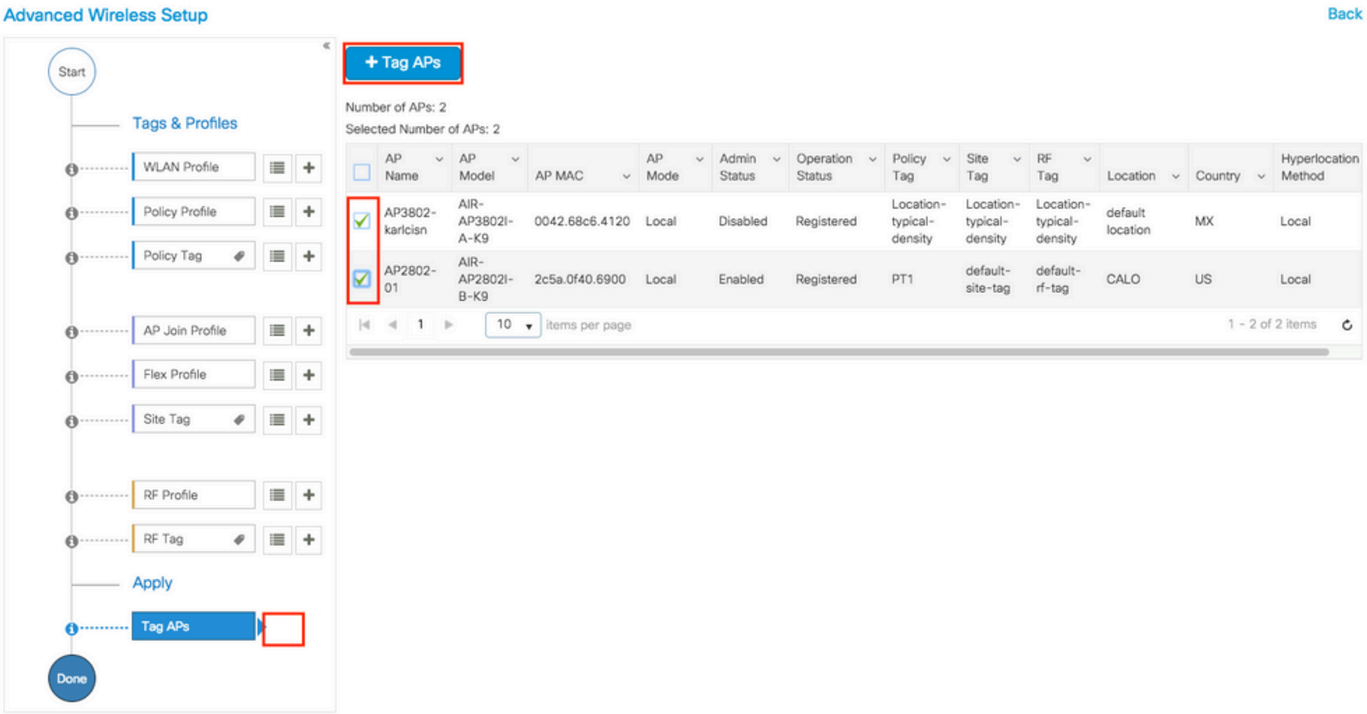
Selected Number of APs: 2

□	AP Name	AP
☑	AP3802-karlcisn	
☑	AP2802-01	

Show items with value that:

Is equal to ▼

Once you have selected the desired APs, click on **+ Tag APs**.



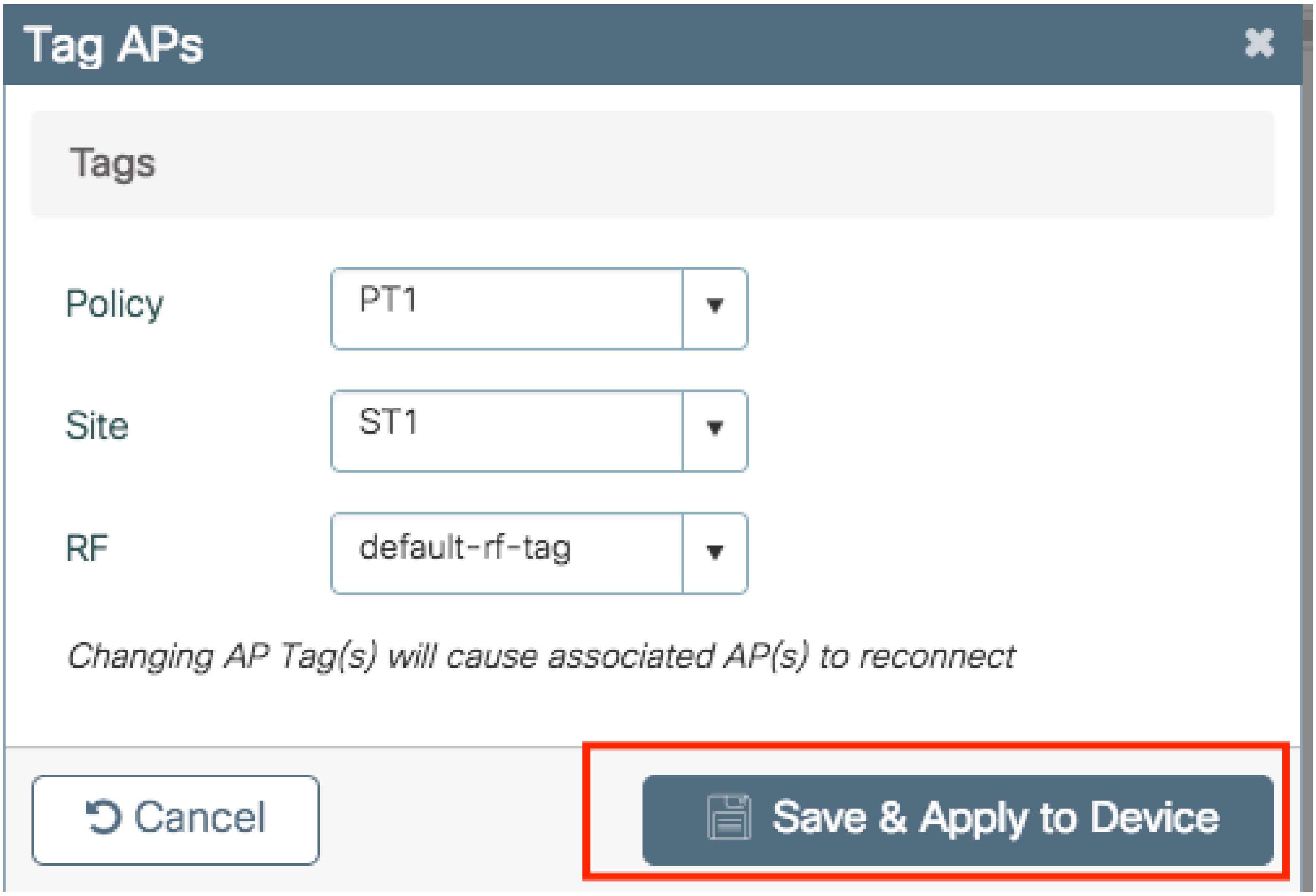
Advanced Wireless Setup

Number of APs: 2

Selected Number of APs: 2

□	AP Name	AP Model	AP MAC	AP Mode	Admin Status	Operation Status	Policy Tag	Site Tag	RF Tag	Location	Country	Hyperlocation Method
☑	AP3802-karlcisn	AIR-AP3802I-A-K9	0042.68c6.4120	Local	Disabled	Registered	Location-typical-density	Location-typical-density	Location-typical-density	default location	MX	Local
☑	AP2802-01	AIR-AP2802I-B-K9	2c5a.0f40.6900	Local	Enabled	Registered	PT1	default-site-tag	default-rf-tag	CALO	US	Local

Select the tags that you want to assign to the APs and click **Save & Apply to Device**.



Tag APs

Tags

Policy: PT1

Site: ST1

RF: default-rf-tag

Changing AP Tag(s) will cause associated AP(s) to reconnect

Note: Be aware that after change the policy tag on an AP, it loses its association to the 9800 WLCs and join back within about 1 minute.

CLI:

There is no CLI option to assign the same Tag to multiple APs.

RF Profiles on 9800 WLCs

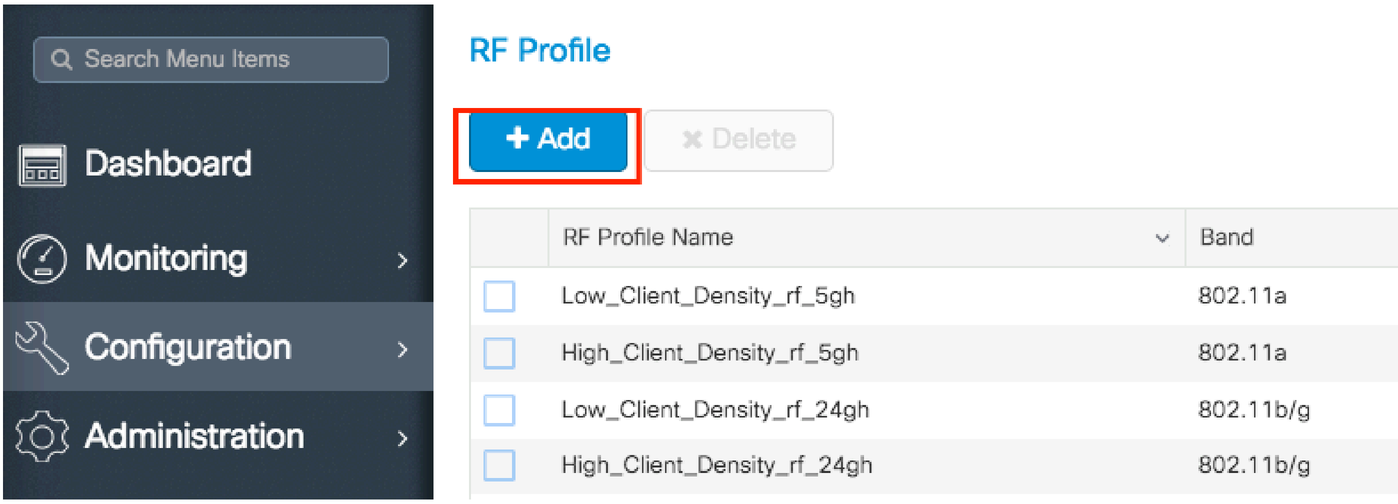
Recommended flow of configuration:

1. Create/Modify the RF profiles for 2.4GHz / 5GHz
2. Create/Modify a RF Tag
3. If needed, assign the RF Tag to the AP

Create/Modify the RF profiles for 2.4GHz / 5GHz

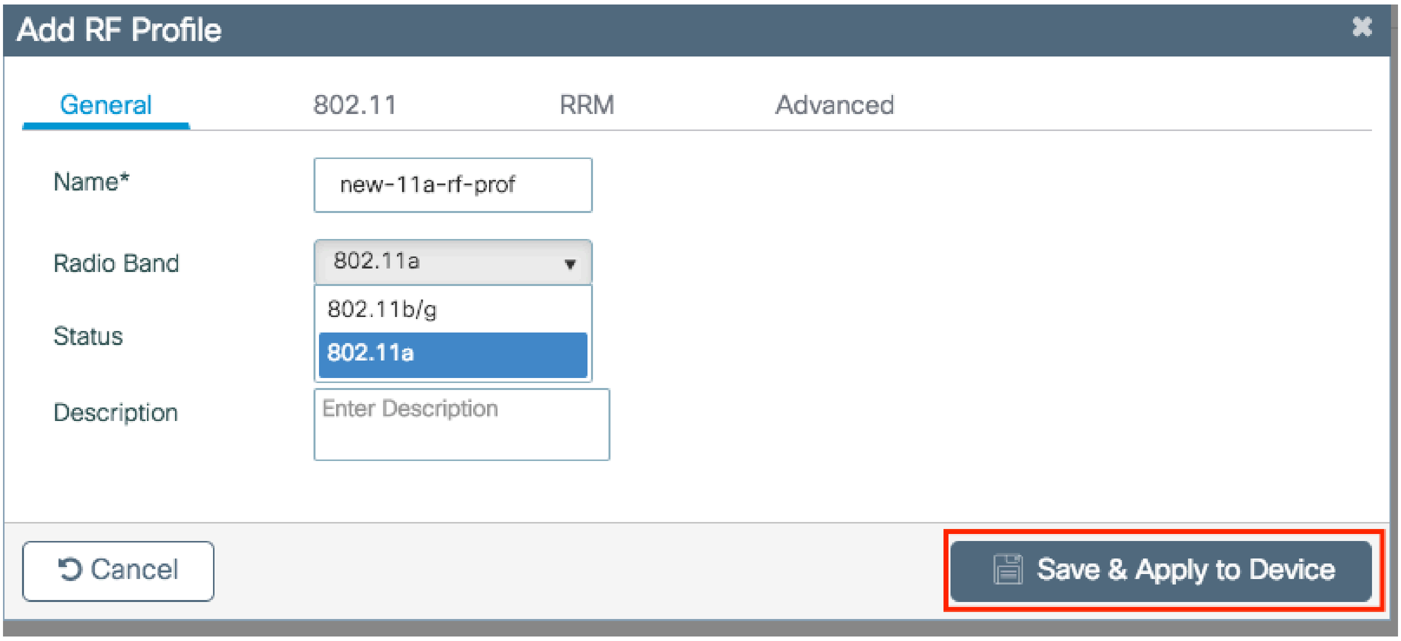
Step 1. Navigate to **Configuration > Tags & Profiles > RF**.

Either select the name of an established one or click **+ Add** to add a new one.



	RF Profile Name	Band
□	Low_Client_Density_rf_5gh	802.11a
□	High_Client_Density_rf_5gh	802.11a
□	Low_Client_Density_rf_24gh	802.11b/g
□	High_Client_Density_rf_24gh	802.11b/g

Step 2. Modify the profile as desired, one per band (802.11a/802.11b). Once done, click **Save & Apply to Device**.



Name* new-11a-rf-prof

Radio Band 802.11a

Status

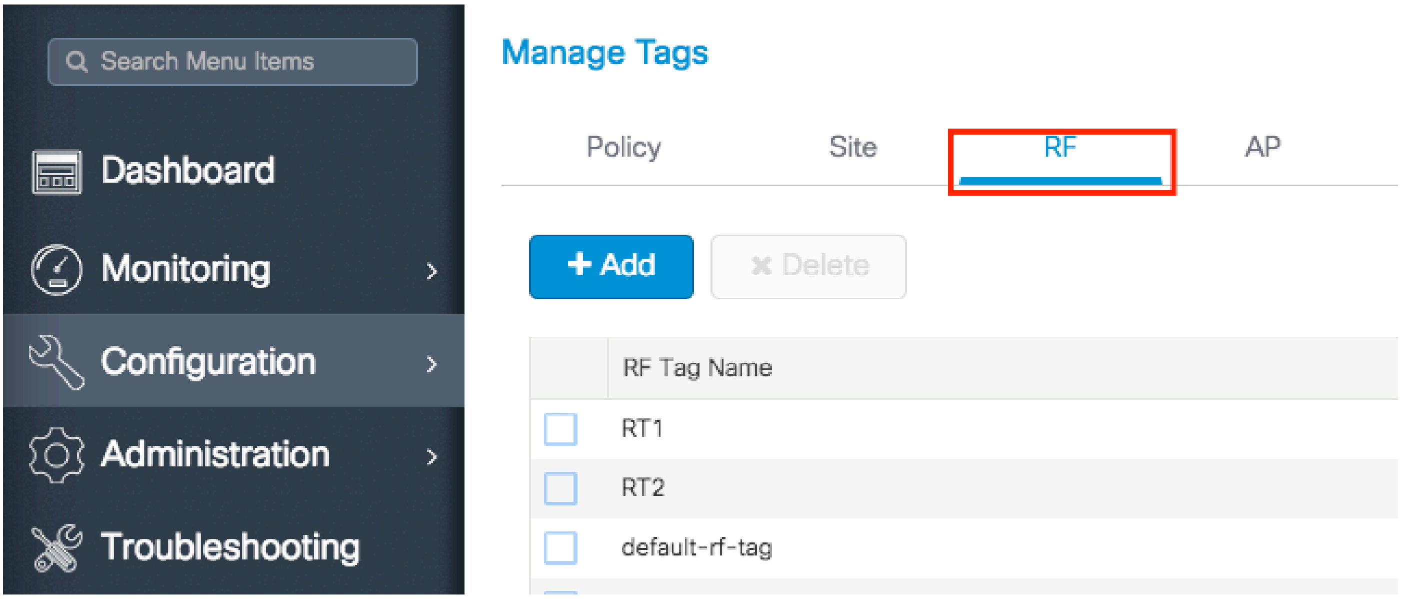
Description Enter Description

```
# config t
# ap dot11 { 5ghz | 24ghz} rf-profile <rf-profile-name>
# ------desired settings-----
# end
```

Create/Modify a RF Tag

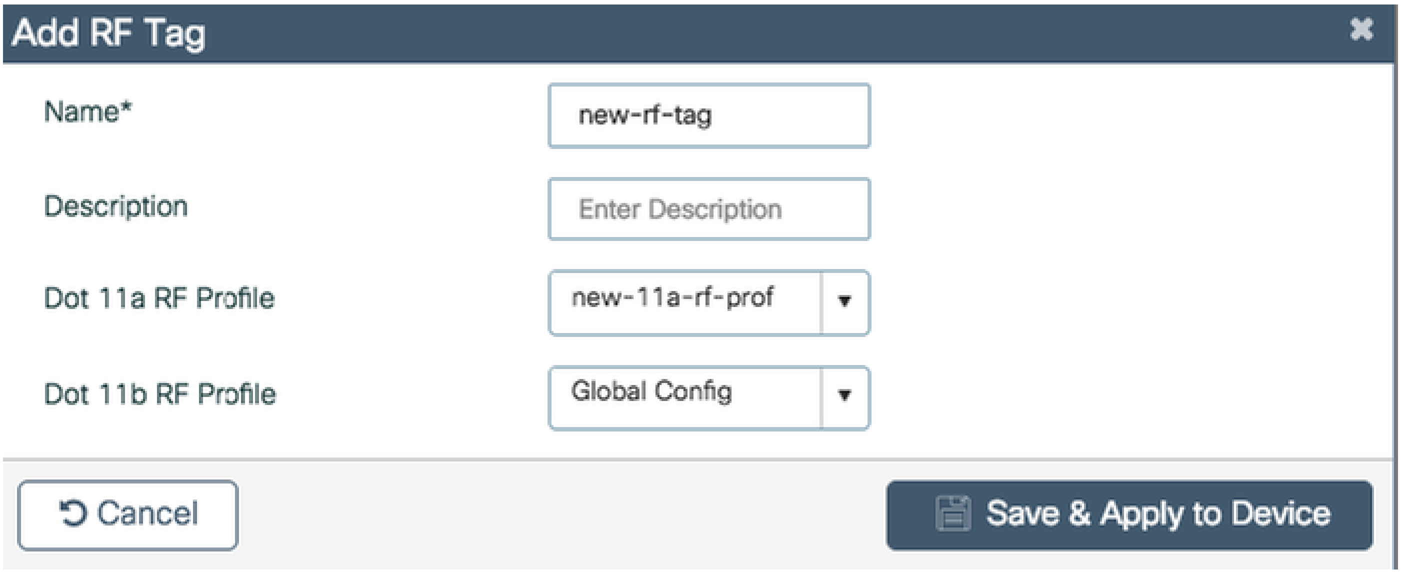
The RF tag is the setting that allows you to specify which RF Profiles are assigned to the APs.

Step 1. Navigate to **Configuration** > **Tags & Profiles** > **Tags** > **RF**. Either select the name of an established one or click **+ Add** to add a new one.



	RF Tag Name
□	RT1
□	RT2
□	default-rf-tag

Step 2. Inside the RF Tag, select the **RF Profile** that you want to add. Click **Save & Apply to Device**.



Name*	new-rf-tag
Description	Enter Description
Dot 11a RF Profile	new-11a-rf-prof
Dot 11b RF Profile	Global Config

CLI:

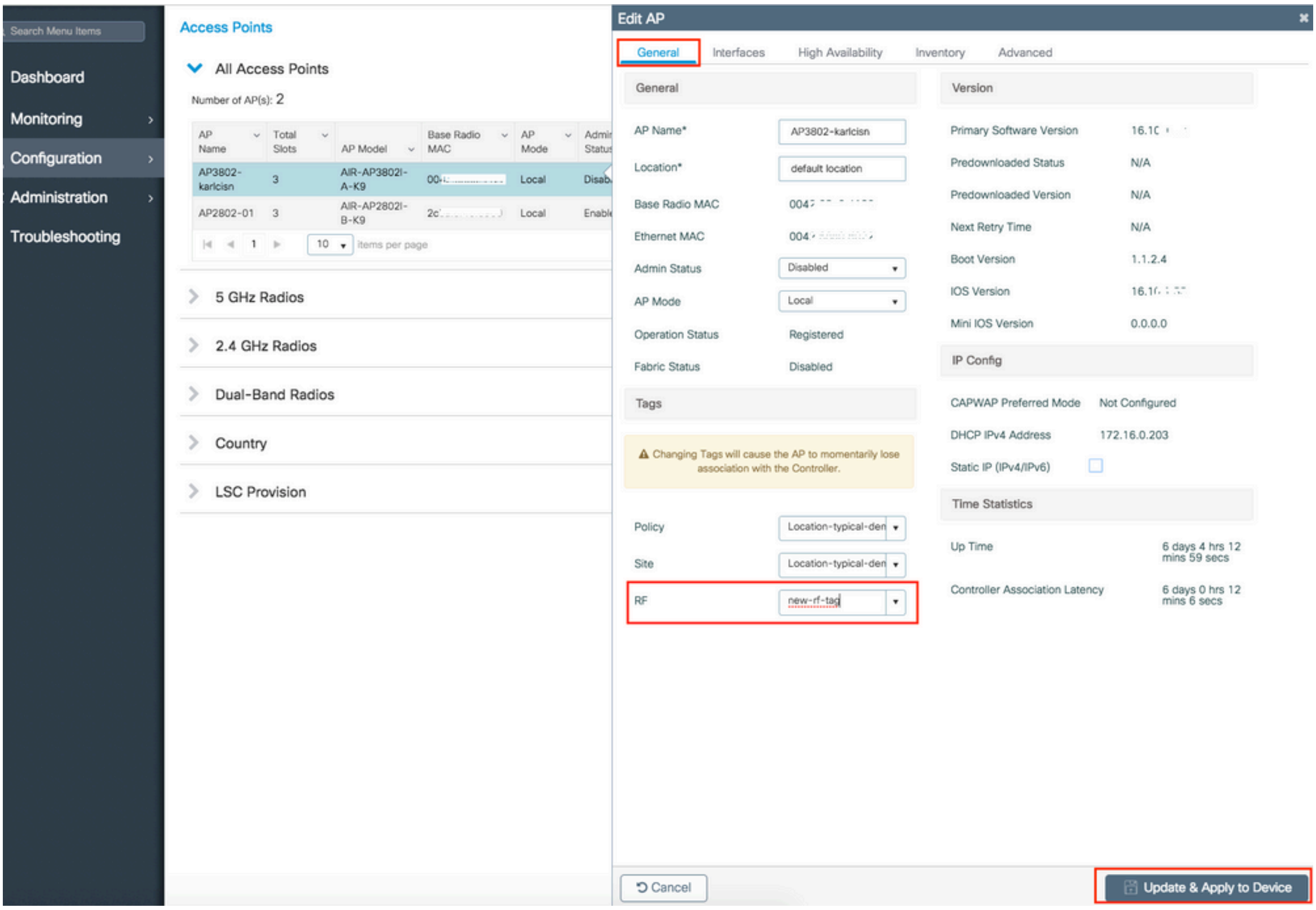
```
# config t
# wireless tag rf <rf-tag-name>
# 5ghz-rf-policy <11a-rf-prof>
# 24ghz-rf-policy <11b-rf-prof>
# end
```

Policy Tag Assignation

You can assign a RF Tag directly to an AP or assign the same RF Tag to a group of APs at the same time. Choose the one that fits you.

Policy Tag Assignation per AP

Navigate to **Configuration > Wireless > Access Points > AP name > General > Tags**. From the Site dropdown list, select the desired RF Tag and click **Update & Apply to Device**.



All Access Points

Number of AP(s): 2

AP Name	Total Slots	AP Model	Base Radio MAC	AP Mode	Admin Status
AP3802-karlcisn	3	AIR-AP3802I-A-K9	00[redacted]	Local	Disab
AP2802-01	3	AIR-AP2802I-B-K9	2c[redacted]	Local	Enable

10 items per page

General

AP Name*	AP3802-karlcisn
Location*	default location
Base Radio MAC	004[redacted]
Ethernet MAC	004[redacted]
Admin Status	Disabled
AP Mode	Local
Operation Status	Registered
Fabric Status	Disabled

Tags

⚠ Changing Tags will cause the AP to momentarily lose association with the Controller.

Policy	Location-typical-den
Site	Location-typical-den
RF	new-rf-tag

Version

Primary Software Version	16.1[redacted]
Predownloaded Status	N/A
Predownloaded Version	N/A
Next Retry Time	N/A
Boot Version	1.1.2.4
IOS Version	16.1[redacted]
Mini IOS Version	0.0.0.0

IP Config

CAPWAP Preferred Mode	Not Configured
DHCP IPv4 Address	172.16.0.203
Static IP (IPv4/IPv6)	□

Time Statistics

Up Time	6 days 4 hrs 12 mins 59 secs
Controller Association Latency	6 days 0 hrs 12 mins 6 secs

Note: Be aware that after change the policy tag on an AP, it loses its association to the 9800 WLCs and join back within about 1 minute.

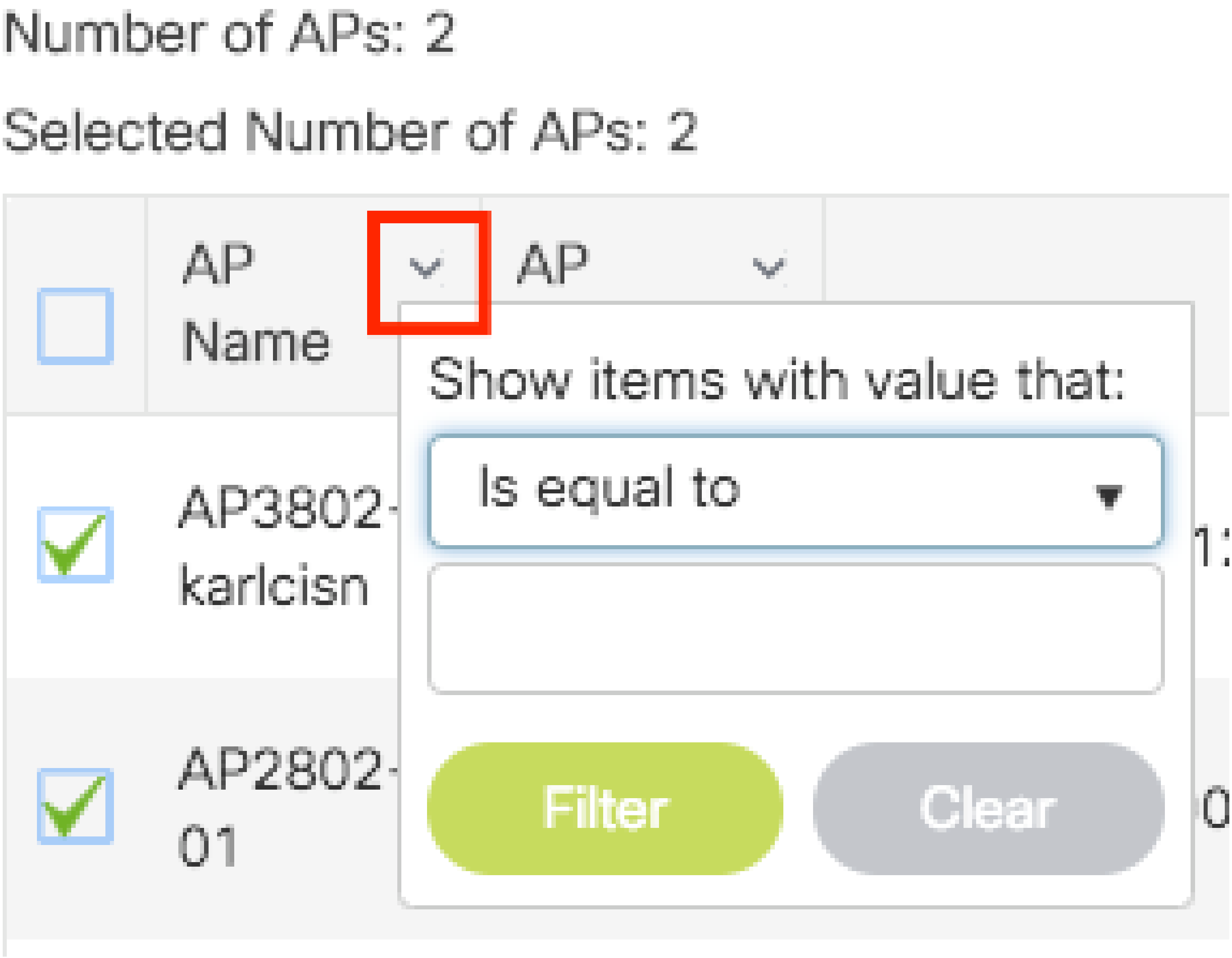
CLI:

```
# config t
# ap <ethernet-mac-addr>
# rf-tag <rf-tag-name>
# end
```

Policy Tag Assignation for Multiple APs

Navigate to **Configuration > Wireless Setup > Advanced > Start Now**.

Click on Tag APs **:= icon**. Select the list of APs that you want to assign the tags to (You can click on the point down arrow next to AP name [or any other field] to filter the list of APs).



Number of APs: 2

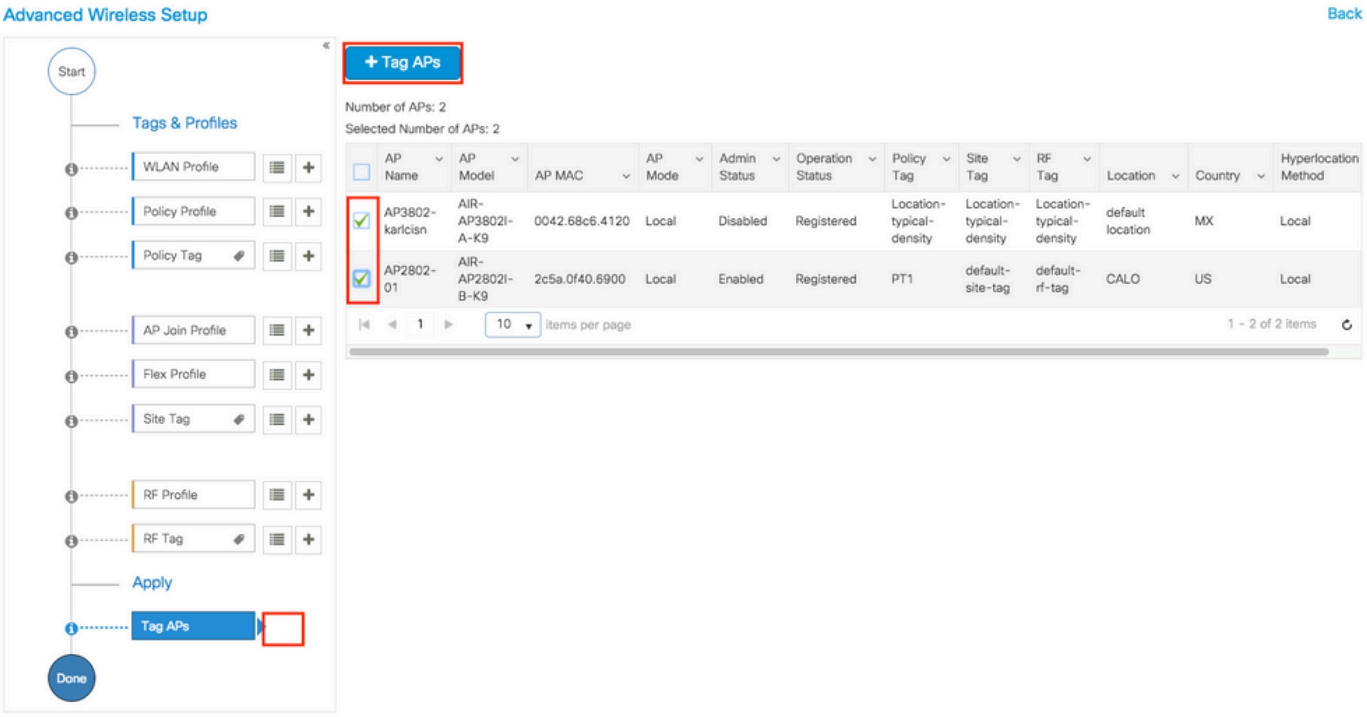
Selected Number of APs: 2

□	AP Name	AP
☑	AP3802-karlcisn	
☑	AP2802-01	

Show items with value that:

Is equal to

Once you have selected the desired APs, click on **+ Tag APs**.



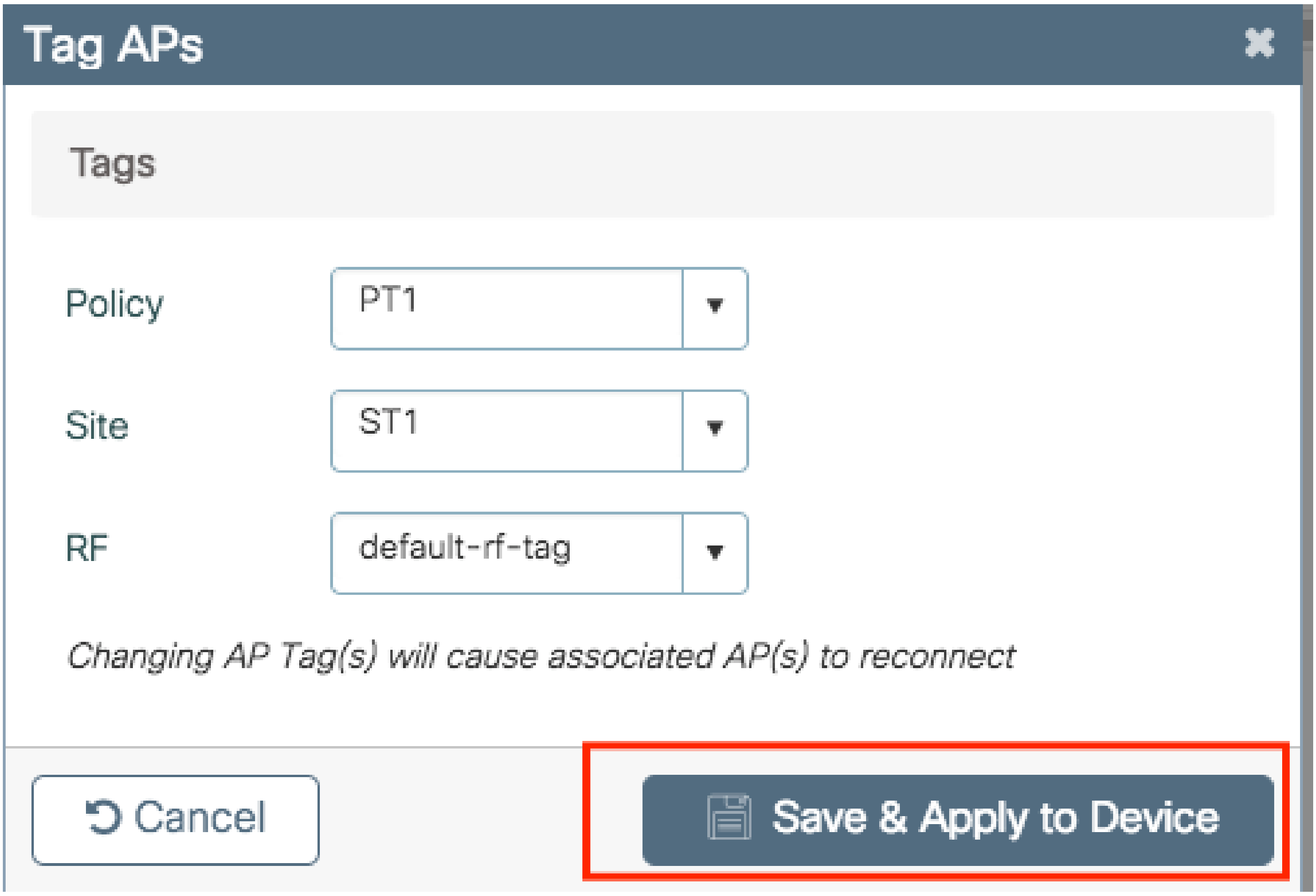
Number of APs: 2

Selected Number of APs: 2

□	AP Name	AP Model	AP MAC	AP Mode	Admin Status	Operation Status	Policy Tag	Site Tag	RF Tag	Location	Country	Hyperlocation Method
☑	AP3802-karlcisn	AIR-AP3802I-A-K9	0042.68c6.4120	Local	Disabled	Registered	Location-typical-density	Location-typical-density	Location-typical-density	default location	MX	Local
☑	AP2802-01	AIR-AP2802I-B-K9	2c5a.0f40.6900	Local	Enabled	Registered	PT1	default-site-tag	default-rf-tag	CALO	US	Local

1 | 10 items per page | 1 - 2 of 2 items

Select the tags that you want to assign to the APs and click **Save & Apply to Device**.



Tag APs

Tags

Policy: PT1

Site: ST1

RF: default-rf-tag

Changing AP Tag(s) will cause associated AP(s) to reconnect

Note: Be aware that after change the policy tag on an AP, it loses its association to the 9800 WLCs and join back within about 1 minute.

CLI:

There is no CLI option to assign the same Tag to multiple APs.

Verification

You can use these commands to verify the configuration.

VLANs/Interfaces Configuration

```
# show vlan brief
# show interfaces trunk
# show run interface <interface-id>
```

AAA Configuration

```
# show run aaa
# show aaa servers
```

WLAN Configuration

```
# show wlan summary
# show run wlan [wlan-name]
# show wlan { id <wlan-id> | name <wlan-name> | all }
```

AP Configuration

```
# show ap summary
# show ap tag summary
# show ap name <ap-name> tag { info | detail }
```

```
# show ap name <ap-name> tag detail

AP Name            : AP2802-01
AP Mac             : 0896.ad9d.143e

Tag Type             Tag Name
-----------------------------
Policy Tag           PT1
RF Tag               default-rf-tag
Site Tag             default-site-tag

Policy tag mapping
------------------
WLAN Profile Name                Policy Name                      VLAN                             Cent
--------------------------------------------------------------------------------------------------------
psk-pbl-ewlc                     ctrl-vl2602                      VLAN0210                         ENAB

Site tag mapping
----------------
Flex Profile         : default-flex-profile
AP Profile           : default-ap-profile
Local-site           : Yes

RF tag mapping
--------------
5ghz RF Policy       : Global Config
2.4ghz RF Policy     : Global Config
```

Tag Configuration

```
# show wireless tag { policy | rf | site } summary
# show wireless tag { policy | rf | site } detailed <tag-name>
```

Profile Configuration

```
# show wireless profile { flex | policy } summary
# show wireless profile { flex | policy } detailed <profile-name>
# show ap profile <AP-join-profile-name> detailed
```

FAQs

1. Can I use the same Policy Profile for different SSIDs?

R= Yes

2. Can I use the same SSID on different Policy Tags?

R= Yes

3. Can I use the same Policy Profile on different Policy Tags?

R= Yes

4. What is maximum number of SSIDs that can be inside a Policy Tag?

R= 16

5. Do I need to modify the three tags on the AP?

R= No, you could create one new tag and assign it to the AP(s) and use the default tags for the rest of the settings, or leave the other two Tags unchanged.