Configure Mesh APs for Local Data Bridging in Flex and Bridge Mode

Contents

Introduction

This document describes the configuration of MAPs in Flex and Bridge mode for local client data bridging, bypassing the RAP.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Catalyst Wireless 9800 configuration model
- Configuration of LAPs
- Control And Provision of Wireless Access Points (CAPWAP)
- Configuration of Cisco switches

Components Used

This example utilizes lightweight access points (9124AP models), which can be configured as either a Root

Access Point (RAP) or a Mesh Access Point (MAP) to seamlessly integrate with the Catalyst 9800 Wireless LAN Controller (WLC).

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

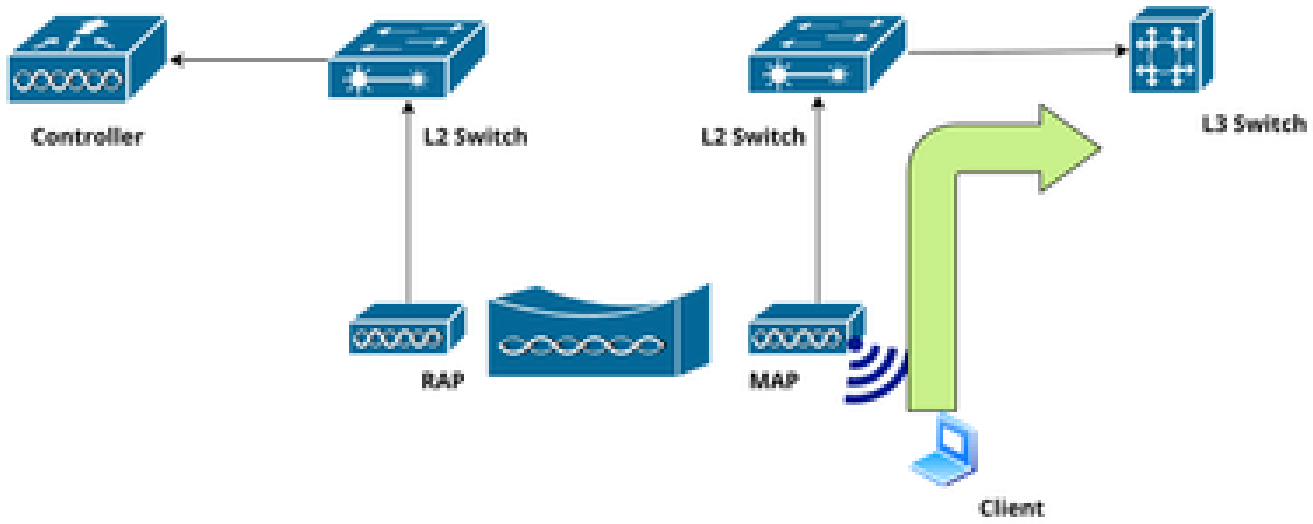
- C9800-L v17.12.5
- Cisco Catalyst 3850 Switch
- Cisco Catalyst 9124AX Series Access Point

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.

Configure

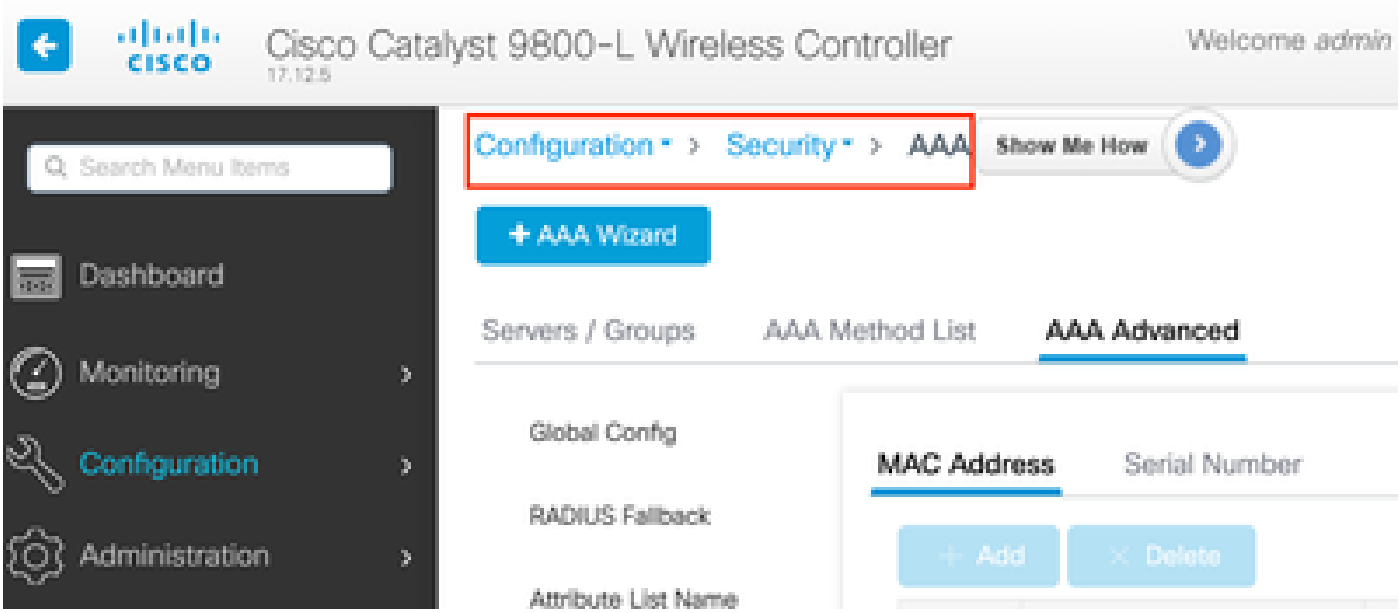
This section outlines configuration of Mesh Access Points (MAPs) operating in Mesh + Bridge mode, allowing local client data to be bridged directly to the uplink switch, bypassing the Root Access Point (RAP).

Network Diagram

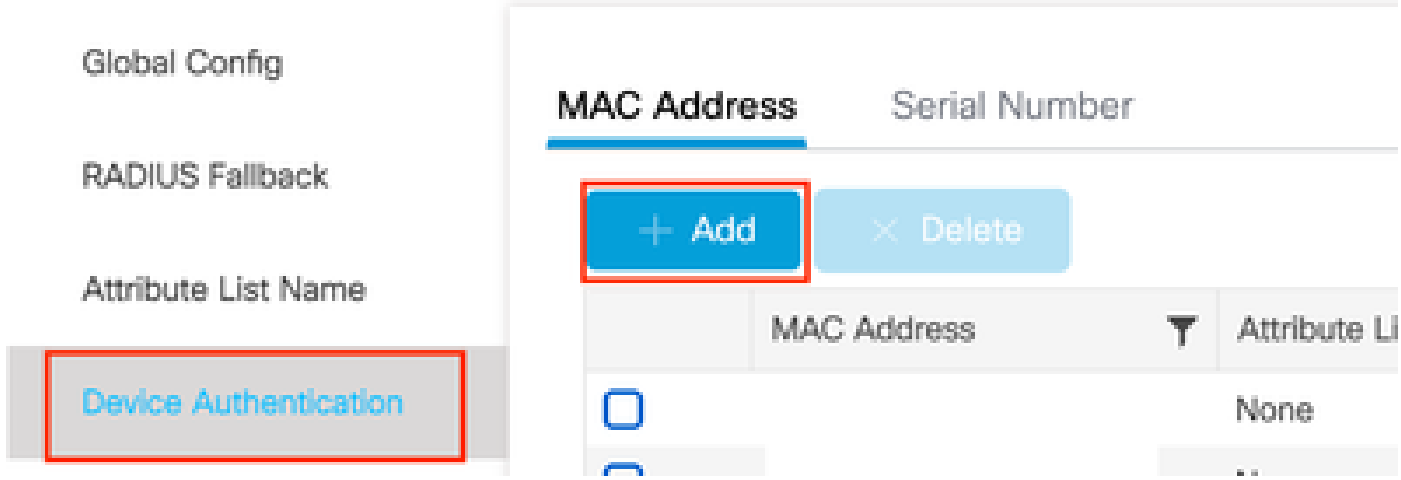


Add Access Point to Controller Local Database

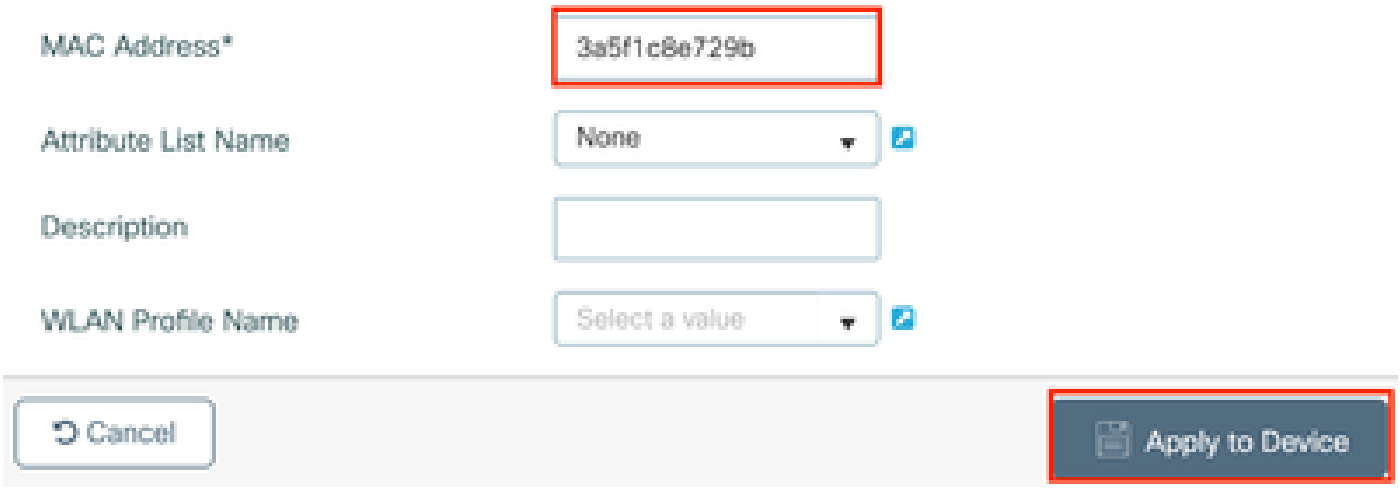
Step 1**:** Navigate to **Configuration > Security > AAA > AAA Advanced**.



Step 2. Select**Device Authentication**and select**Add**.

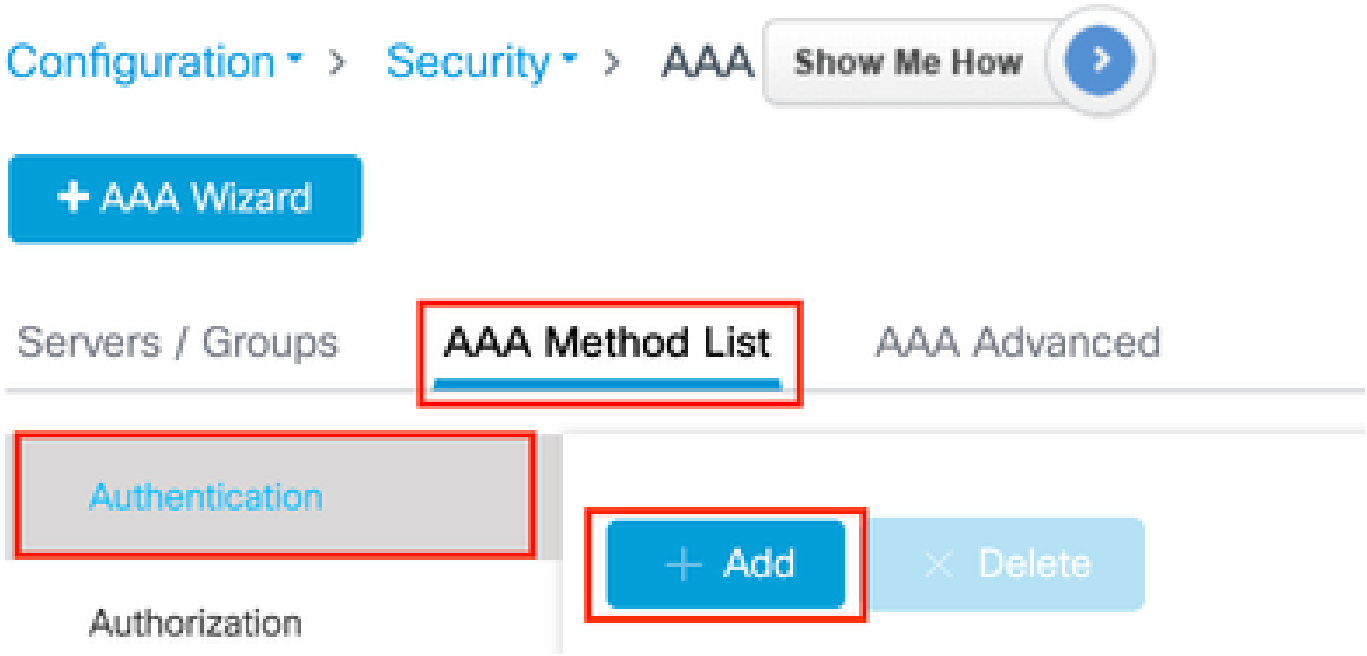


Step 3. Type in the**Base Ethernet MAC address**of the AP to join the WLC. Leave the**Attribute List Name**blank, and select**Apply to Device**.

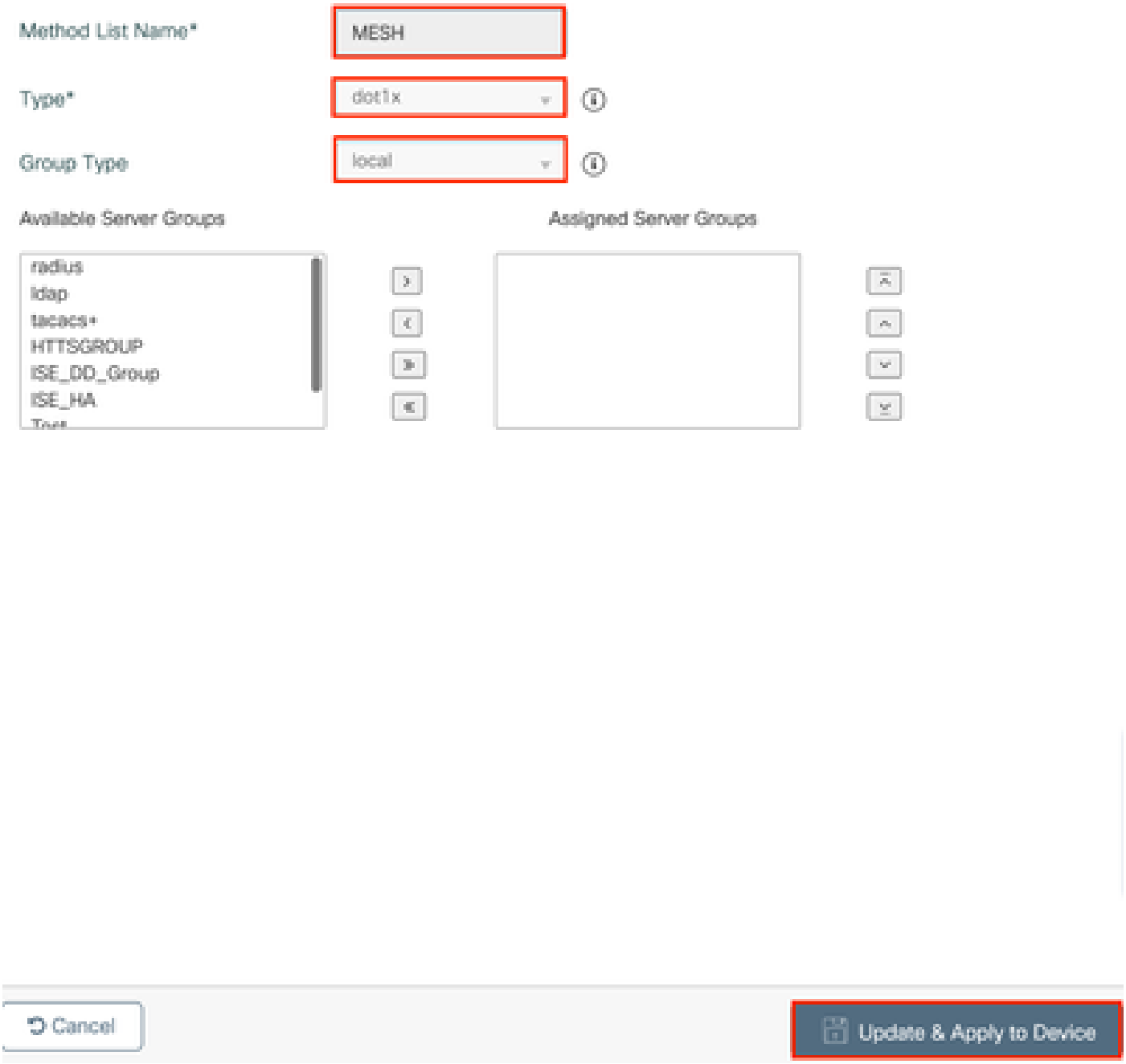


AAA Method List for Authentication

Step 1: Navigate to **Configuration > Security > AAA > AAA Method List >Authentication and** select **Add.**

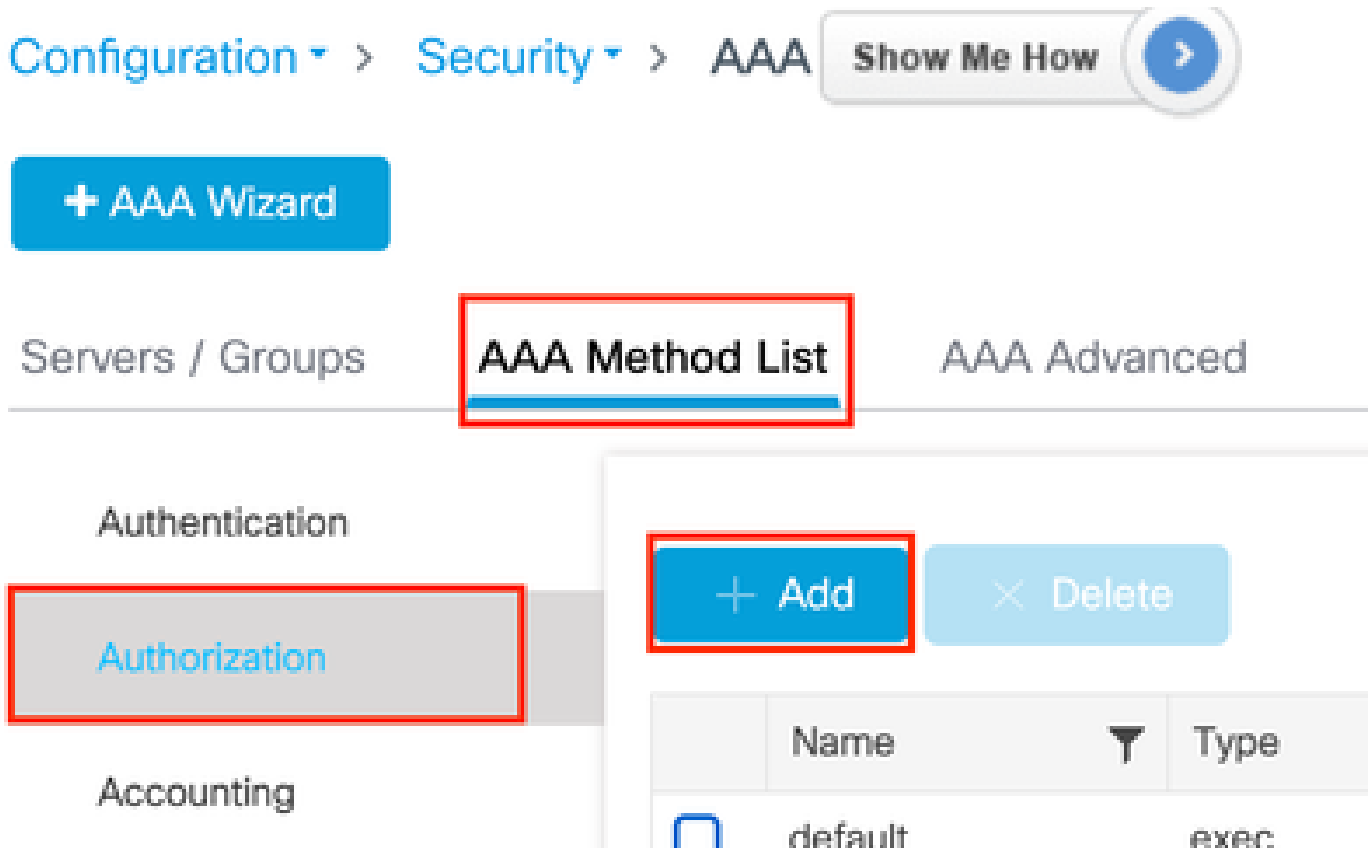


Step 2**:** Define Method List Name. Select **dot1x** from the **Type*** drop-down and **local** for the **Group Type**. Select **Apply to Device** to save the configuration.

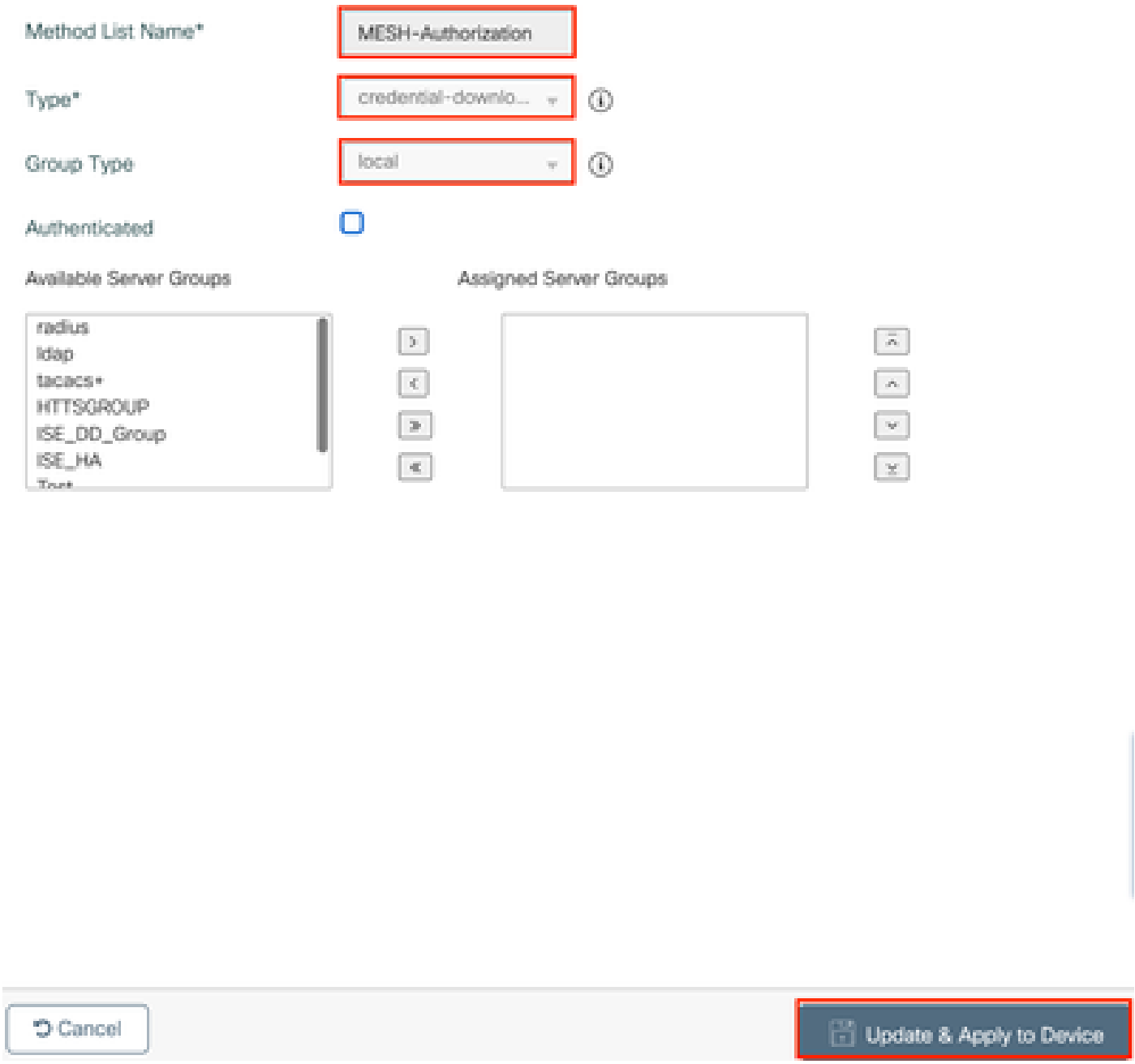


AAA Method List for Authorization

Step 1: Navigate to **Configuration > Security > AAA > AAA Method List > Authorization** and select **Add**.

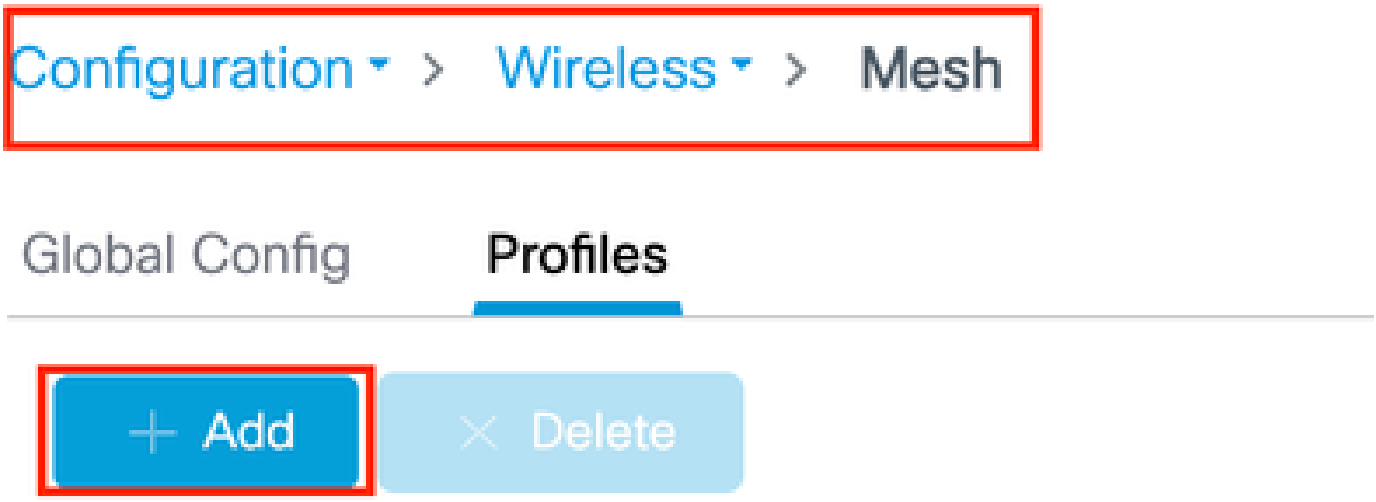


Step 2: Define **Method List Name**, select **credential download** from the **Type*** dropdown and **local** for the **Group Type**. Click **Apply to Device**.

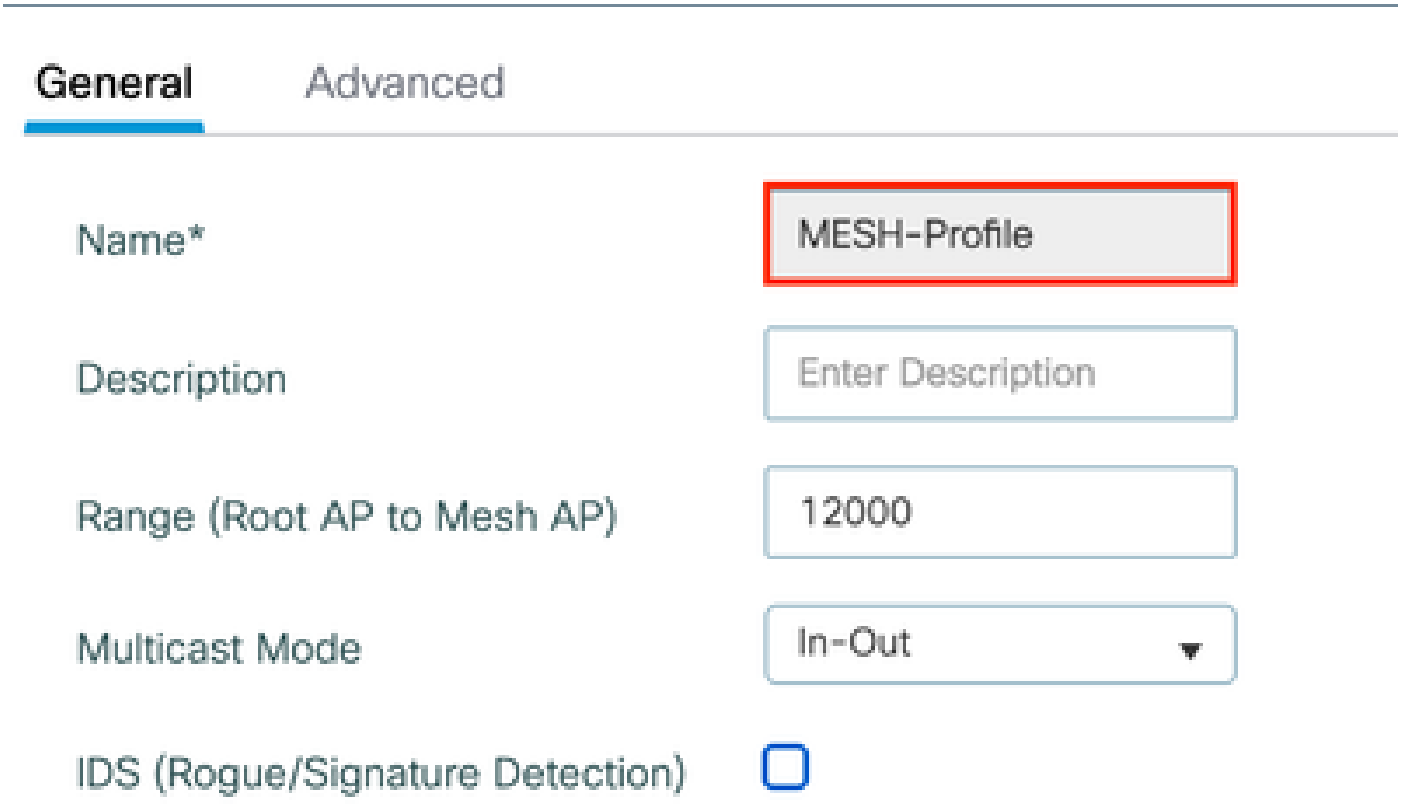


Mesh Profile

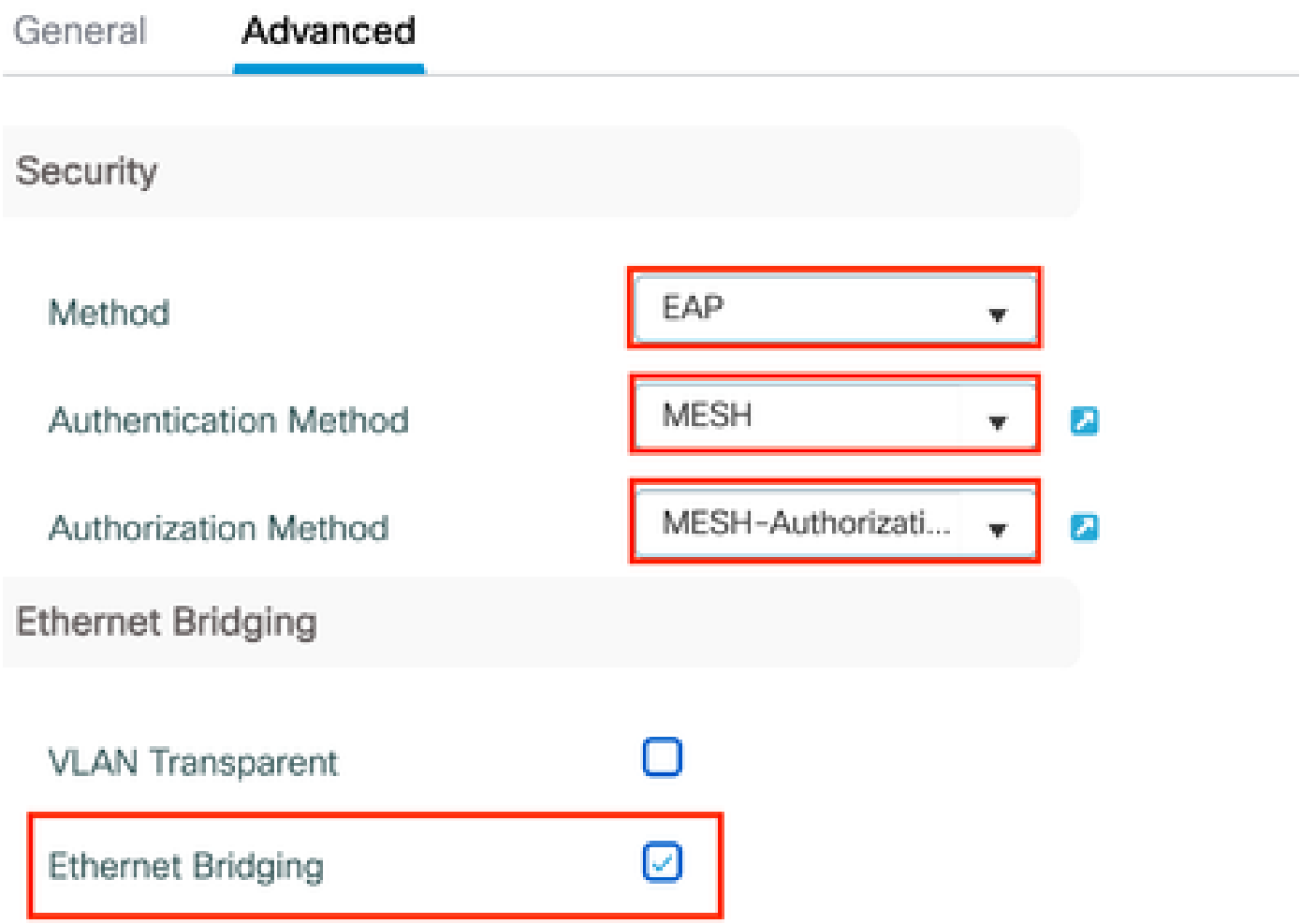
Step 1: Navigate to **Configuration > Wireless > Mesh >Profiles and** select **Add.**



Step 2: Under the **General** tab, define a name and description (optional) for the **Mesh profile**.

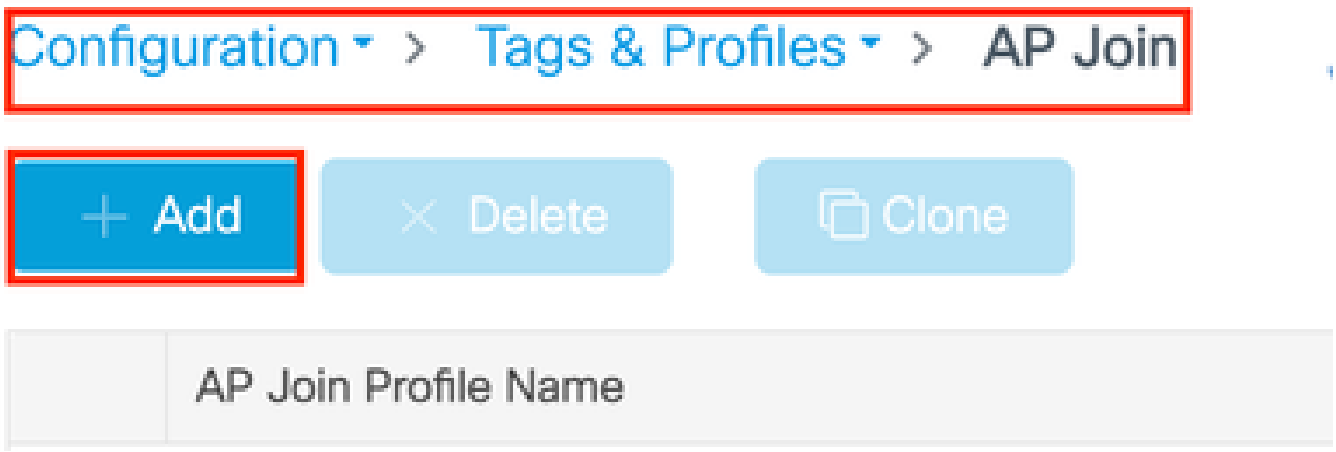


Step 3: In the **Advanced** tab, set the **Method** field to **EAP**, then select the previously created **Authorization** and **Authentication** profiles from the dropdown menus. Finally, enable the **Ethernet Bridging** checkbox and select Update and apply.

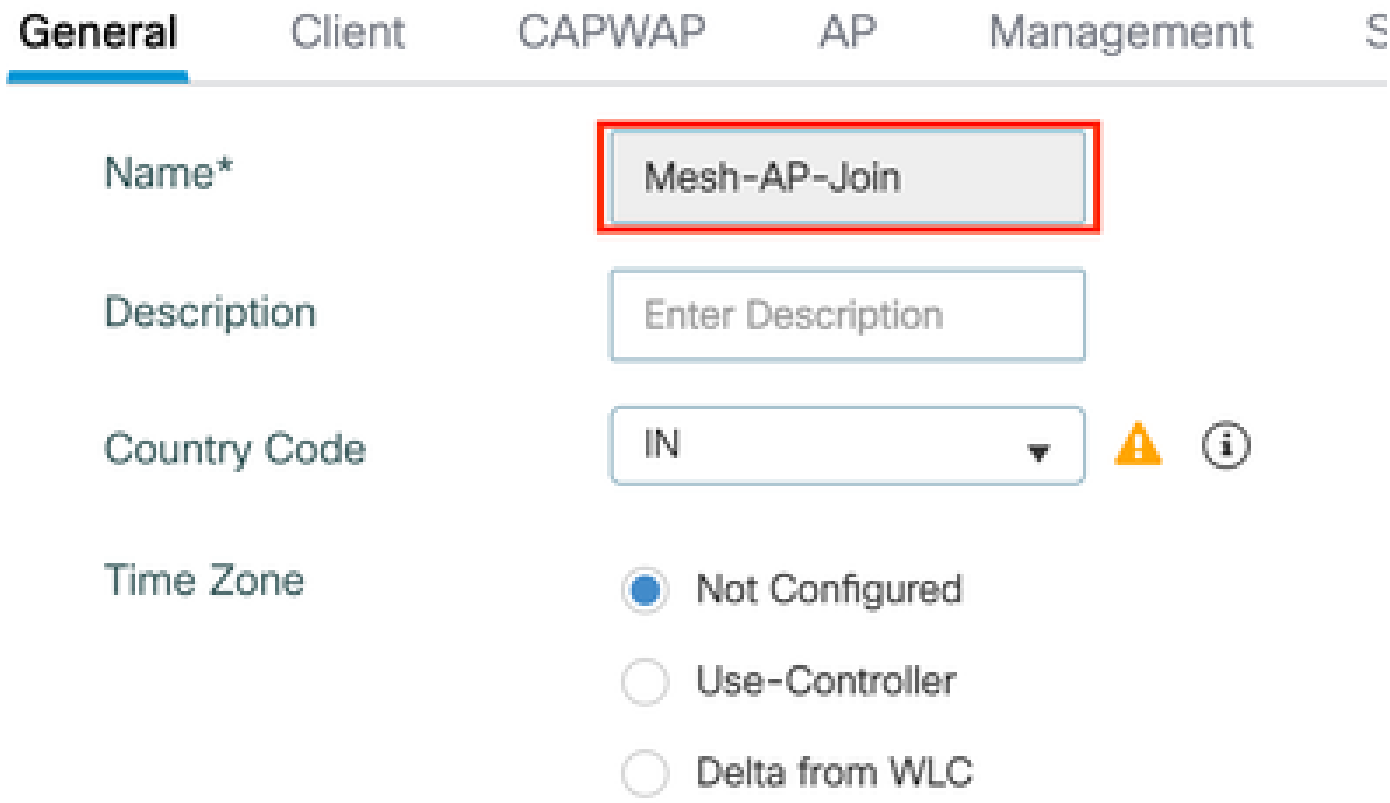


AP Join Profile

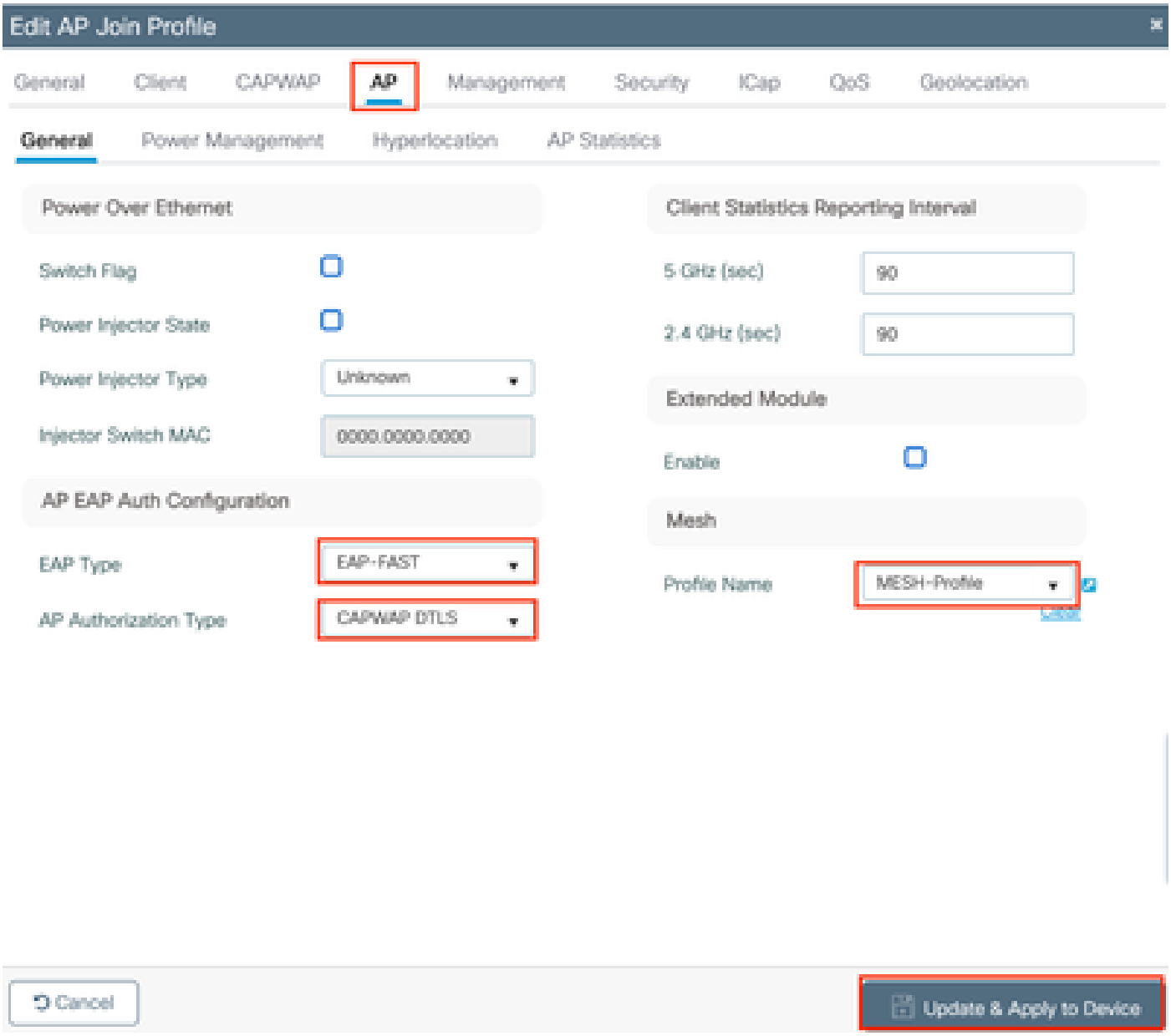
Step 1: Navigate to **Configuration > Tag & Profiles > AP Join > Profile**, click **Add.**



Step 2: Define profile **name** and description (optional).

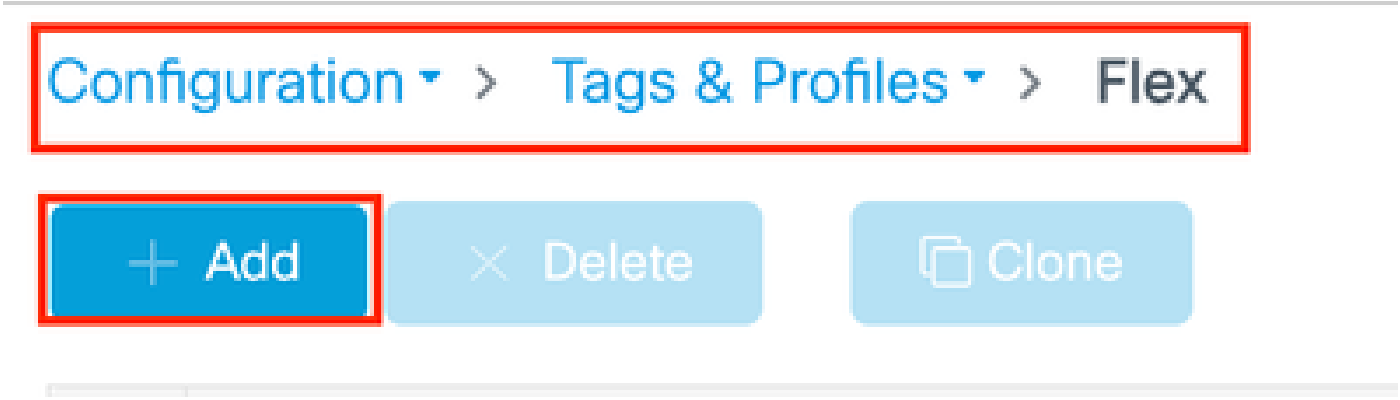


Step 3: Navigate to the **AP tab**, select the **Mesh Profile** from the **Mesh Profile Name** dropdown, set **EAP-FAST** for the **EAP Type** and **CAPWAP DTLS** for the **AP Authorization Type**, and click **Apply to Device**.

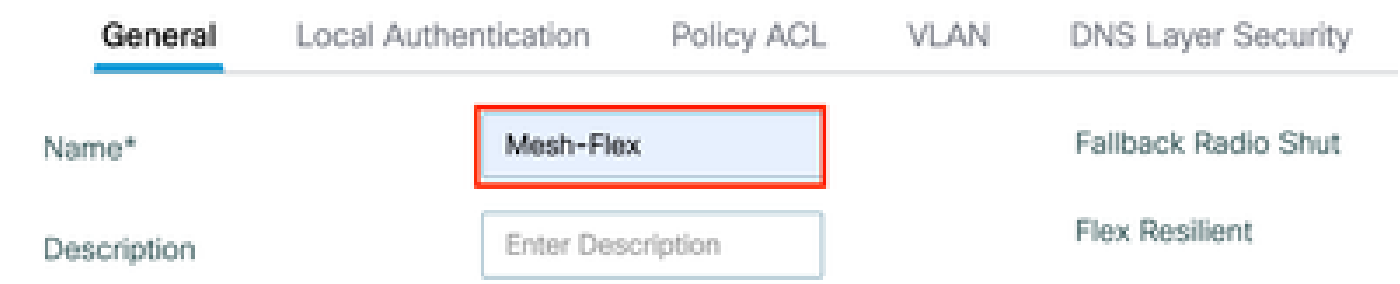


Flex Profile

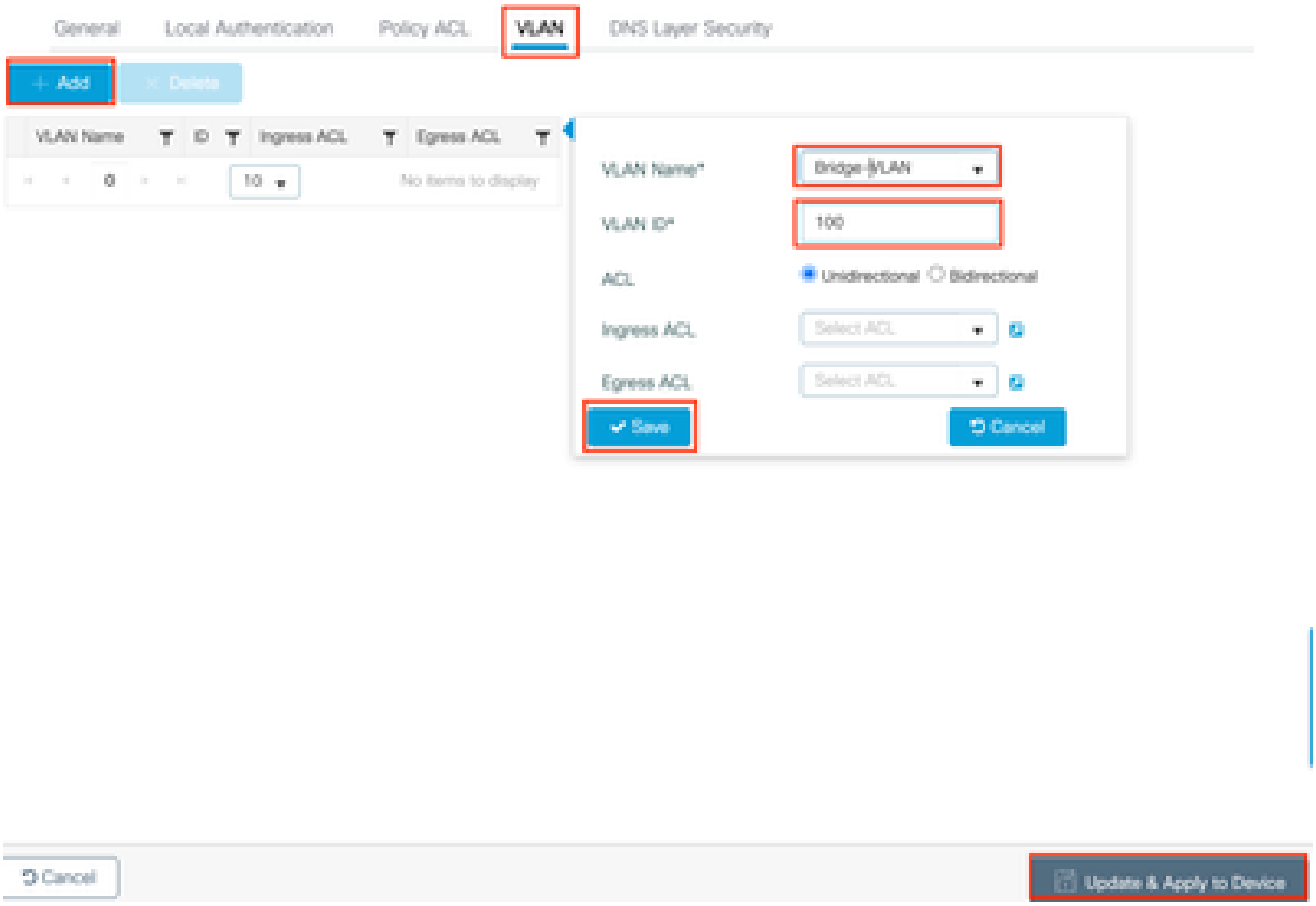
Step 1: **Configuration > Tags & Profiles > Flex**, then click **Add.**



Step 2: Define a **name** for Flex profile.

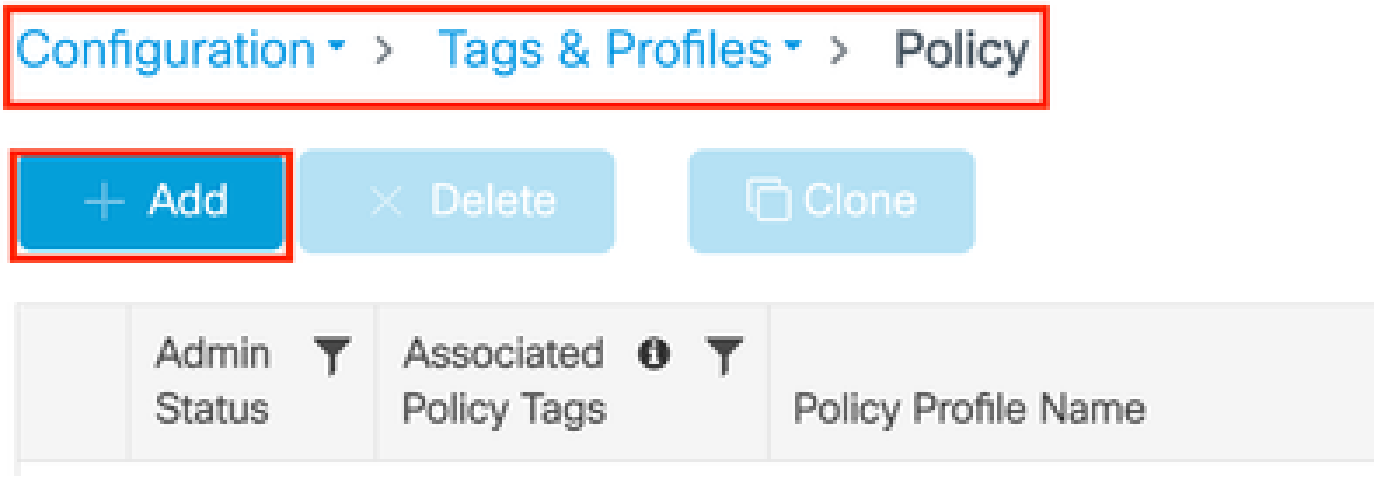


Step 3: Navigate to the **vlan** tab and Configure the **VLAN Name** and **VLAN ID** for Local Bridging of Wireless Client Traffic, click **Save.**

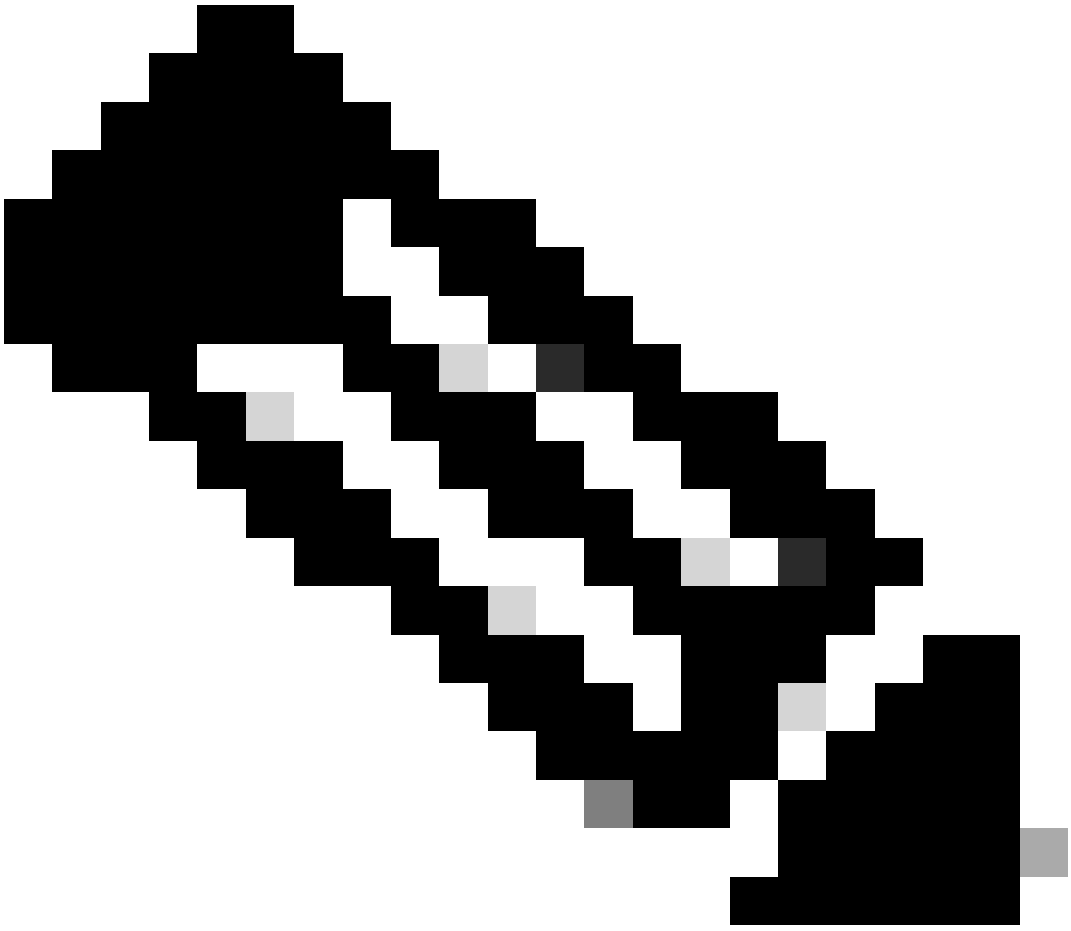


Policy Profile

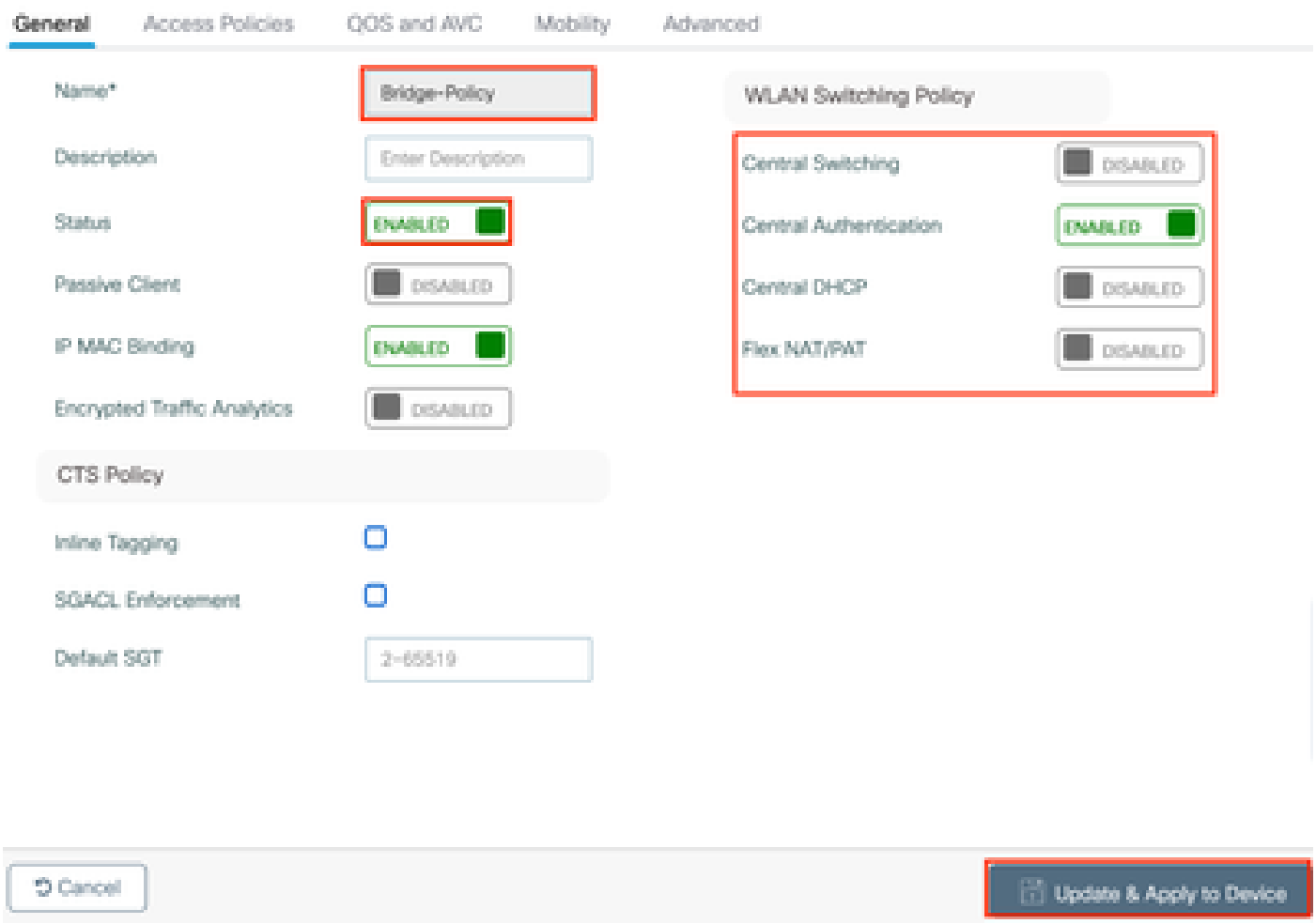
Step 1: Navigate to **Configuration > Tags & Profiles > Policy** and click **Add.**



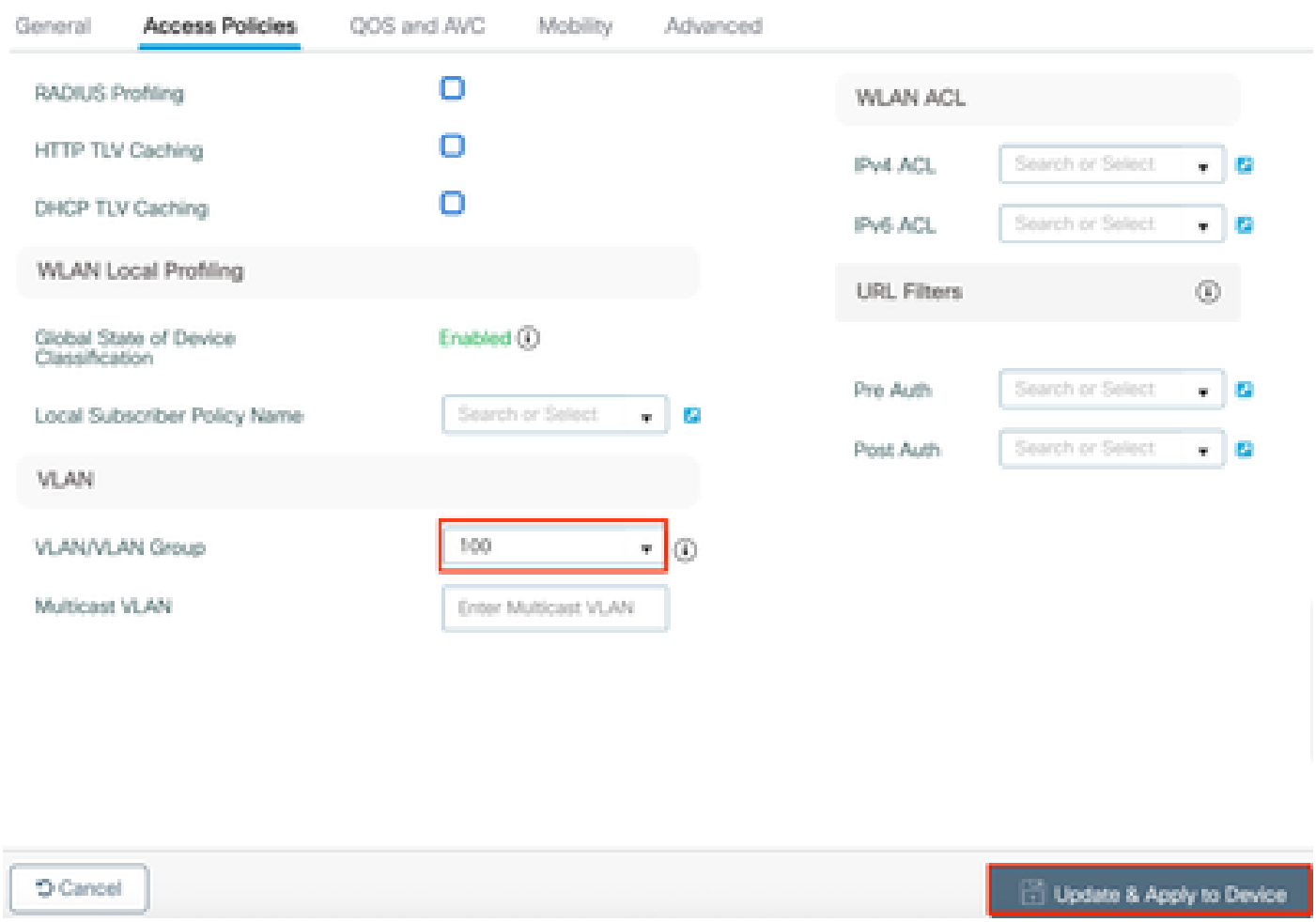
Step 2: Under the **General** tab, define the porifle **name**, set **Status** to **Enabled**, and **Disable Central Switching.**



Note: To enable local bridging of client traffic, **Central Switching** must be disabled. Based on the SSID configuration, other options can be enabled or disabled as needed.



Step 3: Configure the **VLANID** specified under the VLAN tab of the AP Flex Profile, and click **Update & Apply.**

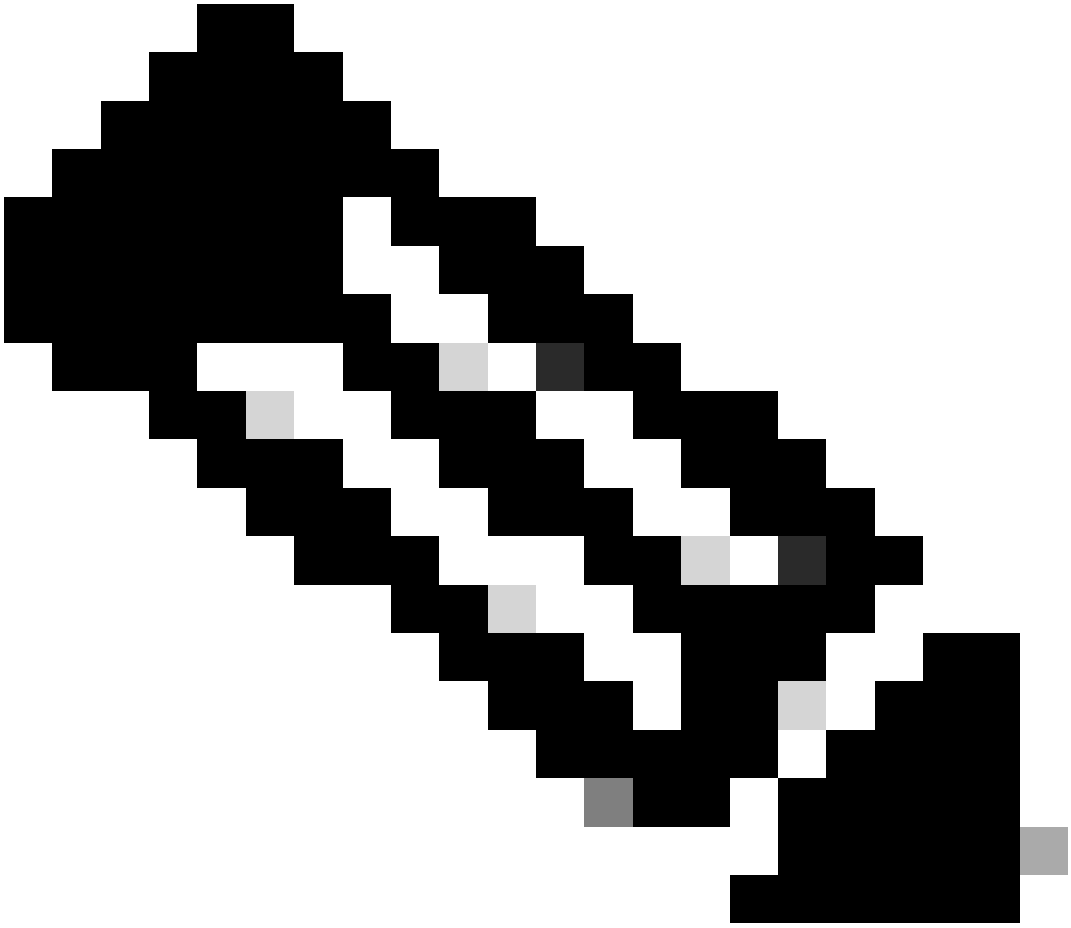


WLAN Tag

Step 1: Navigate to **Configuration > Tags & Profiles > WLANs** and select **Add.**

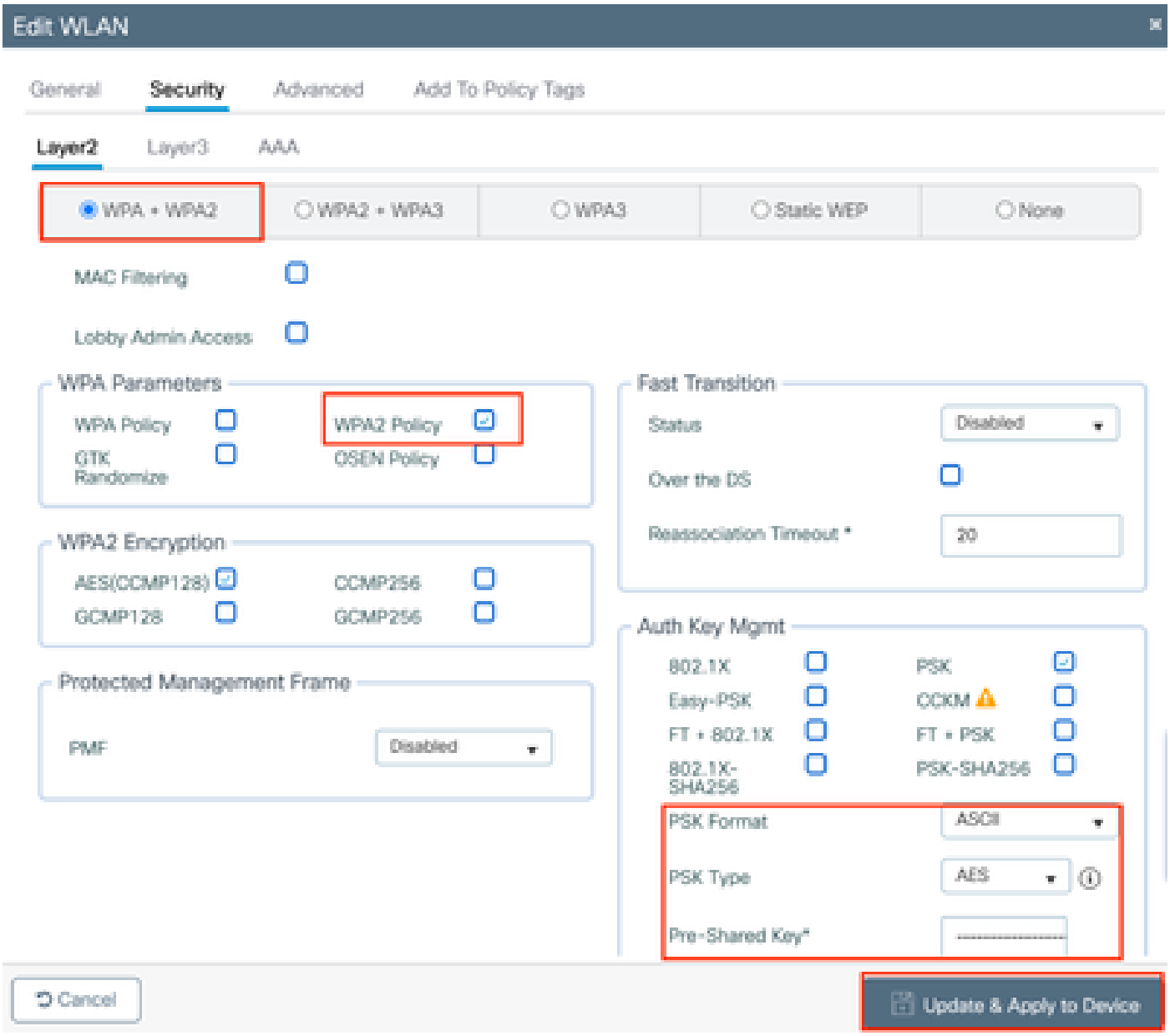
Step 2: Under the **General** Tab, Configure the **Profile name**, **SSID** and set the status to **enabled.**

Step 3: Select the Security Tab, Enable **WAP+WPA2** and configure a **Pre-shared key.**



Note: SSID configuration depends entirely on your requirements. For this example, a PSK-based SSID is configured.

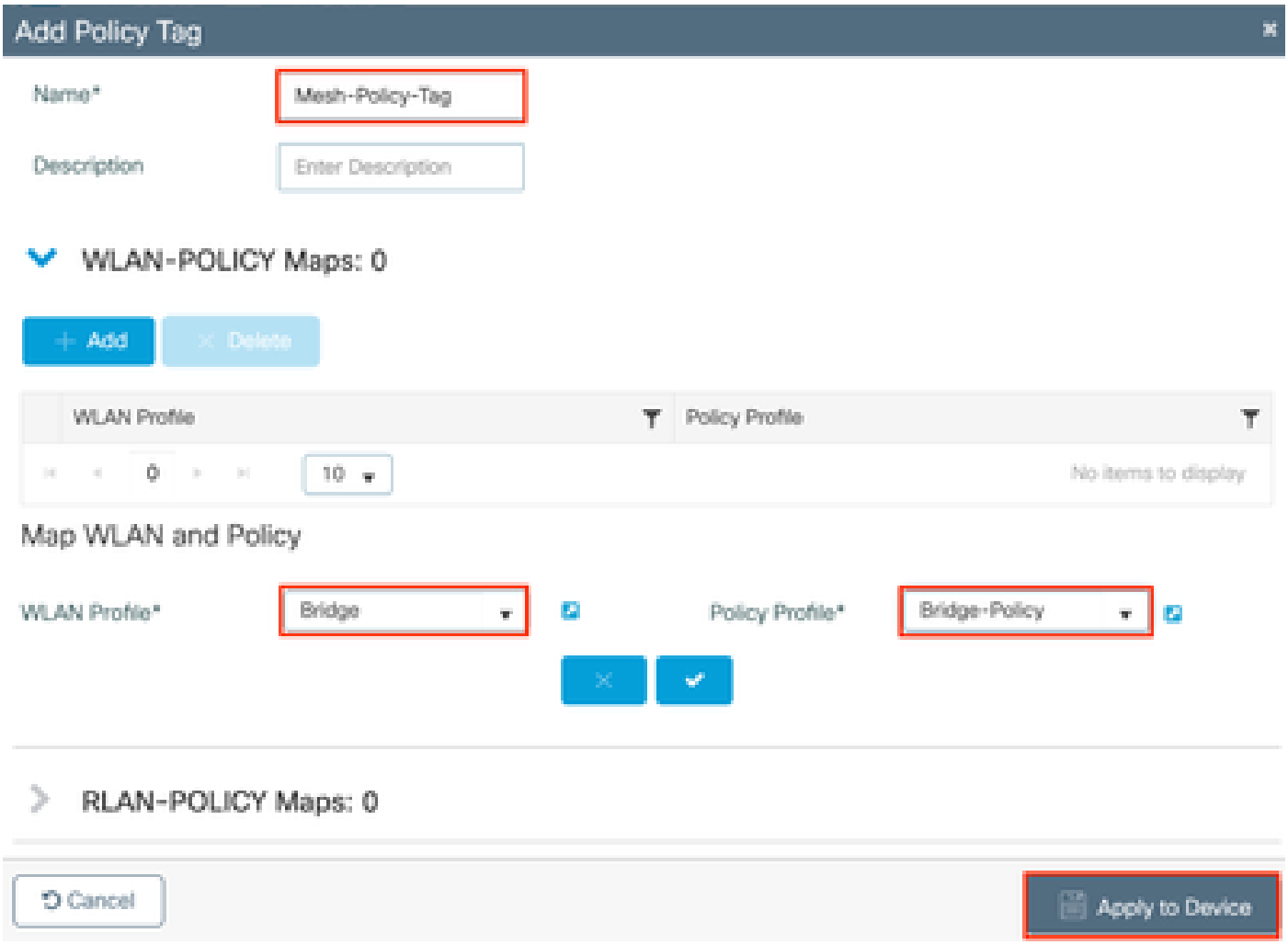

General
Security
Advanced
Add To Policy Tags
Profile Name*
Bridge
SSID*
Bridge-SSID
WLAN ID*
6
Status
ENABLED
Broadcast SSID
ENABLED



Policy Tag

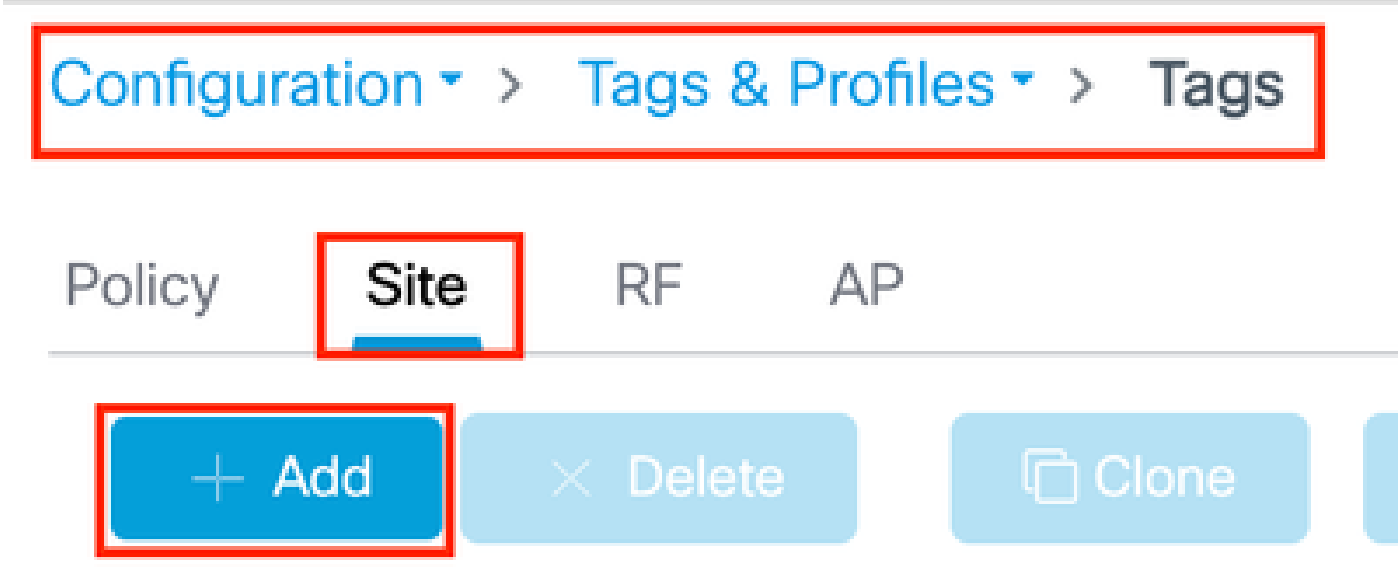
Step 1: Navigate to **Configuration** > **Tags & Profiles** > **Tags** > **Policy** Tab, click **Add.**

Step 2: Create a Policy Tag by defining a **name** and associating the **WLAN** and **Policy Profile.**

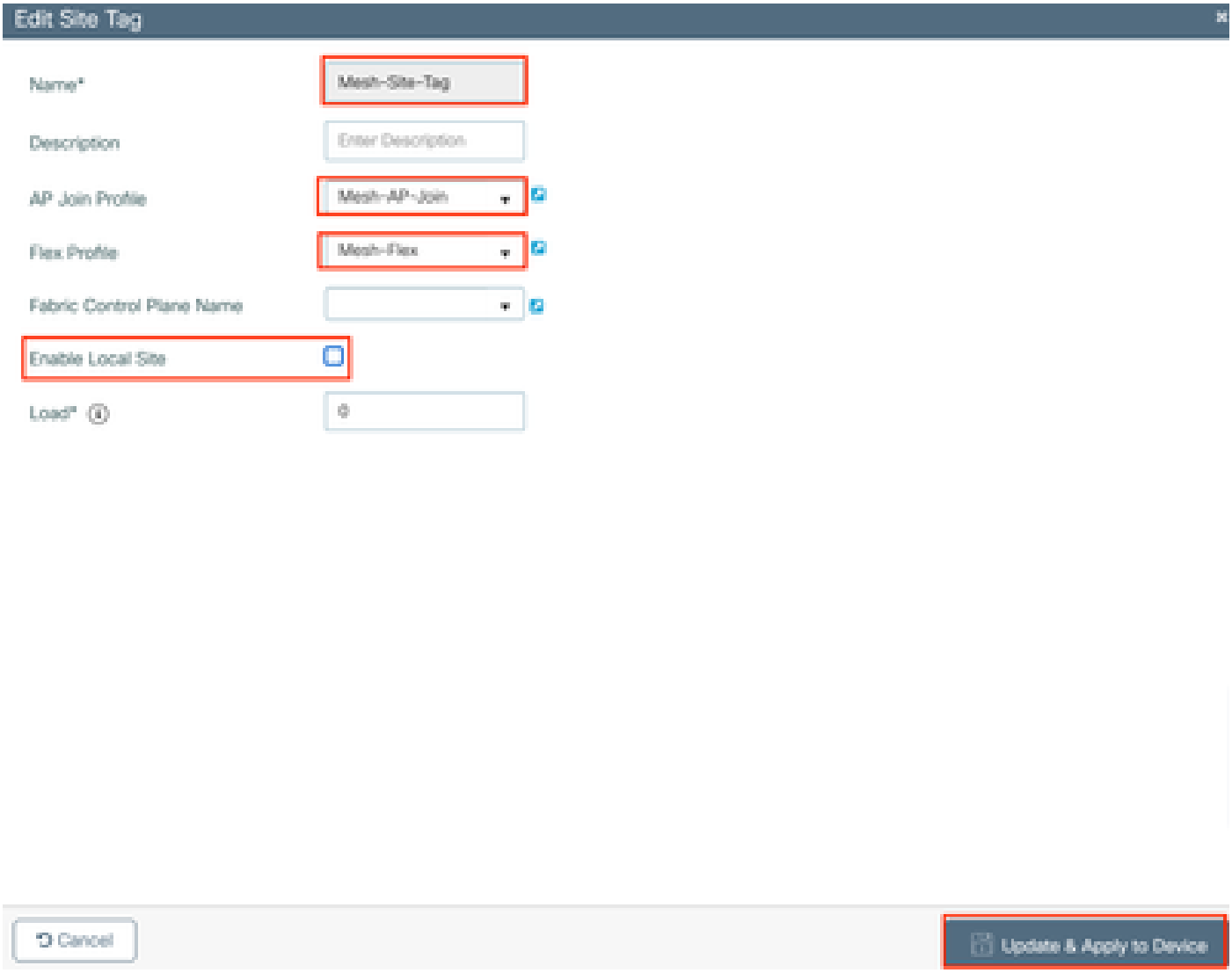


Site Tag

Step 1: Navigate to **Configuration** > **Tags & Profiles** > **Tags** > **Site** and click **Add.**



Step 2: Configure the Tag **Name**, disable the **Enable Local Site** option, and associate both the **AP Join Profile** and the **Flex Profile**.

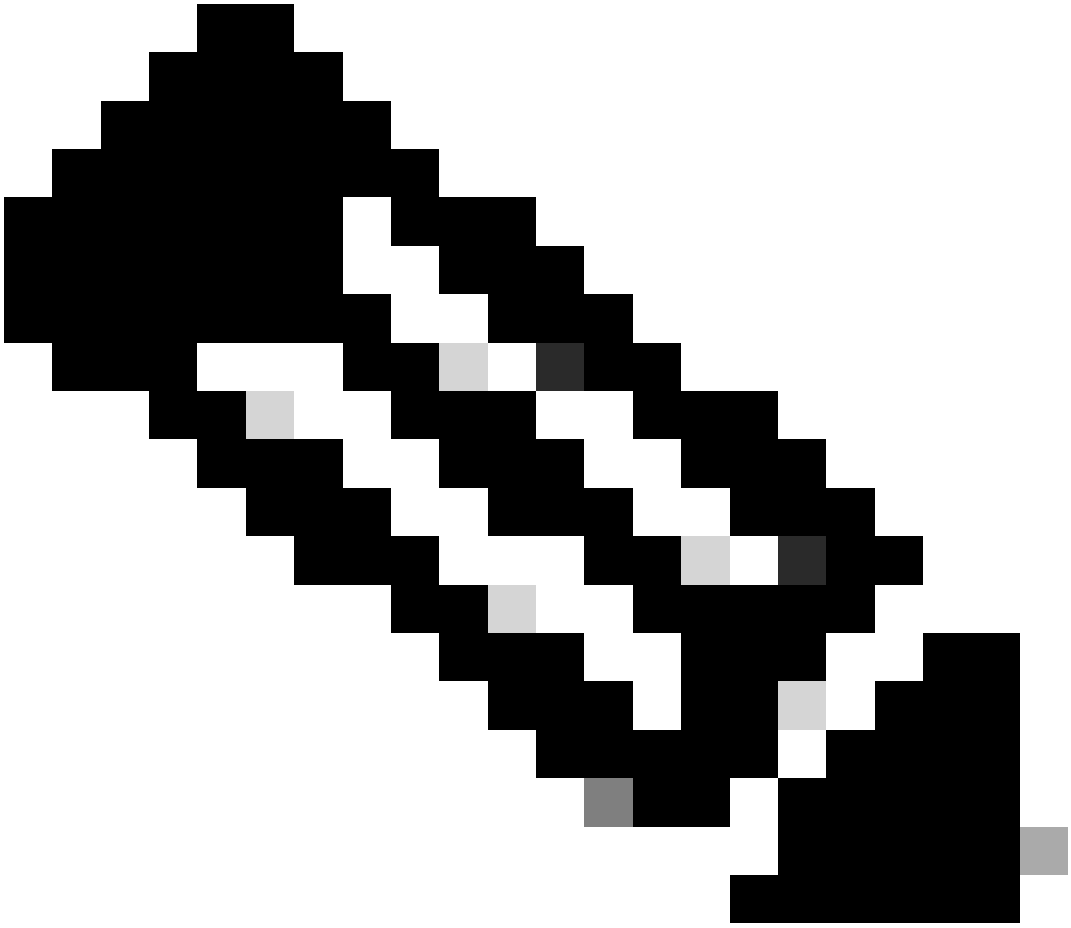


Configuration of Access Points

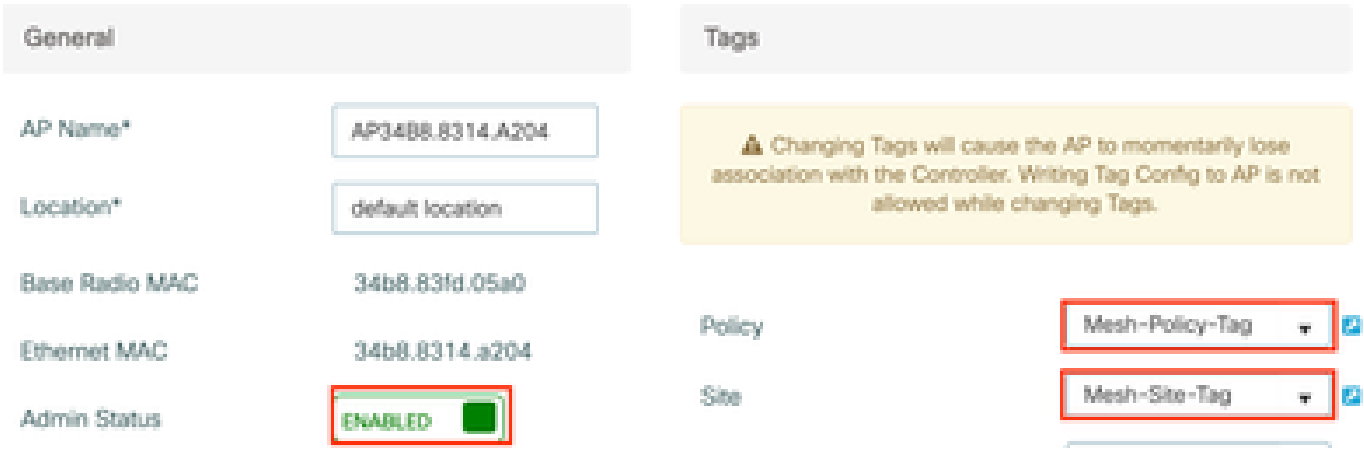
This case study assumes the Access Point (AP) is first joined to the Wireless LAN Controller (WLC) in Local Mode and then transitioned to Flex+Bridge mode.

Step 1: Navigate to **Configuration** > **Wireless** > **Access Points** and Select the **AP**.

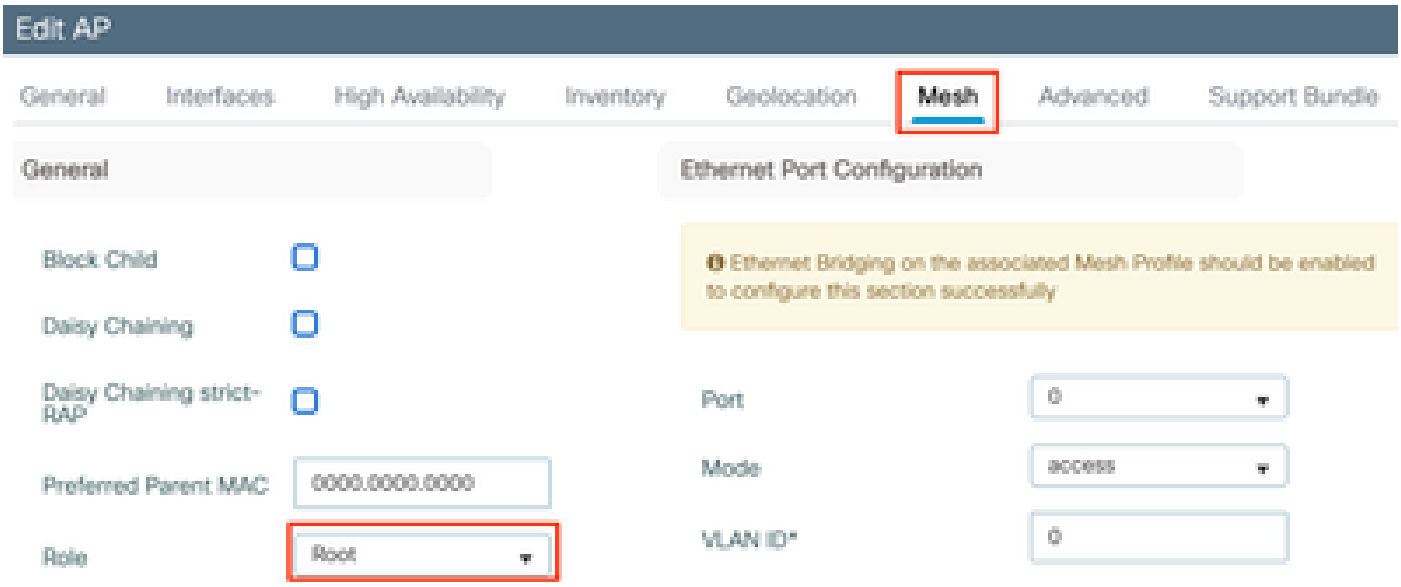
Step 2: Assign the **Site Tag** and **Policy Tag** to the Access Points (APs).



Note: The Access Point (AP) reboots, establish connection with the controller in Flex+Bridge mode, and the Mesh tab is available.



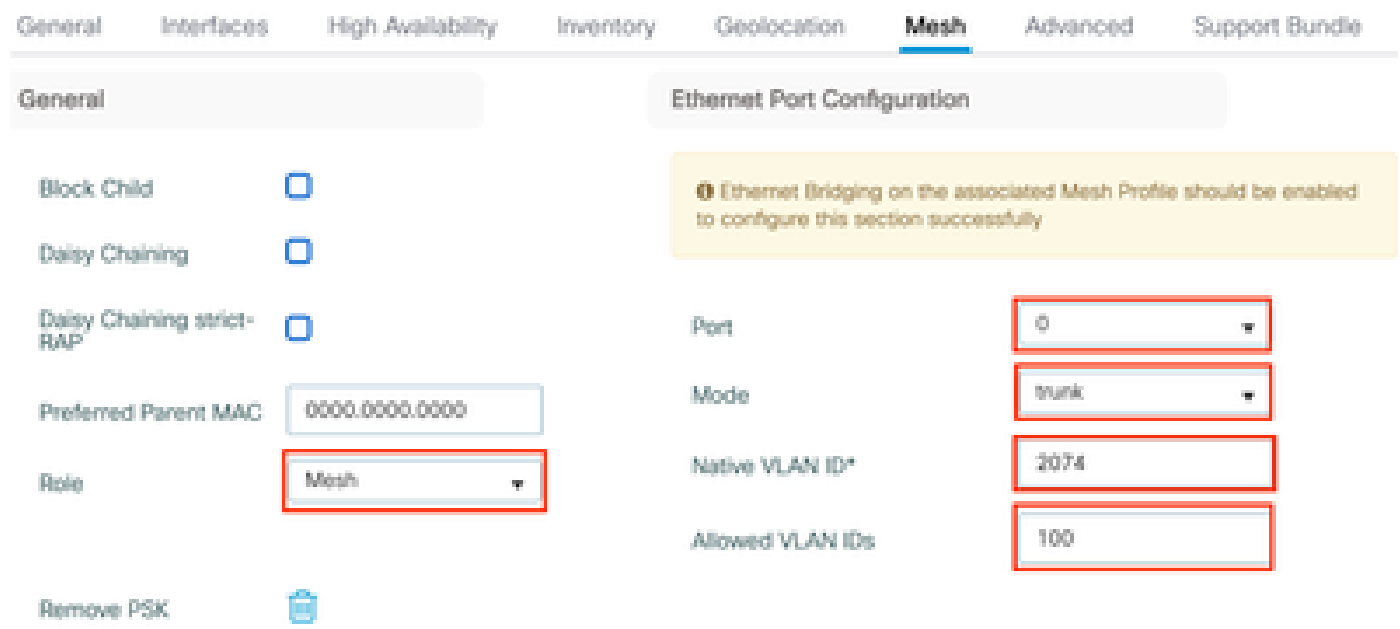
Step 3: Under the **Mesh** Tab, Select the Role to **Root**



Step 4: Repeat Steps 1 and 2 for the Access Point (AP) designated to function as a Mesh AP to bring it online in Flex+Bridge mode. Navigate to the **Mesh** tab and configure the role as **Mesh**.

Step 5: The Mesh Access Point is connected to the switch on Port 0, configured in **Trunk Mode**, with the APs VLAN set as **Native VLAN**. Ensure the **allowed VLANs** include the client VLAN specified in the Flex profile.

Step 6: Click **Update and Apply**.



Switch Port Configuration

```
interface GigabitEthernet1/0/4
switchport trunk allowed vlan 100
switchport mode trunk
end
```

Verify

Mesh AP association to Root AP:

```
#show wireless mesh ap summary
AP Name AP Model BVI MAC BGN AP Role
------- ------------------- ------- --- -------
AP34B8.8314.A2O4 C9124AXI-ROW 34b8.8314.a2O4 Default Root AP
APC828.E536.D47C C9124AXI-ROW c828.e536.d47c Default Mesh AP
Number of Flex+Bridge APs : 2
Number of Flex+Bridge RAPs : 1
Number of Flex+Bridge MAPs : 1
```

```
#show wireless mesh ap tree
=========================================================================
AP Name [Hop Ctr,Link SNR,BG Name,Channel,Pref Parent,Chan Util,Clients]
=========================================================================
[Sector 1]
-----------
AP34B8.8314.A2O4 [0, 0, Default, (36,40), 0000.0000.0000, 5%, 0]
|-APC828.E536.D47C [1, 68, Default, (36,40), 0000.0000.0000, 6%, 0]

Number of Bridge APs : 2
Number of RAPs : 1
Number of MAPs : 1
```

Client association on the Mesh AP:

```
#show flexconnect client
Flexconnect Clients:
mac radio vap aid state encr aaa-vlan aaa-acl aaa-ipv6-acl assoc auth switching key-method roam key-pro
52:95:C7:EE:B7:E5 0 0 1 FWD AES_CCM128 none none none Local Central Local Other regular No Yes No 0

#show controllers dot11Radio 0 client
 mac radio vap aid state encr Maxrate Assoc Cap is_wgb_wired wgb_mac_addr
52:95:C7:EE:B7:E5 0 0 1 FWD AES_CCM128 MCS92SS HE HE false 00:00:00:00:00:00

#show flexconnect client aaa-override
Flexconnect Clients:
mac vlan qos acl ipv6-acl vlan-name avgdtds avgrtdtds bstdtds bstrtdtds avgdtus avgrtdtus bstdtus bstrt
52:95:C7:EE:B7:E5 none none none none Bridge-VLAN 0 0 0 0 0 0 0 0
```

Traffic from the Mesh Access Point (MAP) is directly bridged to the uplink switch, bypassing the Root Access Point (RAP):

<#root>

DHCP:

```
May 30 04:25:21 APC828.E536.D47C kernel: [*05/30/2025 04:25:21.2883] [ 62081:607119] [APC828.E536.D47C]
May 30 04:25:21 APC828.E536.D47C kernel: [*05/30/2025 04:25:21.2884] chatter: dhcp_req_local_sw_nonat: 1
May 30 04:25:21 APC828.E536.D47C kernel: [*05/30/2025 04:25:21.2885] [ 62081:607245] [APC828.E536.D47C]
May 30 04:25:21 APC828.E536.D47C kernel: [*05/30/2025 04:25:21.2885] chatter: dhcp_reply_nonat: 17485791
May 30 04:25:21 APC828.E536.D47C kernel: [*05/30/2025 04:25:21.2943] [ 62081:613080] [APC828.E536.D47C]
May 30 04:25:21 APC828.E536.D47C kernel: [*05/30/2025 04:25:21.2943] [ 62081:613123] [APC828.E536.D47C]
```

ARP:

```
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0572] [ 62464:537183] [APC828.E536.D47C]
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0572] [ 62464:537219] [APC828.E536.D47C]
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0573] chatter: ethertype_cl1: 1748579504.
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0628] [ 62464:542842] [APC828.E536.D47C]
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0629] chatter: fromdevs_arp_resp: arp rep
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0629] [ 62464:542971] [APC828.E536.D47C]
May 30 04:31:44 APC828.E536.D47C kernel: [*05/30/2025 04:31:44.0630] [ 62464:543018] [APC828.E536.D47C]
May 30 04:31:45 APC828.E536.D47C kernel: [*05/30/2025 04:31:45.4301] [ 62465:910100] [APC828.E536.D47C]
```

ICMP:

```
May 30 04:32:09 APC828.E536.D47C kernel: [*05/30/2025 04:32:09.3059] [ 62489:785903] [APC828.E536.D47C]
May 30 04:32:09 APC828.E536.D47C kernel: [*05/30/2025 04:32:09.3059] [ 62489:785938] [APC828.E536.D47C]
May 30 04:32:09 APC828.E536.D47C kernel: [*05/30/2025 04:32:09.3104] [ 62489:790444] [APC828.E536.D47C]
May 30 04:32:09 APC828.E536.D47C kernel: [*05/30/2025 04:32:09.3105] [ 62489:790534] [APC828.E536.D47C]
May 30 04:32:09 APC828.E536.D47C kernel: [*05/30/2025 04:32:09.3105] [ 62489:790583] [APC828.E536.D47C]
```