

Configure Remote LAN (RLAN) on Access Point Catalyst 9124

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Introduction

This document describes how to configure Remote Local Area Network (RLAN) on AP Catalyst 9124 model using WLC model 9800.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- 9800 WLC
- Command-line Interface (CLI) access to the wireless controllers and Access Points.

Components Used

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

- Catalyst 9800-L WLC version 17.09.05
- C9124 Series AP

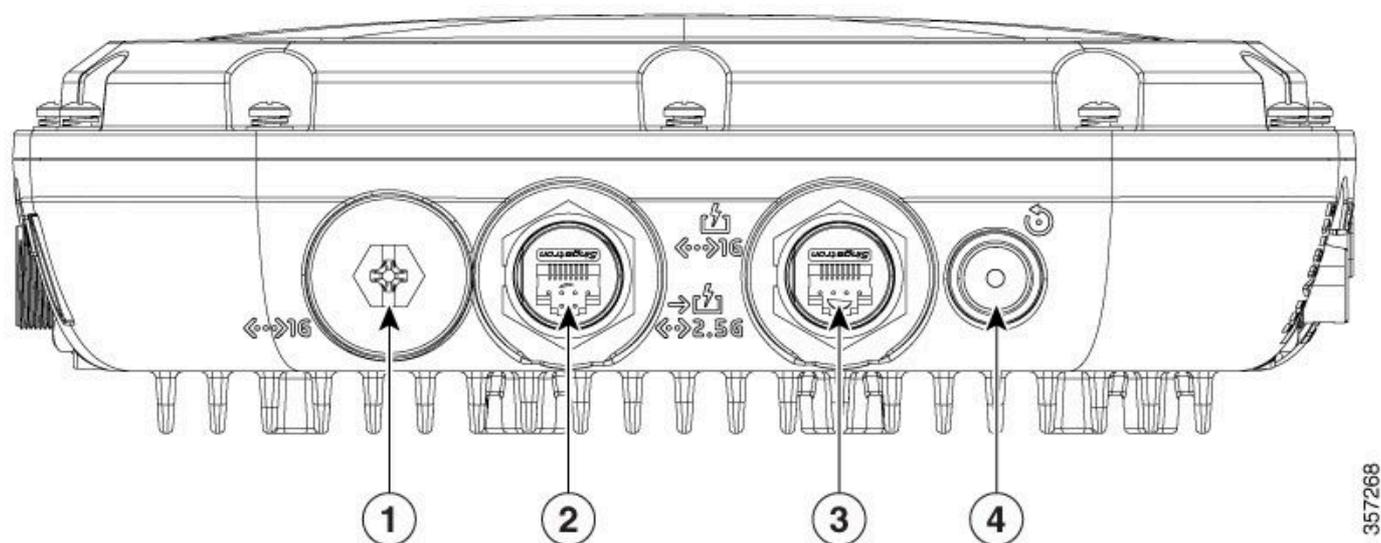
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background

A Remote LAN (RLAN) is used for authenticating wired clients using the controller. Once the wired client successfully joins the controller, the LAN ports switch the traffic between central or local switching modes. The traffic from the wired clients is treated as wireless client traffic. The RLAN in Access Point (AP) sends the authentication request to authenticate the wired client. The authentication of the wired clients in RLAN is similar to the central authenticated wireless client.

For more detailed information about RLAN, please visit the [Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide](#).

RLAN is supported in APs that have more than one Ethernet port and AP model 9124 contains 2 Ethernet ports named GigabitEthernet0 and LAN1, labeled as 2 and 3 respectively in the picture:



9124 Ethernet ports

Complete HW details please read the [Cisco Catalyst 9124AX Series Outdoor Access Point Hardware Installation Guide](#).

Configure

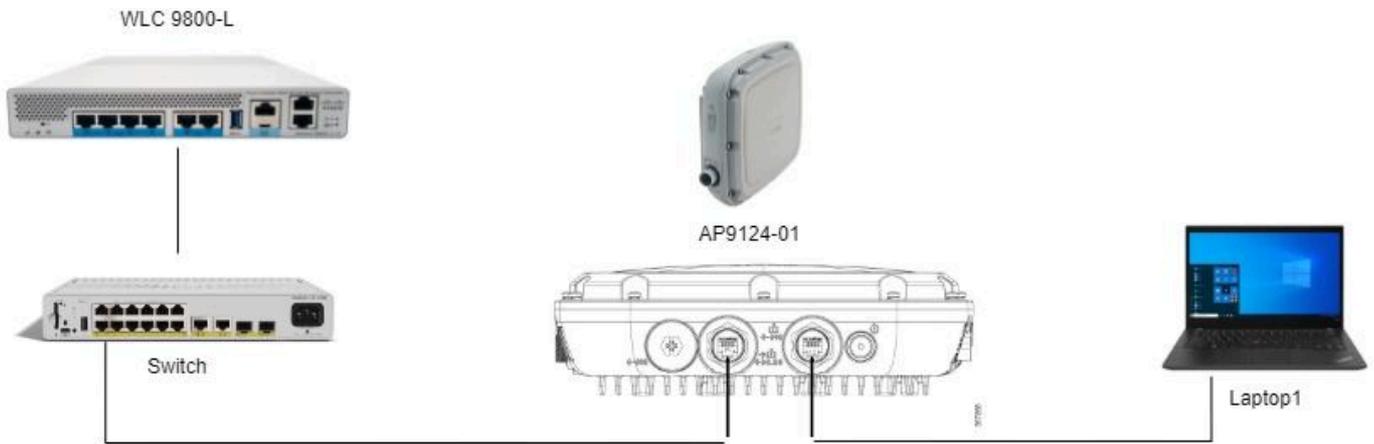
This document assumes that the AP is already joined to the WLC.

If you need guidance on joining AP 9124 to WLC, please read this guide: [Configure Mesh on Catalyst 9800 Wireless LAN Controllers](#).

AP supports RLAN both on Local Mode and Flex Mode. If you need RLAN traffic to be locally switched, the AP mode must be Flex and configure the RLAN Profile accordingly.

Note: If you set AP as Flex+Bridge mode, the AP logs a message like: "*RLAN_CFG: enable_LAN_port Cannot enable LAN[0]: ClickPort 66: Feature not supported on Mesh*".

Network Diagram



Topology

Configurations

AAA Configuration

1. In this document, the security method for the RLAN is MAC filtering, therefore you need to configure AAA in advance. You can have the mac addresses in a remote AAA server or locally on the WLC.

Here the local WLC database is used. Add the mac address of the client **without any delimiters**, that is expected to connect to the RLAN to the **Device Authentication** list:

The screenshot shows the Cisco Catalyst 9800-L Wireless Controller configuration interface. The navigation path is Configuration > Security > AAA. The 'AAA Advanced' section is active, showing a table for MAC Address and Serial Number. A 'Quick Setup: MAC Filtering' dialog box is open, with the following fields:

- MAC Address*: fbe43bee53af
- Attribute List Name: None
- Description: RLAN Client
- WLAN Profile Name: Select a value

Buttons for 'Cancel' and 'Apply to Device' are visible at the bottom of the dialog.

Device Management Local DB

2. Configure the **Authorization** method to use the local database. Here named *RLAN_macF*:

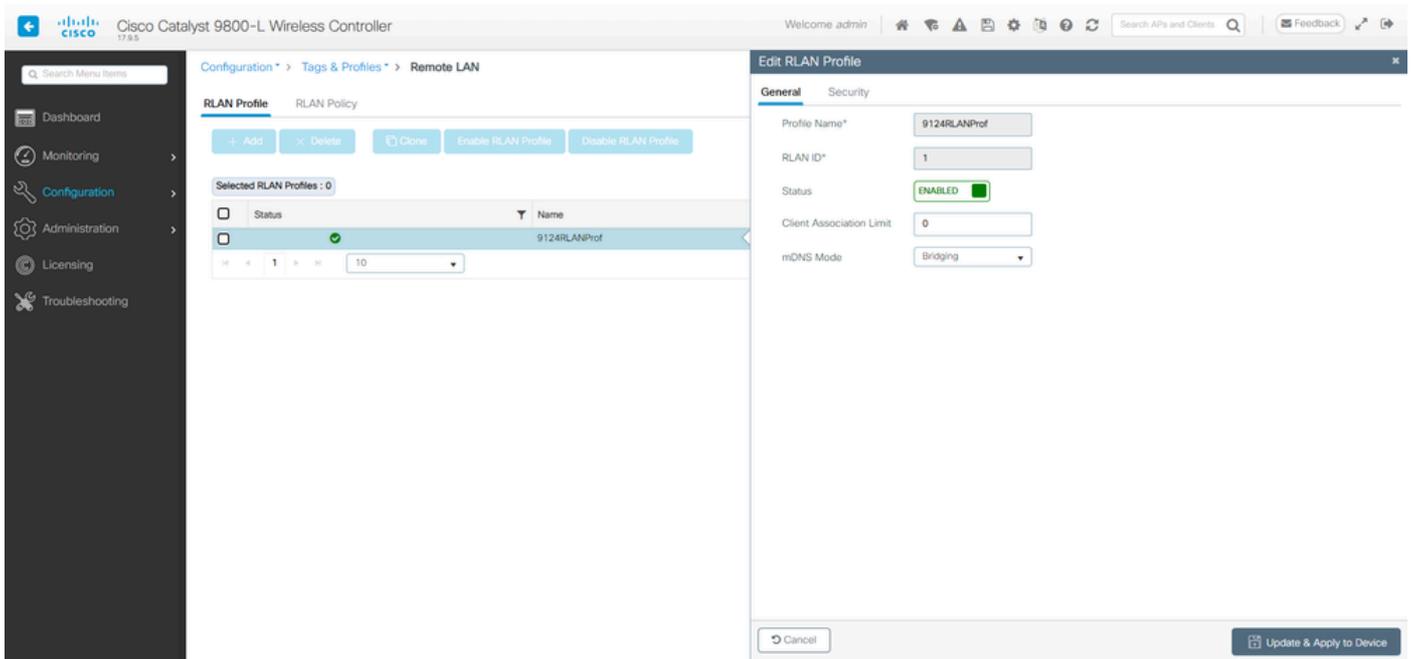
The screenshot shows the Cisco Catalyst 9800-L Wireless Controller configuration interface. The navigation path is Configuration > Security > AAA. The 'AAA Method List' section is active, showing a table with columns for Name, Type, and Group Type. A 'Quick Setup: AAA Authorization' dialog box is open, with the following fields:

- Method List Name*: RLAN_macF
- Type*: network
- Group Type: local
- Authenticated:
- Available Server Groups: radius, ldap, tacacs+, radius_sie
- Assigned Server Groups: (empty)

Buttons for 'Add' and 'Delete' are visible above the table, and navigation arrows are visible between the server group lists.

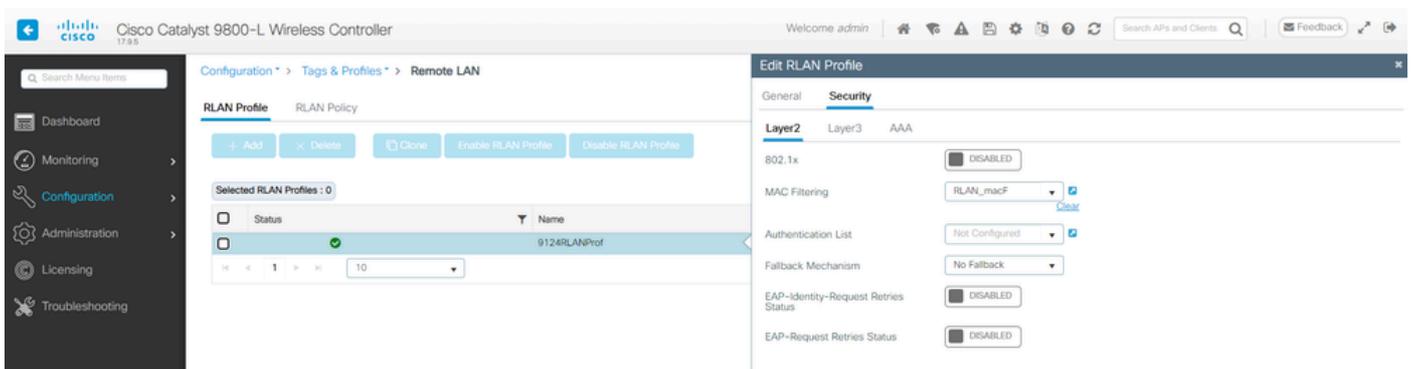
RLAN Configuration

1. In order to create **RLAN Profile**, navigate to **Configuration > Wireless > Remote LAN** and enter a **Profile Name** and **RLAN ID** for the **RLANProfile**, as shown in this image.



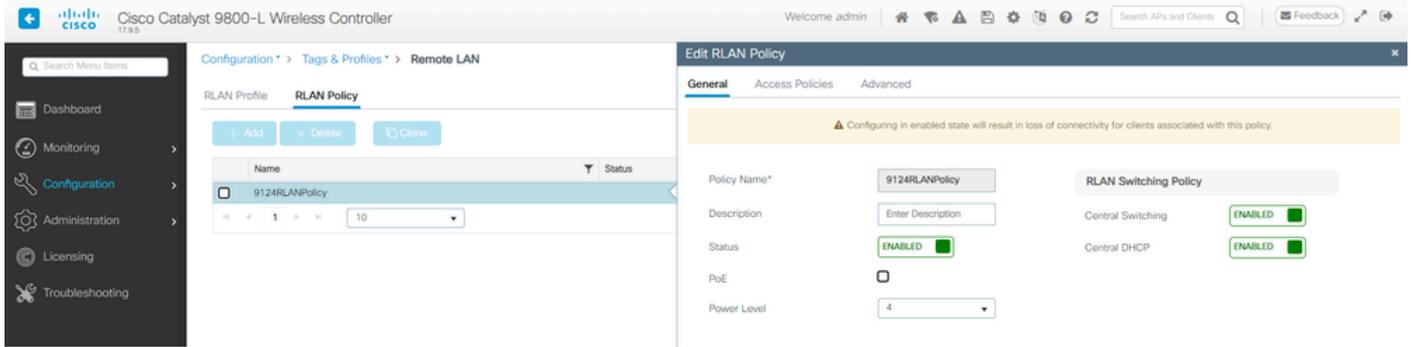
RLAN Profile General

2. Navigate to **Security**. In this example, the security method used is **MAC Filtering**. Go to **Layer 2**, leave **802.1x** to **Disabled** and select the Authorization method for **MAC Filtering**, as shown in this image.



RLAN Security

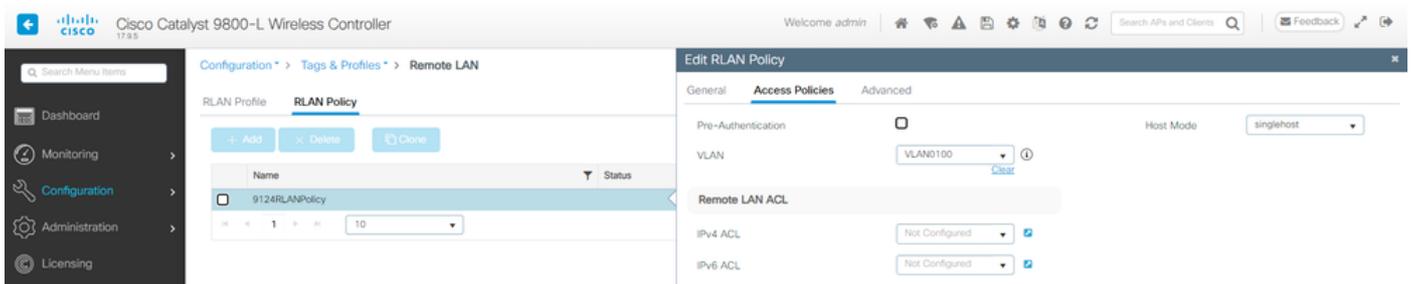
3. Create the RLAN Policy. Navigate to **Configuration > Wireless > Remote LAN** and on the **Remote LAN** page, click **RLAN Policy** tab, as shown in this image.



RLAN Policy

In this setup, all traffic is **Centrally Switched** at the WLC.

4. Navigate to **Access Policies** and configure the **VLAN** and **Host Mode** and apply the settings.



RLAN Policy Access Policies

5. Create a **PolicyTag** and map **RLAN Profile** to **RLAN Policy**. Navigate to **Configuration > Tags & Profiles > Tags**.

Edit Policy Tag

Name*

Description

WLAN-POLICY Maps: 0

WLAN Profile	Policy Profile
No items to display	

RLAN-POLICY Maps: 1

Port ID	RLAN Profile	RLAN Policy Profile
<input type="checkbox"/> 1	9124RLANProf	9124RLANPolicy

Map RLAN and Policy

RLAN Profile*

RLAN Policy Profile*

Policy Tag

6. We must apply the **Policy Tag** to the AP and **Enable** the **LAN** port. Navigate to **Configuration > Wireless > Access Points** and click on the AP.

The screenshot shows the Cisco Catalyst 9800-L Wireless Controller interface. The main navigation pane on the left includes Dashboard, Monitoring, Configuration, Administration, and Licensing. The main content area displays 'All Access Points' with a table listing APs. The 'Edit AP' window is open, showing the 'Tags' tab where the '9124RLANPoTag' policy is assigned to the AP. The 'General' tab shows AP Name 'AP9124_01', Location 'WGB_LAB_Test', Base Radio MAC '4ca6.4d23.a0e0', and Ethernet MAC '3c57.31c5.ac2c'.

Policy Tag on AP configuration

Apply the setting and the AP re-joins the WLC. Click on the AP, then select **Interfaces** and enable the **LAN** port in the **LAN Port Settings**.

Edit AP

General **Interfaces** High Availability Inventory ICap Advanced Support Bundle

Ethernet Interfaces

Interface	Operation Status	Speed	Rx Packets	Tx Packets	Discarded Packets
GigabitEthernet0	🟢	1000 Mbps	22065	12905	0
GigabitEthernet1	🔴	Auto	0	0	0
LAN1	🔴	Auto	11682	156	0

1 - 3 of 3 items

Radio Interfaces

Slot No	Interface	Band	Admin Status	Operation Status	Spectrum Admin Status	Spectrum Operation Status	Regulatory Domain
0	802.11ax - 2.4 GHz	All	Enabled	🟢	Enabled	🟢	-A
1	802.11ax - 5 GHz	All	Enabled	🟢	Enabled	🟢	-B

1 - 2 of 2 items

Power Over Ethernet Settings

Power Type/Mode: PoE/Medium Power (25.5 W)

PoE Pre-Standard Switch: Disabled

PoE Power Injector MAC Address: Disabled

LAN Port Settings

Port ID	Status	VLAN ID	PoE	Power Level	RLAN
LAN1	<input checked="" type="checkbox"/>	100	<input type="checkbox"/>	NA	🟢

1 - 1 of 1 items

AP LAN1 port settings

Apply the settings and verify the status. Make sure the **RLAN** shows **Green**.

FlexConnect Local Switching RLAN

If you need **RLAN** traffic to be locally switched, the AP mode must be **Flex** and configure the **RLAN Profile** accordingly.

Note: If you set AP as **Flex+Bridge** mode, the AP logs a message like: *"RLAN_CFG: enable_LAN_port Cannot enable LAN[0]: ClickPort 66: Feature not supported on Mesh"*.

1. Start by the **Flex Profile** configuration to be applied to the **Site Tag**. Ensure to configure the correct native **VLAN** and push the correct client **VLAN(s)** to the Flex AP.

Cisco Catalyst 9800-L Wireless Controller

Welcome admin

Configuration > Tags & Profiles > Flex

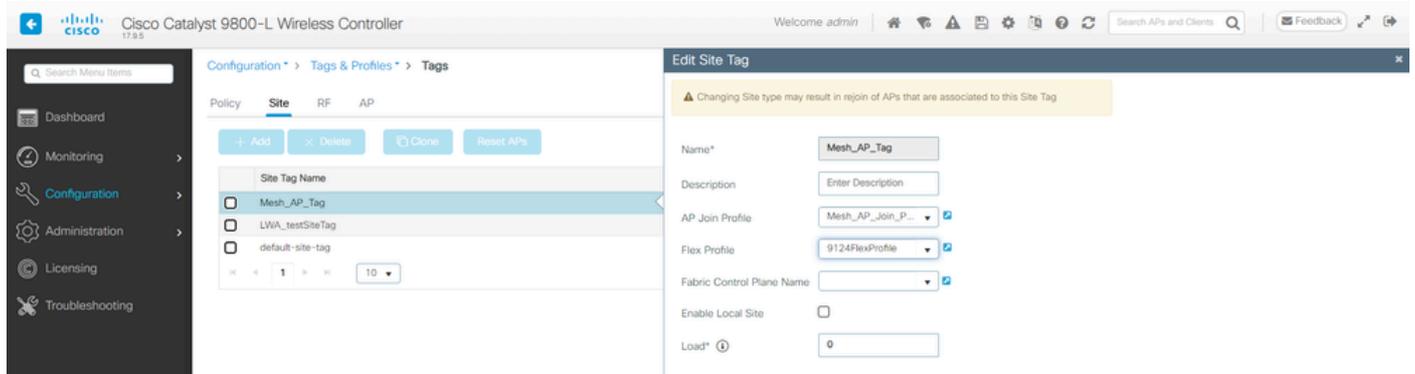
Edit Flex Profile

General Local Authentication Policy ACL **VLAN** DNS Layer Security

VLAN Name	ID	Ingress ACL	Egress ACL
VLAN0100	100		
VLAN0101	101		

1 - 2 of 2 items

2. To change the AP 9124 to **FlexConnect** mode, you need to disable the option "**Enable Local Site**" in the **Site Tag** configuration. After that, the option to select the **Flex Profile** appears. Select the **Flex Profile** configured previously:



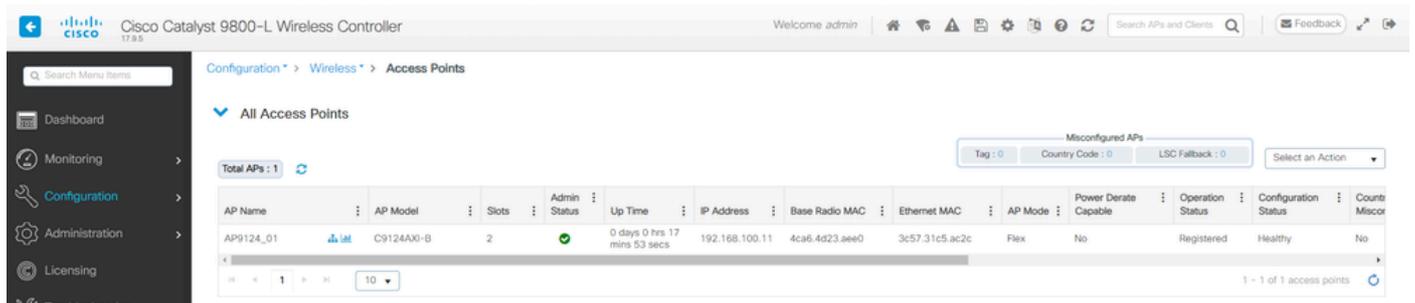
Site Tag Disable Local Site

Once you click on **Update and Apply to Device**, the AP console logs:

```
[*08/29/2024 08:25:13.2976] Previous AP mode is 0, change to 2
[*08/29/2024 08:25:13.3213] DOT11_CFG[0] Radio Mode is changed from Local to FlexConnect
[*08/29/2024 08:25:13.3219] DOT11_DRV[0]: Stop Radio0 - Begin
[*08/29/2024 08:25:13.3237] wlan: [0:I:CMN_MLME] mlme_ext_vap_down: VAP (mon0) is down
[*08/29/2024 08:25:13.3262] DOT11_DRV[0]: Stop Radio0 - End
[*08/29/2024 08:25:13.3263] DOT11_CFG[0]: Starting radio 0
[*08/29/2024 08:25:13.3268] DOT11_DRV[0]: Start Radio0 - Begin
[*08/29/2024 08:25:13.3434] DOT11_DRV[0]: Start Radio0 - End
[*08/29/2024 08:25:13.3522] wlan: [0:I:CMN_MLME] mlme_ext_vap_up: VAP (mon0) is up
[*08/29/2024 08:25:13.3756] DOT11_CFG[1] Radio Mode is changed from Local to FlexConnect
[*08/29/2024 08:25:13.3920] DOT11_DRV[1]: Stop Radiol - Begin
[*08/29/2024 08:25:13.3940] wlan: [0:I:CMN_MLME] mlme_ext_vap_down: VAP (mon1) is down
[*08/29/2024 08:25:13.3963] DOT11_DRV[1]: Stop Radiol - End
[*08/29/2024 08:25:13.3964] DOT11_CFG[1]: Starting radio 1
[*08/29/2024 08:25:13.3969] DOT11_DRV[1]: Start Radiol - Begin
[*08/29/2024 08:25:13.3980] DOT11_DRV[1]: Start Radiol - End
[*08/29/2024 08:25:13.4143] wlan: [0:I:CMN_MLME] mlme_ext_vap_up: VAP (mon1) is up
```

AP mode change Local to Flex

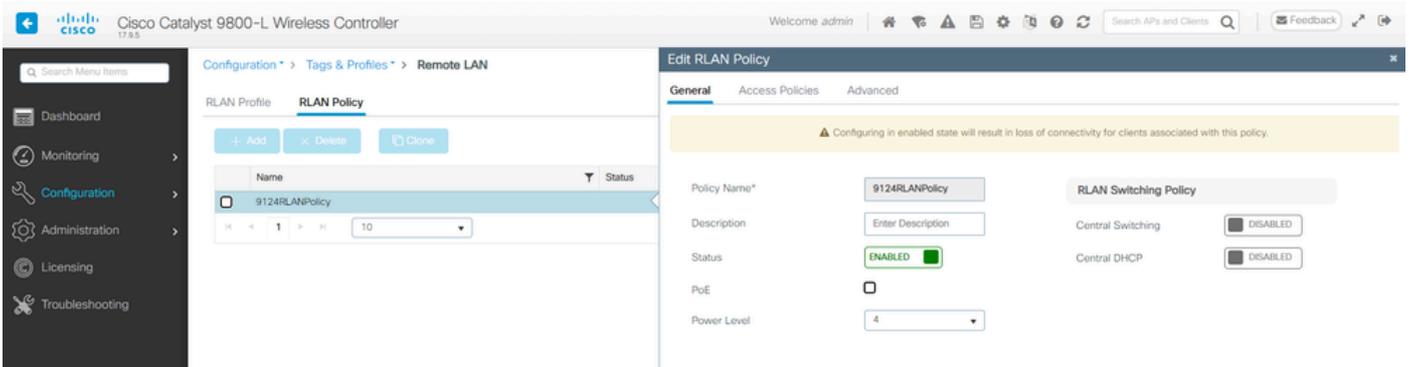
And the AP now shows **Flex** as **AP Mode**:



Note: When we move the AP from Local to Flex mode, the AP does NOT reload, however when we move

from Flex to Local mode, the AP reloads.

3. Go to **Configuration > Tags & Profiles > Remote LAN > RLAN Policy** and edit the **RLAN Switching Policy** for Local Switching. Disable **Central Switching** and **Central DHCP**:



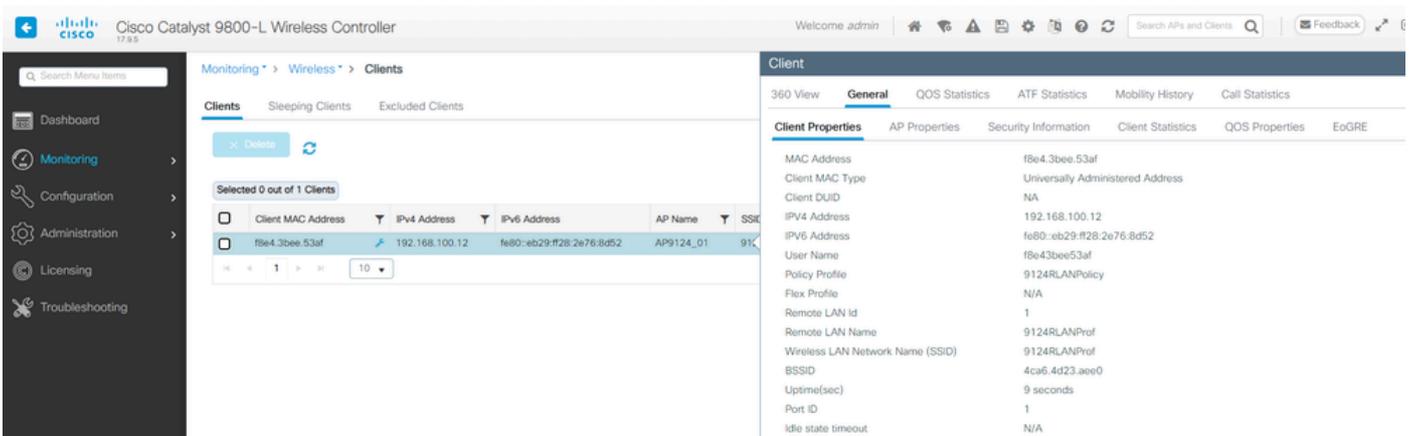
RLAN Policy Local Switching

Verify

Central Switching

Connect a PC in the LAN1 port of the AP. PC authenticates via MAB and gets an IP address from the configured VLAN.

Navigate to **Monitoring > Wireless > Clients** to check the client status.



Client details

From the AP CLI you can view the port status change and client details:

```
AP9124_01#debug client F8:E4:3B:EE:53:AF
AP9124_01#debug rlan
critical Enable RLAN critical level debugging
errors Enable RLAN error level debugging
events Enable RLAN event level debugging
info Enable RLAN info level debugging
```

```
AP9124_01#show wired clients
Total wired clients: 1
mac port state local_client detect_ago associated_ago tx_pkts tx_bytes rx_pkts rx_bytes
```

F8:E4:3B:EE:53:AF 2 ASSOCIATED No 12 12 9 1074 337 55639

```
AP9124_01#debug rlan info
AP9124_01#debug rlan eve
AP9124_01#debug client F8:E4:3B:EE:53:AF
AP9124_01#[*08/29/2024 08:51:12.7861] chatter: wiredif_mapper :: WiredIfMapper - Invalid Port 2 State 1
[*08/29/2024 08:51:12.7861] chatter: Device wired2 notify state change link UP
[*08/29/2024 08:51:13.3611] RLAN_EVENT-RlanPortControl: LAN-Port[0] UP Event
[*08/29/2024 08:51:16.8306] RLAN_EVENT-RlanPortControl: LAN-Port[0] Detect client F8:E4:3B:EE:53:AF
[*08/29/2024 08:51:16.8307] RLAN_EVENT-RlanPortControl: LAN-Port[0] send_assoc for client F8:E4:3B:EE:53:AF
[*08/29/2024 08:51:16.8308] CLSM[F8:E4:3B:EE:53:AF]: US Assoc Req(0) IF 5 slot 16 port_id 0 vap_id 0 Len 52 client state UNASSOC
[*08/29/2024 08:51:16.8309] CLSM[F8:E4:3B:EE:53:AF]: client moved from UNASSOC to ASSOC
[*08/29/2024 08:51:16.8341] CLSM[F8:E4:3B:EE:53:AF]: DS Assoc Resp(10) IF 87 slot 16 vap 0 state ASSOC
[*08/29/2024 08:51:16.8372] CLSM[F8:E4:3B:EE:53:AF]: Added to ClientIPTable on wired2
[*08/29/2024 08:51:16.8375] RLAN_CFG: rlan_add_client client F8:E4:3B:EE:53:AF, port 0 vlan: 0
[*08/29/2024 08:51:16.8377] CLSM[F8:E4:3B:EE:53:AF]: Add RLAN client succeeded in vap 0
[*08/29/2024 08:51:16.8378] CLSM[F8:E4:3B:EE:53:AF]: client moved from ASSOC to FND
[*08/29/2024 08:51:16.8379] CLSM[F8:E4:3B:EE:53:AF]: Added to WCP client table AID 0 Radio 16 Vap 0
[*08/29/2024 08:51:16.8381] CLSM[F8:E4:3B:EE:53:AF]: Decoding TLV_CLIENTCAPABILITYPAYLOAD: capability: 0 Apple Client: No
[*08/29/2024 08:51:18.0620] chatter: eap_from_cli: 60 | 4ca64d23 aee0f8e4 3bee53af 888e0101 00000000 00000000 00000000 00000000 00000000 00000000 0000
0000 00000000 00000000 00000000 00000000
[*08/29/2024 08:51:19.6631] chatter: ethertype_c11: 1724921479.663102627: arp who-has 169.254.233.120 tell 0.0.0.0
[*08/29/2024 08:51:20.6609] chatter: ethertype_c11: 1724921480.660846272: arp who-has 169.254.233.120 tell 0.0.0.0
[*08/29/2024 08:51:21.1727] chatter: dhcp_from_inet: 1724921481.172667939: 0.0.0.0.68 > 255.255.255.255.67: udp 309
[*08/29/2024 08:51:21.1746] chatter: dhcp_reply_nonat: 1724921481.174640751: 192.168.101.1.67 > 192.168.101.11.68: udp 308
[*08/29/2024 08:51:21.2150] chatter: ethertype_c11: 1724921481.215028303: arp who-has 192.168.101.1 tell 192.168.101.11
[*08/29/2024 08:51:21.5063] chatter: ethertype_c11: 1724921481.506300855: arp who-has 192.168.101.1 tell 192.168.101.11
[*08/29/2024 08:51:21.6544] chatter: ethertype_c11: 1724921481.654387730: arp who-has 192.168.101.11 tell 0.0.0.0
[*08/29/2024 08:51:22.6518] chatter: ethertype_c11: 1724921482.651782313: arp who-has 192.168.101.11 tell 0.0.0.0
[*08/29/2024 08:51:23.0676] chatter: eap_from_cli: 60 | 4ca64d23 aee0f8e4 3bee53af 888e0101 00000000 00000000 00000000 00000000 00000000 00000000 0000
0000 00000000 00000000 00000000 00000000
[*08/29/2024 08:51:23.6552] chatter: ethertype_c11: 1724921483.655126375: arp who-has 192.168.101.11 tell 0.0.0.0
[*08/29/2024 08:51:24.6645] chatter: ethertype_c11: 1724921484.664425489: arp who-has 192.168.101.11 tell 192.168.101.11
```

Flex-Connect Local Switching

```
AP9124_01#[*08/28/2024 14:16:30.7138] chatter: wiredif_mapper :: WiredIfMapper - Invalid Port 2 State 1
[*08/28/2024 14:16:30.7138] chatter: Device wired2 notify state change link UP
[*08/28/2024 14:16:30.9659] RLAN_EVENT-RlanPortControl: LAN-Port[0] UP Event
[*08/28/2024 14:16:33.2574] RLAN_EVENT-RlanPortControl: LAN-Port[0] Detect client F8:E4:3B:EE:53:AF
[*08/28/2024 14:16:33.2574] RLAN_EVENT-RlanPortControl: LAN-Port[0] send_assoc for client F8:E4:3B:EE:53:AF
[*08/28/2024 14:16:33.2576] CLSM[F8:E4:3B:EE:53:AF]: US Assoc Req(0) IF 5 slot 16 port_id 0 vap_id 0 Len 52 client state UNASSOC
[*08/28/2024 14:16:33.2576] CLSM[F8:E4:3B:EE:53:AF]: client moved from UNASSOC to ASSOC
[*08/28/2024 14:16:33.2619] CLSM[F8:E4:3B:EE:53:AF]: DS Assoc Resp(10) IF 87 slot 16 vap 0 state ASSOC
[*08/28/2024 14:16:33.2654] CLSM[F8:E4:3B:EE:53:AF]: Added to ClientIPTable on wired2
[*08/28/2024 14:16:33.2657] RLAN_CFG: rlan_add_client client F8:E4:3B:EE:53:AF, port 0 vlan: 101
[*08/28/2024 14:16:33.2659] CLSM[F8:E4:3B:EE:53:AF]: Add RLAN client succeeded in vap 0
[*08/28/2024 14:16:33.2660] CLSM[F8:E4:3B:EE:53:AF]: client moved from ASSOC to FWD
[*08/28/2024 14:16:33.2661] CLSM[F8:E4:3B:EE:53:AF]: Added to WCP client table AID 0 Radio 16 Vap 0
[*08/28/2024 14:16:33.2664] CLSM[F8:E4:3B:EE:53:AF]: ADD_CENTRAL_AUTH_INFO_MOBILE Payload
[*08/28/2024 14:16:33.2667] CLSM[F8:E4:3B:EE:53:AF]: TLV_FLEX_CENTRAL_AUTH_STA_PAYLOAD
[*08/28/2024 14:16:33.2669] CLSM[F8:E4:3B:EE:53:AF]: Decoding TLV_CLIENTCAPABILITYPAYLOAD: capbaility: 0 Apple Client: No
[*08/28/2024 14:16:35.4185] chatter: eap_from_cli: 60 | 4ca64d23 aee0f8e4 3bee53af 888e0101 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
[*08/28/2024 14:16:35.7577] chatter: dhcp_req_local_sw_nonat: 1724854595.757647899: 0.0.0.0.68 > 255.255.255.255.67: udp 345
[*08/28/2024 14:16:35.7618] chatter: dhcp_from_inet: 1724854595.761843211: 192.168.101.1.67 > 192.168.101.11.68: udp 308
[*08/28/2024 14:16:35.7619] chatter: dhcp_reply_nonat: 1724854595.761843211: 192.168.101.1.67 > 192.168.101.11.68: udp 308
[*08/28/2024 14:16:35.7834] chatter: ethertype_c11: 1724854595.783373680: arp who-has 192.168.101.1 tell 192.168.101.11
[*08/28/2024 14:16:35.7844] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:16:36.0169] chatter: ethertype_c11: 1724854596.016884669: arp who-has 192.168.101.11 tell 0.0.0.0
[*08/28/2024 14:16:36.0537] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:16:37.0143] chatter: ethertype_c11: 1724854597.014276961: arp who-has 169.254.233.120 tell 0.0.0.0
[*08/28/2024 14:16:38.0098] chatter: ethertype_c11: 1724854598.009745033: arp who-has 169.254.233.120 tell 0.0.0.0
[*08/28/2024 14:16:39.0159] chatter: ethertype_c11: 1724854599.015890970: arp who-has 169.254.233.120 tell 0.0.0.0
[*08/28/2024 14:16:40.4324] chatter: eap_from_cli: 60 | 4ca64d23 aee0f8e4 3bee53af 888e0101 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
[*08/28/2024 14:16:41.0055] chatter: ethertype_c11: 1724854601.005426230: arp who-has 192.168.101.11 tell 192.168.101.11
[*08/28/2024 14:16:44.5998] chatter: ethertype_c11: 1724854604.599751802: arp who-has 192.168.101.1 tell 192.168.101.11
[*08/28/2024 14:16:44.6010] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:16:50.5117] chatter: ethertype_c11: 1724854610.511644351: arp who-has 192.168.101.1 (64:8F:3E:D5:E5:C1) tell 192.168.101.11
[*08/28/2024 14:16:50.5129] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:16:56.0159] chatter: ethertype_c11: 1724854616.015864610: arp who-has 192.168.101.1 (64:8F:3E:D5:E5:C1) tell 192.168.101.11
[*08/28/2024 14:16:56.0181] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:17:01.5107] chatter: ethertype_c11: 1724854621.510631795: arp who-has 192.168.101.1 (64:8F:3E:D5:E5:C1) tell 192.168.101.11
[*08/28/2024 14:17:01.5118] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:17:07.5075] chatter: ethertype_c11: 1724854627.507420491: arp who-has 192.168.101.1 (64:8F:3E:D5:E5:C1) tell 192.168.101.11
[*08/28/2024 14:17:07.5086] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:17:11.3535] chatter: ethertype_c11: 1724854631.353461218: arp who-has 192.168.101.1 tell 192.168.101.11
[*08/28/2024 14:17:11.3550] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
[*08/28/2024 14:17:16.0084] chatter: ethertype_c11: 1724854636.008371529: arp who-has 192.168.101.1 (64:8F:3E:D5:E5:C1) tell 192.168.101.11
[*08/28/2024 14:17:16.0098] chatter: fromdevs_arp_resp: arp reply 192.168.101.1 is-at 64:8F:3E:D5:E5:C1
```

Debugs for Local Switched RLAN