Understand FlexConnect on Catalyst 9800 Wireless Controller

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Introduction

This document describes the FlexConnect feature and its general configuration on 9800 Wireless Controllers.

Background information

FlexConnect refers to the capability of an Access Point (AP) to decide whether the traffic from the wireless clients is put directly on the network at the AP level (Local switching) or if the traffic is centralized to the 9800 controller (Central Switching).
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 IOS-XE Gibraltar 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

This is the visual scheme of the configuration that is needed to accomplish the scenario of this document:
In order to configure a FlexConnect Local Switching Service Set Identifier (SSID) here are the general steps you need to follow:

1. Create/Modify a WLAN profile
2. Create/Modify a Policy Profile
3. Create/Modify a Policy Tag
4. Create/Modify a Flex Profile
5. Create/Modify a Site Tag
6. Policy Tag assignment to AP

These sections explain how to configure each of them, step by step.

Create/Modify a WLAN profile

You can use this guide to create the three SSIDs:

Create your SSID
Create/Modify a Policy Profile

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

When you disable Central Switching this warning message appears, click Yes and continue with the configuration.
Step 2. Go to the **Access Policies** tab and type the VLAN (You do not see it in the dropdown list because this VLAN does not exist on the 9800 WLC).

After that, click **Save & Apply to Device**.

**Note**: It is possible to use a VLAN that already exists on the 9800 WLC as local switching. If you select the VLAN from the dropdown list, you are selecting the VLAN name, not the VLAN ID, so pay a lot of attention to it, as you need to use the exact same VLAN name selected in the Policy Profile when you add the the VLANs in the Flex Profile. This bug has been filed for this behavior: [CSCvn48234](#)

Step 3. Repeat the same for the PolicyProfileFlex2
Step 4. For the centrally switched SSID, ensure its needed VLAN exists on the 9800 WLC and if not, create it.
**Declare Client's VLANs**

Step 5. Create a Policy Profile for the Central SSID.

Navigate to **Configuration > Tags & Profiles > Policy**. Either select the name of a pre-existing one or click **Add** to add a new one.
You should end up with three Policy Profiles.

<table>
<thead>
<tr>
<th>Policy Profile Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PolicyProfileFlex1</td>
<td></td>
</tr>
<tr>
<td>PolicyProfileFlex2</td>
<td></td>
</tr>
<tr>
<td>PolicyProfileCentral1</td>
<td></td>
</tr>
</tbody>
</table>

CLI:

```
# config t
# vlan 2660
# exit # wireless profile policy PolicyProfileFlex1 # no central switching # vlan 2685 # no shutdown # exit # wireless profile policy PolicyProfileFlex2 # no central switching # vlan 2686 # no shutdown # exit # wireless profile policy PolicyProfileCentral1 # vlan VLAN2660 # no shutdown # end
```

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 a pre-existing one or click **Add** to add a new one.
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 it. After that click the check mark.
Repeat for the three SSIDs, after that click **Save & Apply to Device.**

CLI:

```
# config t

# wireless tag policy PolicyTag1
# wlan Flex1 policy PolicyProfileFlex1
# wlan Flex2 policy PolicyProfileFlex2
# wlan Central1 policy PolicyProfileCentral1
```
Create/Modify a Flex Profile

In the topology used for this document you notice that there are two SSIDs in Local Switching with two different VLANs. Inside the Flex Profile is where you specify the AP's VLAN (Native VLAN) and any other VLAN that the AP needs to be aware of, in this case, the VLANs used by the SSIDs.

Step 1. Navigate to Configuration > Tags & Profiles > Flex and either create a new one or modify an existing one.

Step 2. Define a name for your Flex Profile and specify the AP's VLAN (Native VLAN ID).

Step 3. Navigate to the VLAN tab and specify the needed VLAN.

In this scenario, there are clients on VLANs 2685 and 2686. These VLANs does not exist on the
9800 WLC, add them to the Flex Profile so they exist on the AP.

**Note:** When you created the Policy Profile, if you selected a VLAN name instead of VLAN ID, ensure the VLAN name here in the Flex Profile is the exact same one. This bug has been filed for this behavior: CSCvn48234

Repeat for the needed VLANs.

Notice that the VLAN used for Central switching was not added, as the AP does not need to be aware about it.
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 a pre-existing one or click + Add to add a new one.

Step 2. Inside the Site Tag, disable Enable Local Site option (Any AP that receives a Site Tag with the Enable Local Site setting disabled is converted into FlexConnect mode). Once it is disabled you can also select the Flex Profile. After that click Save & Apply to Device.

Policy Tag assignment to AP
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 Tags and click **Update & Apply to Device**.
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.
**Note:** If the AP is configured in Local mode (or any other mode) and then it gets a Site Tag with **Enable Local Site** setting disabled, the AP reboots and comes back in FlexConnect mode.

**CLI:**

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

**Policy Tag Assignment for Multiple APs**

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

Click on **Tag APs** icon, after that 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).

Once you have selected the desired APs, click on + **Tag APs**.
Select the tags that you want to assign to the APs and click **Save & Apply to Device**.

*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.
Note: If the AP is configured in Local mode (or any other mode) and then it gets a Site Tag with Enable Local Site setting disabled, the AP reboots and comes back in FlexConnect mode.

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>
```

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 Central Switching IPv4 ACL IPv6 ACL ---------------
-----------------------------------------------------------------------------------
-----------------------------------------------------------------------------------
```

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
```