AP Joining

Failover Priority for Access Points

Each controller has a defined number of communication ports for access points. When multiple controllers with unused access point ports are deployed on the same network and one controller fails, the dropped access points automatically poll for unused controller ports and associate with them.

The following are some guidelines for configuring failover priority for access points:

- You can configure your wireless network so that the backup controller recognizes a join request from a higher-priority access point, and if necessary, disassociates a lower-priority access point as a means to provide an available port.
- Failover priority is not in effect during the regular operation of your wireless network. It takes effect only if there are more associations requests to controller than the available AP capacity on the controller.
- AP priority is checked while connecting to the controller when the controller is in full scale or the primary controller fails, the APs fallback to the secondary controller.
- You can enable failover priority on your network and assign priorities to the individual access points.
- By default, all access points are set to priority level 1, which is the lowest priority level. Therefore, you need to assign a priority level only to those access points that warrant a higher priority.

Setting AP Priority (GUI)

Procedure

Step 1 Choose **Configuration** > **Wireless** > **Access Points**.

Step 2 Click the Access Point.

Step 3 In the **Edit AP** dialog box, go to **High Availability** tab.

Step 4 Choose the priority from the **AP failover priority** drop-down list.

Step 5 Click **Update and Apply to Device**.

Setting AP Priority

Note Priority of access points ranges from 1 to 4, with 4 being the highest.

Procedure

	Command or Action	Purpose
Step 1	**ap name** *ap-name* **priority** *priority* **Example:** `Device# ap name AP44d3.ca52.48b5 priority 1`	Specifies the priority of an access point.
Step 2	**show ap config general** **Example:** `Device# show ap config general`	Displays common information for all access points.
Step 3	**show ap name** *ap-name* **config general** **Example:** `Device# show ap name AP44d3.ca52.48b5 config general`	Displays the configuration of a particular access point.

Overview of Access Point Plug-n-Play

The Plug and Play (PnP) server provides staging parameters to an access point (AP) before it joins a controller. Using this staging configuration, the AP receives the runtime configuration when it joins the controller.

The AP PnP feature enables the PnP server to provide all tag-related information, as part of the preconfigured information to the AP and in turn, to the controller.

You can upload configuration in PNP server in either *TXT* or *JSON* format and also add the AP details. The AP details are then mapped with the details in the *TXT* or *JSON* configuration file. While provisioning AP from PnP server, the AP acquires this configuration details. Based on the configuration details, the AP then joins the corresponding controller with the tag details.

Provisioning AP from PnP Server

You can provision AP from PnP Server in either ways:

- Configure DHCP server or switch with *Option 43*. For example, you can refer to the following code sample:

```
ip dhcp pool vlan10
 network 9.10.10.0 255.255.255.0
 default-router 9.10.10.1
  option 43 ascii 5A1D;B2;K4;|9.10.60.5;J80
```

- Configure DHCP server with DNS. For example, you can refer to the following code sample:

```
ip dhcp pool vlan10
 network 9.10.10.0 255.255.255.0
 default-router 9.10.10.1
 dns-server 9.8.65.5
 domain-name dns.com
```

Verifying AP Tag Configuration

The following example shows how to verify the AP tag configuration:

```
Device# show ap tag summary
Number of APs: 5


AP Name                 AP Mac           Site Tag Name           Policy Tag Name
RF Tag Name             Misconfigured    Tag Source
---------------------------------------------------------------------------------

APd42c.4482.6102        d42c.4482.6102   default-site-tag        default-policy-tag
default-rf-tag          No               Default

AP00c1.64d8.6af0        00c1.64d8.6af0   named-site-tag          named-policy-tag
named-rf-tag            No               AP
```

Note The details in the second row reflect the tag source coming from a PNP server.

Feature History for AP Fallback to Controllers Using AP Priming Profile

This table provides release and related information for the feature explained in this module.

Table 1: Feature History for AP Fallback to Controllers Using AP Priming Profile

Release	Feature	Feature Information
Cisco IOS XE Cupertino 17.9.2	AP Fallback to Controllers Using AP Priming Profile	This feature helps to configure primary, secondary, and tertiary controllers for a group of APs matching regular expression or for an individual AP using priming profiles.

Information About AP Fallback to Controllers Using AP Priming Profile

In large networks, accessing every AP console and configuring AP priming for primary, secondary, and tertiary controllers are not easy tasks. The AP Fallback to Controllers Using AP Priming Profile feature allows you to simplify the task of priming APs by using profiles defined in the controller.

Using the AP priming profile under the AP filter profile, you can configure primary, secondary, and tertiary controllers for a group of APs matching regular expressions, or for an individual AP using AP Ethernet MAC. When the AP joins the controller, the AP priming configuration gets pushed to the AP depending on whether priming override is enabled or not.

Note When the controller sends a priming profile to the AP, the AP disconnects from the current controller and joins the controller in the priming profile. A CAPWAP restart or device reboot is not required.

Restrictions for AP Fallback to Controllers Using AP Priming Profile

- Rolling AP upgrade will not work if priming override is enabled.
- The maximum number of priming profiles permitted is 128. The length of each profile can be up to 32 ASCII characters.

Configure AP Priming Profile

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**wireless profile ap priming** *profile-name* **Example:** `Device(config)# wireless profile ap priming Prime-FX`	Configures the profile to prime APs.
Step 3	**primary** *controller-name ip-address* **Example:** `Device(config-priming)# primary aaaa 209.165.201.2`	Configures name and IP address of the primary controller for AP fallback.
Step 4	**secondary** *controller-name ip-address* **Example:** `Device(config-priming)# secondary bbbb 209.165.201.3`	Configures name and IP address of the secondary controller for AP fallback.
Step 5	**tertiary** *controller-name ip-address* **Example:** `Device(config-priming)# tertiary bbbb 209.165.201.4`	Configures name and IP address of the tertiary controller for AP fallback.
Step 6	**priming-override** **Example:** `Device(config-priming)# priming-override`	Sends the priming details to the AP. Priming override is disabled by default. When disabled, information stored in the AP priming profile is not sent to the APs. . **Note** N+1 upgrade may not work as expected when priming override is enabled. Before using N+1 upgrade, ensure that priming override is disabled using the **no priming-override** command.

Configure AP Priming Using Filters

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**ap filter name** *filter-name* **type priming** **Example:** `Device(config)# ap filter name test-filter type priming`	Configures the AP filter and sets the type as priming. Ensure that you set type as priming because the default filter type is tag. **Note** The existing filter type cannot be modified unless the filter is deleted and created with a different type. Use the **no ap filter name** command to delete a filter.
Step 3	**ap name-regex** *reg-ex* **Example:** `Device(config-ap-pr-filter)# ap name-regex BGL18`	Configures the AP name regular expression match.
Step 4	**profile** *profile-name* **Example:** `Device(config-ap-pr-filter)# profile Prime-FX`	Maps the priming profile to the filter.
Step 5	**exit** **Example:** `Device(config-ap-pr-filter)# exit`	Returns to global configuration.
Step 6	**ap filter priority** *priority* **filter-name** *filter-name* **Example:** `Device(config)# ap filter priority 12 filter-name test-filter`	Configures priority for a named AP filter. You can configure multiple AP priming profiles with unique priority levels. This allows you to set different priority levels for each AP priming profile.

Configure Per-AP Priming

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**ap** *mac-address* **Example:** `Device(config)# ap 00:00:5e:00:53:af`	Enters AP profile configuration mode.
Step 3	**priming** *profile-name* **Example:** `Device(config-ap-tag)# priming Prime-FX`	Maps a priming profile to an AP.

Verify the Configuration

To view the list of all the priming filters, use the following command:

```
Device# show ap filters all type priming

Filter Name                        regex                              Priming profile
-----------------------------------------------------------------------------------------
FLR1                                *AP-FLOOR-1*                      AP-PRIMING-1

FLR2                                *AP-FLOOR-2*                      AP-PRIMING-2
```

To view the list of all the active priming filters, use the following command:

```
Device# show ap filters active type priming

Priority   Filter Name              regex                            Priming profile

-----------------------------------------------------------------------------------------

 0          FLR2                    *AP-FLOOR-2*                     AP-PRIMING-2

 1          FLR1                    *AP-FLOOR-1*                     AP-PRIMING-1
```

To view the summary of the priming profiles, use the following command:

```
Device# show wireless profile ap priming summary

Number of AP Priming Profiles: 2
Priming profile
-------------------
AP-PRIMING-1
AP-PRIMING-2
```

To view the details of the priming profiles, use the following command:

```
Device# show wireless profile ap priming all

Profile Name  Primary Controller Name  Primary Controller IP  Secondary Controller Name
Secondary Controller IP  Tertiary Controller Name  Tertiary Controller IP  Override
-----------------------------------------------------------------------------------------------------------------------------------
AP-PRIMING-1  BGL18-wlc                209.165.201.1          BGL17-wlc
209.165.201.2                                      0.0.0.0                Disabled
AP-PRIMING-2  BGL18-wlc                209.165.201.2          BGL17-wlc
209.165.201.2            BGL12-wlc                 209.165.201.3          Disabled
```

To view the priming information for each AP, use the following command:

```
Device# show ap ap1 config general | sec Priming

Priming Profile                   : AP-PRIMING-1
Priming Override                  : Disabled
Priming Source                    : MAC/FILTER/NONE
Filter Name                       : FLR1
```