



## N+1 Hitless Rolling AP Upgrade

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## N+1 Hitless Rolling AP Upgrade

The existing CAPWAP implementation on the Cisco Catalyst 9800 Series Wireless Controller requires that the controller and all its associated APs have the same software version. It is possible to upgrade a set of APs using the N+1 Hitless Rolling AP Upgrade feature. However, all the APs cannot be upgraded at the same time without network downtime.

You can upgrade wireless networks without network downtime when the same version skew is supported between the controller and the APs. This enables the APs to be upgraded in a staggered manner, while still being connected to the same controller. The version skew method can avoid upgrade downtime even for N+1 networks by using N+1 Hitless Rolling AP Upgrade feature and a spare controller.

The following is the workflow for the N+1 Hitless Rolling AP Upgrade feature:

1. Establish a mobility tunnel from the controller (WLC1) to a mobility member (WLC2).
2. Upgrade the controller software (WLC1) using the command **install add file bootflash:new\_version.bin**.
3. Optionally, you can also upgrade the AP image. For more information, see [Predownloading an Image to an Access Point](#) chapter.
4. Use the **ap image upgrade destination controller-name controller-ip report-name** privileged EXEC command to upgrade and move all the APs from WLC1 (source) to WLC2 (destination).
5. Activate the new image in WLC1 using the **install activate** command.
6. Commit the changes using the **install commit** command.
7. Move the APs back to WLC1 from WLC2 using the **ap image move destination controller-name controller-ip report-name** command.



**Note** The **ap image upgrade destination** command does not work without an image pre-download. If you do not perform an image pre-download, use the **ap image move** command to move the APs. When APs download the image and join the destination controller, you must set the iteration time as high. Also, you can customize the iteration time by configuring the **ap upgrade staggered iteration timeout** command.

## Configuring Hitless Upgrade

Follow the procedure given below to achieve a zero downtime network upgrade in an N+1 deployment.

### Before you begin

- Ensure that the hostname and wireless management IP of the destination controller is provided in the privileged EXEC command.
- Ensure that access points are predownloaded with the image running on the destination controller.

### Procedure

|               | Command or Action  | Purpose   |
|---------------|--|---|
| <b>Step 1</b> | <b>ap image upgrade destination</b> <i>wlc-name</i><br><i>wlc-ip</i><br><b>Example:</b><br>Device# ap image upgrade destination wlc2<br>10.7.8.9 | Moves APs to the specified destination controller with the swap and reset command. After this, the parent controller activates new image, and reloads with the new image. After the mobility tunnel comes up, APs are moved back to the parent controller without a swap and reset.<br><b>Note</b> Ensure that you establish a mobility tunnel from controller (WLC1) to a mobility member (WLC2) before image upgrade. |
| <b>Step 2</b> | <b>ap image upgrade destination</b> <i>wlc-name</i><br><i>wlc-ip</i><br><b>Example:</b><br>Device# ap image upgrade destination wlc2<br>10.7.8.9 | (Optional) Moves APs to the specified destination controller with a swap and reset command.<br><b>Note</b> Perform Steps 2 to 4 only if you are not performing Step 1.  |
| <b>Step 3</b> | <b>ap image move destination</b> <i>wlc-name wlc-ip</i><br><b>Example:</b><br>Device# ap image move destination wlc1<br>10.7.8.6                 | Move the APs back to the parent controller.   |
| <b>Step 4</b> | <b>ap image upgrade destination</b> <i>wlc-name wlc-ip</i> [fallback]  | (Optional) Moves APs to the specified destination controller with a swap and reset command. After that, APs are moved back to   |

|               | Command or Action  | Purpose   |
|---------------|--|---|
|               | <b>Example:</b><br>Device# ap image upgrade destination wlc2 10.7.8.9 fallback   | the parent controller (without a swap and reset) after manual install activate of the new image and reloading of the parent controller.   |
| <b>Step 5</b> | <b>ap image upgrade destination wlc-name wlc-ip [reset]</b><br><b>Example:</b><br>Device# ap image upgrade destination wlc2 10.7.8.9 reset | (Optional) Moves APs to the specified destination controller with a swap and reset command. After this, the parent controller activates the new image and reloads with the new image. |

## Verifying Hitless Upgrade

Use the following **show** commands to verify hitless upgrade.

To view all the upgrade report names, use the following command:

```
Device# show ap upgrade summary
```

```
Report Name      Start time
```

```
-----
AP_upgrade_from_VIGK_CSR_2042018171639 05/20/2018 17:16:39 UTC
```

To view AP upgrade information based on the upgrade report name, use the following command:

```
Device# show ap upgrade name test-report
```

```
AP upgrade is complete
From version: 16.10.1.4
To version: 16.10.1.4
Started at: 05/20/2018 17:16:39 UTC
Percentage complete: 100
End time: 05/20/2018 17:25:39 UTC
Progress Report
-----
Iterations
-----
Iteration Start time End time AP count
-----
0 05/20/2018 17:16:39 UTC 05/20/2018 17:16:39 UTC 0
1 05/20/2018 17:16:39 UTC 05/20/2018 17:25:39 UTC 1
Upgraded
-----
Number of APs: 1
AP Name Ethernet MAC Iteration Status
-----
AP-SIDD-CLICK 70db.9848.8f60 1 Joined
In Progress
-----
Number of APs: 0
AP Name Ethernet MAC
-----
Remaining
-----
Number of APs: 0
AP Name Ethernet MAC
-----
```

