

Cisco Application Centric Infrastructure

Upgrading Your ACI Fabric

Cisco ACI allows users to upgrade an entire data center fabric from one location. This guide will briefly describe the nuts and bolts of the process.

Pre-Work

- 1. Create a backup** of your ACI fabric prior to upgrading. It's recommended that you generate a backup of your ACI fabric configuration both BEFORE and AFTER an ACI fabric upgrade. The rule of thumb is to always have a backup based on your current running version of code.
- 2.** Always make sure that all of your APICs are in a Fully Fit state prior to any upgrades. Never kick-off an upgrade unless all APICs are in a Fully Fit state.
- 3.** Review the Cisco [APIC Upgrade/Downgrade Guide](#). This guide is comprehensive and covers which versions you can upgrade/downgrade to and from, guidelines, and suggested maintenance group configuration.
- 4.** Determine which version of code is best for you and your ACI Fabric. If you have questions on what version of code you should target, check out this post on [ACI / APIC Software Guidance](#) for a quick reference guide.
- 5.** Check out this [APIC Code Page](#), a great place to find out the long-lived ACI releases and supported CIMC images.
- 6. Check Release Notes** for your intended version. It's always smart to check the release notes for any bugs, limitations, or version specific notes BEFORE you upgrade.
 - [APIC 2.2\(4\) Release Notes](#)
 - [APIC 3.2\(3\) Release Notes](#)
 - [APIC 4.0\(1\) Release Notes](#)
- 7. Download the code** from Cisco.com. You'll need two files: the ISO file for your APIC Cluster and the BIN file for your switches. (One BIN file will work for both Spines and Leafs).
- 8.** Check your CIMC code and ensure you are running supported code on your CIMC.

ACI Upgrade Notables

- In an ACI Multi-Pod environment, it is recommended to have separate maintenance groups per pod.
 - Switches in different pods can only be upgraded serially, regardless of whether they are in the same maintenance group. The switches cannot be upgraded in parallel.
- For your BGP-RRs (your spines) in each pod, make sure you always have one BGP-RR available during the upgrade process. In other words, don't place both all of your BGP-RR spines in the same maintenance group. This is especially true when performing an ACI fabric upgrade for Multi-Pod deployments.
 - *Note – This is referring to the “Route Reflector Nodes” under the BGP RR configuration.*

How Long Will the Upgrade Take?

While there's no set time for the upgrade, here are some guidelines that can help. The following times are approximate.

- CIMC = 45-60 minutes per CIMC/APIC (might not be required)
- APICs = 30-45 minutes for the APIC cluster
- Switch Maintenance Groups = 15-30 minutes per Maintenance Group

If you have an APIC cluster of three APICs, and four maintenance groups in a single pod ACI Fabric, you'll be looking at anywhere from 1 hour, 30 minutes to 2 hours, 45 minutes.

Upgrading Your Fabric

Now that your pre-work is complete, you can move on to the actual upgrade.

Copy the ISO and BIN Files to the APIC

There are several ways to get files from CCO onto your APIC fabric.

- 1.** SCP the files to the APIC.
- 2.** Upload the files via the GUI.

While you can upload from the GUI, it's preferable to use SCP to transfer the files to the APIC. It's recommended that you're able to see the byte counts offered via SCP as opposed to the ominous transfer bar in the GUI.

Option 1 – SCP the Files to Your APIC.

- Note: “Admin” is the sample username we are using for the APIC.
- The IP address field is the IP of one of your APICs from your APIC cluster. (You only need to upload the files to one APIC).
- Don’t forget the colon “:” between the IP/ServerName and the directory.
- New to SCP? Check out this [helpful link](#).

1. Copy ISO file for APICs - `scp filename.iso admin@10.18.188.101:/tmp/.`

2. Copy BIN file for Switches - `scp filename.bin admin@10.18.188.101:/tmp/.`

Add the Files to the APIC Firmware Repository

1. Log in to APIC and add firmware to firmware repository.

1. SSH to the APIC

2. `apic1# bash`

3. `apic1# cd /tmp`

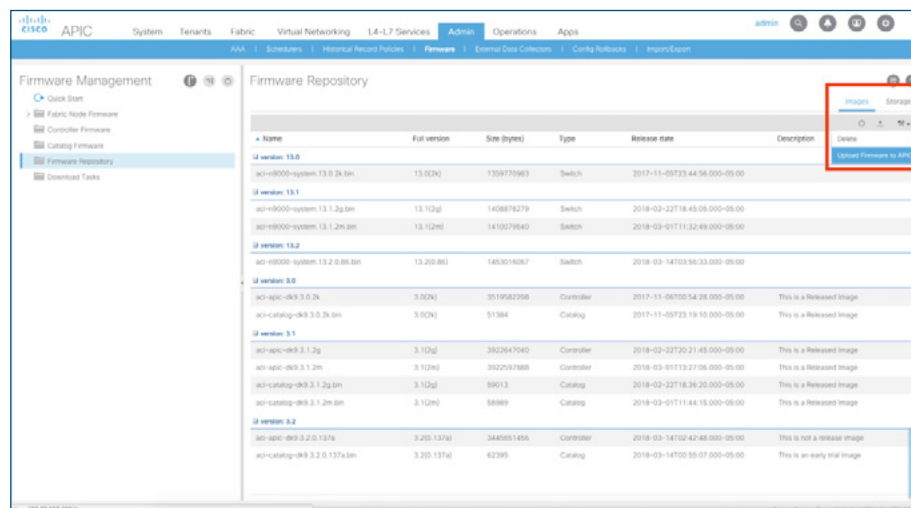
4. `apic1# firmware add filename.ISO` << go get a coff ee. This will take 3-5 mins

5. `apic1# firmware add filename.BIN` << stir your coff ee. This will take 1-2 mins

Option 2 – Upload the Files Via the GUI

1. Upload ISO file for APICs.

2. Upload BIN file for Switches.



Admin > Firmware > Firmware Repository > Actions Button > Upload Firmware to APIC

Verify the Firmware is Present in the APIC Firmware Repository

1. Verify Firmware is in Firmware Repository on the APIC

1. Admin > Firmware > Firmware Repository

Name	Full version	Size (bytes)	Type	Release date	Description
4.0 version: 13.0					
aci-rs000-system, 13.0.2k.bin	13.0(2k)	1358770983	Switch	2017-11-09T23:44:56.000-05:00	
4.0 version: 13.1					
aci-rs000-system, 13.1.2p.bin	13.1(2p)	1408876279	Switch	2018-02-22T18:49:08.000-05:00	
aci-rs000-system, 13.1.2m.bin	13.1(2m)	1410076640	Switch	2018-03-01T11:32:48.000-05:00	
4.0 version: 13.2					
aci-rs000-system, 13.2.0.88.bin	13.2(0.88)	1453216067	Switch	2018-03-14T03:56:33.000-05:00	
4.0 version: 3.0					
aci-apic-rs0 3.0.2k	3.0(2k)	3519502208	Controller	2017-11-08T00:54:28.000-05:00	This is a Released Image
aci-catalog-rs0 3.0.2k.bin	3.0(2k)	51384	Catalog	2017-11-09T23:19:10.000-05:00	This is a Released Image
4.0 version: 3.1					
aci-apic-rs0 3.1.2p	3.1(2p)	3822847545	Controller	2018-02-22T20:21:49.000-05:00	This is a Released Image
aci-apic-rs0 3.1.2m	3.1(2m)	3827597888	Controller	2018-03-01T11:27:08.000-05:00	This is a Released Image
aci-catalog-rs0 3.1.2p.bin	3.1(2p)	89013	Catalog	2018-02-22T18:36:20.000-05:00	This is a Released Image
aci-catalog-rs0 3.1.2m.bin	3.1(2m)	58989	Catalog	2018-03-01T11:44:18.000-05:00	This is a Released Image
4.0 version: 3.2					
aci-apic-rs0 3.2.0.137a	3.2(0.137a)	3445051406	Controller	2018-03-14T02:42:46.000-05:00	This is not a release image
aci-catalog-rs0 3.2.0.137a.bin	3.2(0.137a)	62395	Catalog	2018-03-14T00:55:07.000-05:00	This is an early trial image

Admin > Firmware > Firmware Repository

Upgrade the Fabric

1. Upgrade the APIC Controllers.

1. Admin > Firmware > Controller Firmware
2. Click Action button > Upgrade Controllers
 1. Set target firmware version and select Upgrade Now option.
 2. Click Submit.

2. Upgrade your ACI Fabric Switches.

1. Set proper Firmware Group.
 1. Admin > Firmware > Fabric Node Firmware > Firmware Groups >
 2. Use existing firmware group or create new.
 3. Firmware Groups are used to determine which software version our switches will use. It is normal for all switches to use the same firmware version.
2. Go to Maintenance Groups and upgrade one maintenance group at a time.
 1. Admin > Firmware > Fabric Node Firmware > Maintenance Groups
 2. Maintenance groups allow an ACI admin to divide their switches based on even/odds, function-type (compute leafs, service leafs, border leafs), etc, and upgrade just those switches at a given time. Check out the examples from the CCO Upgrade/Downgrade link of how you can create your maintenance groups.
 1. Two-group method
 1. Divide your switches into two groups: a red group and a blue group. Put one half of the spine switches in the red group, and the other half in the blue group. Also, put one half of the leaf switches in the red group and the other half in the blue group.

2. Upgrade the red group.
 3. After the red group upgrade is complete, confirm that the fabric is healthy.
 4. Upgrade the blue group.
- 2. Four-group method**
1. Divide your switches into four groups: a red spine switches group, a blue spine switches group, a red leaf switches group, and a blue leaf switches group. Put one half of the spine switches in the red spine switches group, and the other half of the spine switches in the blue spine switches group. Then, place half the leaf switches in the red leaf switches group, and the other half in the blue leaf switches group.
 2. Upgrade the red leaf switches group.
 3. After the red leaf switches group upgrade is complete, confirm that the fabric is healthy.
 4. Upgrade the blue leaf switches group.
 5. After the blue leaf switches group upgrade is complete, confirm that the fabric is healthy.
 6. Upgrade the red spine switches group.
 7. After the red spine switches group upgrade is complete, confirm that the fabric is healthy.
 8. Upgrade the blue spine switches group.