

Convert from NX-OS to ACI boot mode and from ACI boot mode back to NX-OS

This chapter describes how to convert a Nexus 9000 Series switch from NX-OS to Application Centric Infrastructure (ACI) boot mode.

Note If you need to convert the mode of operation from NX-OS to ACI and the NX-OS switch model has only 16G memory, then the switch requires an RAM memory upgrade to support the ACI mode. For more information about upgrading the RAM of such switches, refer to Adding an 8, 16, or 32 Gigabyte DIMM to a Cisco Nexus 9000 Series Switch.

The sections of this chapter include:

- Convert a Nexus 9000 Series switch from NX-OS to ACI boot mode, on page 1
- Convert a replacement standby supervisor to ACI boot mode, on page 3
- Convert a Nexus 9000 Series switch back to NX-OS, on page 4

Convert a Nexus 9000 Series switch from NX-OS to ACI boot mode

You can convert any Nexus 9000 Series switch from NX-OS to Application Centric Infrastructure (ACI) boot mode.

Note When converting any switch from NX-OS (standalone) to ACI boot mode, you can delete the NX-OS image from the bootflash to save space.

Before you begin

The prerequisites to convert to ACI boot mode include:

- Verify whether your switch hardware is supported in ACI boot mode by checking the *Supported Hardware* section of the Release Notes for Nexus 9000 Series ACI-Mode Switches. For example, line cards are not compatible between NX-OS and ACI boot mode.

- Remove or turn off any unsupported modules (using the **poweroff module** *module* command). Otherwise, the software uses a recovery and retry mechanism before it powers down the unsupported modules. This can cause delays in the conversion process.
- For dual-supervisor systems, use the **show module** command to make sure that the standby supervisor module is in the ha-standby state.
- Verify that the Application Policy Infrastructure Controller (APIC) is running Release 1.0(2j) or a later release.
- Make sure that the ACI image is 11.0(2*x*) or a later release.
- Use the **show install all impact epld** *epld-image-name* command to verify that the switch does not require any EPLD image upgrades. If any upgrades are required, follow the instructions in the Nexus 9000 Series FPGA/EPLD Upgrade Release Notes.

Procedure

Step 1 Verify that the switch is running the latest release.

Example:

```
switch(config)# show version
```

NX-OS file names begin with `nxos`.

Step 2 Copy the ACI image from the APIC:

a) Set the IP address on the mgmt0 interface of the switch to allow connectivity between this interface and the APIC.

b) Enable Secure Copy Protocol (SCP) services on the switch.

Example:

```
switch(config)# feature scp-server
```

c) From the APIC command line interface, use SCP to copy the firmware image from the APIC to the active supervisor module on the switch.

Example:

```
admin@apic1:aci> scp -r /firmware/fwrepos/fwrepo/switch-image-name
admin@switch-ip-address:switch-image-name
```

d) For dual supervisor systems, copy the ACI image to the standby supervisor module.

Example:

```
switch(config)# copy bootflash:aci-image bootflash://sup-standby/
```

Step 3 Follow these steps to boot to the ACI image:

a) Configure the switch to not boot from NX-OS.

Example:

```
switch(config)# no boot nxos
```

b) Save the configuration.

Example:

```
switch(config)# copy running-config startup-config
```

Note
You must run the **copy running-config startup-config** command prior to booting the ACI image. Do not run it after you enter the **boot aci** command.

c) Boot the active and standby supervisor modules with the ACI image.

Example:

```
switch(config)# boot aci bootflash:aci-image-name
```

Caution
Do not enter the **copy running-config startup-config** command after the **boot aci** command. If you do, the switch goes to the loader> prompt.

d) Verify the integrity of the file by displaying the MD5 checksum.

Example:

```
switch(config)# show file bootflash:aci-image-name md5sum
```

e) Reload the switch.

Example:

```
switch(config)# reload
```

f) Log in to the switch as an administrator.

Example:

```
Login: admin
```

Step 4 Verify whether you must install certificates for your device.

Example:

```
admin@apic1:aci> openssl asn1parse -in /securedata/ssl/server.crt
```

Look for PRINTABLESTRING in the command output. If `Manufacturing CA` is listed, the correct certificates are installed. If something else is listed, contact TAC to generate and install the correct certificates for your device.

Note
You might need to install certificates for Nexus 9000 Series switches that were shipped prior to May 2014.

To run this command, contact TAC.

What to do next

Refer to the ACI and APIC documentation to configure and operate the switch in ACI mode: https://www.cisco.com/c/en/us/support/cloud-systems-management/application-policy-infrastructure-controller-apic/tsd-products-support-series-home.html.

Convert a replacement standby supervisor to ACI boot mode

If you ever need to replace the standby supervisor module in a dual-supervisor system, you will need to copy and boot the Application Centric Infrastructure (ACI) image for use with the replacement standby supervisor.

Before you begin

Copy the ACI image to a USB drive.

Procedure

Step 1 Reload the switch.

Example:

```
switch# reload
```

Step 2 Enter a break sequence (Ctrl-C or Ctrl-]) during the initial boot sequence to access the loader> prompt.

Example:

```
Ctrl-C
loader>
```

Step 3 Plug the USB drive containing the ACI image into the standby supervisor USB slot.

Step 4 Boot the ACI image.

Example:

```
loader> boot usb#:aci-image-name
```

Note
If you have two USB drives, enter the **dir** command to see which drive contains the ACI image. Then specify either **usb1** or **usb2** in the **boot** command.

Step 5 Log in to the switch as an administrator.

```
Login: admin
```

Step 6 Copy the ACI image from the USB drive to the switch.

Example:

```
switch# copy usb#:aci-image-name bootflash:aci-image-name
```

Convert a Nexus 9000 Series switch back to NX-OS

You can convert a Nexus 9000 Series switch from Application Centric Infrastructure (ACI) boot mode back to NX-OS.

Note When converting any switch from ACI to NX-OS (standalone) boot mode, you can delete the ACI image from the bootflash to save space.

Procedure

Step 1 Reload the switch.

Example:

```
switch# reload
```

Step 2 During the initial boot sequence, enter a break sequence (Ctrl-C or Ctrl-]) to access the loader> prompt.

Example:

```
Ctrl-C
loader>
```

Step 3 Configure the boot process to stop at the boot prompt.

Example:

```
loader> cmdline recoverymode=1
```

Step 4 Boot the active supervisor module with the NX-OS image.

Example:

```
loader> boot nxos.9.2.3.bin
```

Note
If the NX-OS image that is mentioned in the boot variable is not present in the bootflash, the system falls back to the loader prompt during the boot sequence. To recover the switch from the loader prompt, boot the system through a different image present in the bootflash, perform a **tftpboot** , or boot through a USB device.

Note
For some NX-OS releases and Nexus 9000 Series switches, a sample error message that appears is

```
!!Fatal error!!
Can't reserve space for RPM repo
Please free up bootflash space and reboot
```

If you see this error message, start over from Step 1. After Step 3, enter the **cmdline init_system** command and then go to Step 4. The switch boots into the normal NX-OS prompt and skips the switch(boot)# prompt.

Step 5 Restore the switch file system partitioning to the default settings. The bootflash filesystem is reset to NX-OS partitioning, and the NX-OS image is deleted.

Example:

```
switch(boot)# init system
```

Step 6 Complete the upload of the NX-OS image file.

Example:

```
switch(boot)# load-nxos
```

Note
For some Nexus 9000 Series switches, the device does not load with the normal NX-OS prompt (switch#) and instead comes up as `bash-4.2#`. In this case, you must power cycle the device, jump to loader, and boot the NX-OS image using either TFTP or a USB method.

- For the TFTP method - First assign an IP address and gateway to the device using the **set ip***ip addresssubnet mask* and the **set gw***gateway address* commands. This is required as the **init system** command in the above step erases all available configurations on the device

  Example

  ```
  loader> set ip 192.0.2.10 255.255.255.0
  loader> set gw 192.0.2.1
  ```

  Then use the **tftp** command to load the image.

  ```
  loader> boot tftp://<tftp server ip>/<nxos-image-name>
  ```

- For the USB method - Mount the USB on the switch and execute the **dir** command on the loader to see the contents of the bootflash folder and the USB device.

  Example

  ```
  loader > dir
  usb1::
  lost+found
  /nxos.9.x.y.bin
  ```

  Then boot the NX-OS image using the following command:

  ```
  loader> boot usb1:/nxos-image
  Example: boot usb1:/nxos.9.x.y.bin
  ```

After you boot the NX-OS image, the device loads as a NX-OS switch and you can continue with the remaining steps.

Step 7 Copy the NX-OS image into the bootflash: and set the appropriate boot variables to ensure that the system boots the NX-OS image on the next reload.

Example:

TFTP example:

```
switch# copy tftp://tftp-server-ip/nxos-image-namebootflash:

switch# configure terminal

switch(config)# boot nxos bootflash:nxos-image-name

switch(config)# copy running-config startup-config
switch(config)# end
```

USB example:

```
switch# copy usb1:nxos-image-namebootflash:

switch# configure terminal
switch(config)# boot nxos bootflash:nxos-image-name
switch(config)# copy running-config startup-config
switch(config)# end
```

Step 8 Wait for the system controllers to come up (approximately 15–20 minutes).

File system differences between ACI and NX-OS require one-time reformatting change during the ACI to NX-OS conversion. Subsequent reloads with the NX-OS image are faster.

Step 9 Verify that the active supervisor module and the system controllers are in the active state.

Example:

```
switch# show module
```

Note

- For dual-supervisor systems, follow Steps 3–6 on the standby supervisor.
- Log in to the switch and verify that it is running NX-OS software.

Load NX-OS image into bootflash using SCP on the ACI shell

If you have a Nexus 9000 Series Switch in ACI mode and must convert it to NX-OS mode but are unable to perform a TFTP boot and physical access to USB is not available, then Secure Copy Protocol (SCP) can be used on the ACI Shell to load a NX-OS Image into the bootflash. Contact TAC for further information about the process, as this requires root access.