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Cisco Nexus Hyperfabric — Converting the Operating System of Cisco N9000-Series Switches

Converting the operating system of Cisco N9000-series switches

To manage a Cisco N9000-series switch with the Cisco Nexus Hyperfabric cloud controller, you must convert the switch's software to the Nexus Hyperfabric operating system. Likewise, if you no longer want to manage an N9000 switch with Nexus Hyperfabric, you can convert the switch's software back to NX-OS.

Supported Cisco N9000-series switches for conversion

You can convert these switches to or from the Cisco Nexus Hyperfabric operating system:

- Cisco N93108TC-FX3
- Cisco N9164E-NS4-O

Supported Cisco N9000-series switch operating system conversion paths

This table specifies the supported paths for converting between Cisco N9000-series switch operating systems.

Table 1: Supported Cisco N9000-series switch operating system conversion paths

From \ To	NX-OS	ACI	Nexus Hyperfabric
NX-OS	Upgrade/downgrade	Direct conversion	Direct conversion
ACI	Direct conversion	Upgrade/Downgrade	ACI → NX-OS → Nexus Hyperfabric
Nexus Hyperfabric	Direct conversion	Nexus Hyperfabric → NX-OS → ACI	Upgrade/downgrade

Convert from NX-OS to the Nexus Hyperfabric operating system

Make sure you meet this requirement before converting a switch's operating system:

- The switch must have NX-OS version 10.5(1) or later and you can only use Bash commands, which is documented in this procedure.
- The switch needs connectivity to hyperfabric.cisco.com. Although you can skip the connectivity check during conversion, we recommend that you configure the switch's management IP address, gateway IP address, and DNS server address so that the switch can reach hyperfabric.cisco.com. If your management network requires a proxy, you can set the proxy server address as part of the conversion.

This example shows the management IP address configured in NX-OS:

```
interface mgmt0
  vrf member management
  ip address 192.168.1.11/24
```

This example shows the gateway IP address and DNS server address configured in NX-OS:

```
vrf context management
  ip route 0.0.0.0/0 192.168.1.254
  ip name-server 10.1.1.1
```

Follow these steps to convert from NX-OS to the Nexus Hyperfabric operating system.

Step 1 Connect to the switch using Telnet, SSH, or the serial console.

For Telnet, follow these substeps.

a) Connect using either the hostname or IP address of the switch.

```
host$ telnet {hostname | ip_address} port
```

b) At the switch login prompt, enter your username and password.

If the switch does not have a password configured, press **Enter**.

For SSH, follow these substeps.

a) Connect using either the hostname or IP address of the switch and optionally specify the port and username.

```
host$ ssh [-D port] [{user@} hostname | ip_address]
```

b) At the switch login prompt, enter your username and password.

If the switch does not have a password configured, press **Enter**.

For the serial console, see the "[Configuring Terminal Settings and Sessions](#)" chapter of the *Cisco N9000 Series NX-OS Fundamentals Configuration Guide* for information and procedures.

Step 2 See if the Nexus Hyperfabric operating system binary file is already present in the switch's bootflash.

```
switch# ls -lrt /bootflash
```

For example, for the N93108TC-FX3 switch, look for a filename similar to NXOS-to-HFSONIC-N9K-C93108TC-FX3-202505c.1.0.2.bin. The filename must include the product ID of your switch. The exact version number might be different.

If the binary is not present, follow these substeps.

a) Download the Nexus Hyperfabric operating system binary for the switch from the Cisco Software Download page.

The table provides links the download page for each switch. In all cases, download the file that is labeled with "NX-OS to Hyperfabric conversion image", such as "Cisco N9K-C93108TC-FX3 NX-OS to Hyperfabric conversion image".

Table 2: Switch conversion images

Switch PID	Download link
N9K-C93108TC-FX3	Link
N9164E-NS4-O	Link

b) Extract the binary file (.bin) from the tar file.

- c) Copy the binary file to the bootflash.

This example command uses SCP to copy the binary file, but you can use other protocols:

```
switch# copy scp: bootflash:
```

Answer the copy prompts as follows:

- `source filename`: Enter the binary filename.
- `vrf`: Enter the VRF instance where you want to copy the file. If you press **Enter** without specifying a VRF instance name, the copy command uses default.
- `hostname for the scp server`: Enter the hostname or IP address of the SCP server. If you used a different protocol, the **copy** command prompts you as appropriate for the protocol that you used.
- `username`: Enter your username.

Step 3 Convert the operating system to Nexus Hyperfabric.

- a) Start a new Bash session and switch to the root user.

```
switch# configure terminal
switch(config)# feature bash-shell
switch(config)# run bash sudo su
```

- b) Install the binary.

```
bash-4.4# cd /bootflash
bash-4.4# sh binary_filename [--proxy proxy_address --proxy-type type --proxy-user username
--proxy-password password --no-check-connectivity]
```

- `--proxy proxy_address`: Specifies the HTTP/S proxy URL for cloud connectivity.
- `--proxy-type type`: Specifies the proxy protocol type. These are the possible types:
 - http
 - https
 - socks5
- `--proxy-user username`: Specifies the proxy authentication username.
- `--proxy-password password`: Specifies the proxy authentication password.
- `--no-check-connectivity`: Skips the cloud connectivity probe. The conversion process will not begin if the switch does not have connectivity to Nexus Hyperfabric.

The parameters are optional; include only the parameters that you need.

Installing the binary takes about 15 to 20 minutes. After the command verifies the integrity of the binary, the command displays a claim code, which is valid for two hours.

- c) After the installation completes, the switch reboots, then you can use the claim code to claim the device in the Nexus Hyperfabric cloud controller without accessing the switch to get a claim code.

For more information, see [Claim a switch using a claim code](#) in *Cisco Nexus Hyperfabric — Getting Started*.

After you claimed this first switch, you can claim any addition switches without using a claim code. For more information, see [Claim a discovered device without using a claim code](#) in *Cisco Nexus Hyperfabric — Getting Started*.

- d) If the conversion succeeded, update the terminal server configuration accordingly.

You must update the configuration because the default serial console setting on NX-OS switches is different than the serial console setting on Nexus Hyperfabric switches. For information about the required serial console settings, see [Connect the first switch to the Cisco Nexus Hyperfabric cloud service](#) in the *Cisco Nexus Hyperfabric — Getting Started* document.

This configuration example of a terminal server specifies 115200 baud for line 8 for the Nexus Hyperfabric operating system:

```
terminal_server# configure terminal
terminal_server(config)# line 8
terminal_server(config-line)# speed 115200
```

The information in this list applies after the conversion process completes:

- If the conversion succeeds, then the switch will be automatically connected to the Nexus Hyperfabric cloud controller at hyperfabric.cisco.com and the subsequent process will be the same as onboarding a new switch with Nexus Hyperfabric. The conversion preserves the switch's IP address, DNS server address, and proxy address if you configured these things.

If the conversion process fails due to a connectivity issue with the Nexus Hyperfabric cloud controller, the switch reverts back to the NX-OS image.

- During Nexus Hyperfabric operating system conversion, if you abandon the conversion process or if there is a power failure after the cloud probe succeeds, the switch may drop back to the bootloader. In this case, you must copy the NX-OS image to the switch, and then you can boot the switch back in NX-OS mode. For more information about recovering from the bootloader, see "[Recovery from the loader> Prompt](#)" in *Cisco N9000 Series NX-OS Troubleshooting Guide, Release 10.6(x)*. Even though this document is for the 10.6 releases, the procedure is the same for later releases.

Convert from the Nexus Hyperfabric operating system to NX-OS

Before converting a switch's operating system, ensure that you have access to the switch's console menu.

Follow these steps to convert from the Nexus Hyperfabric operating system to NX-OS.

- Step 1** Download an NX-OS image to an SCP server that the switch OOB management interface can access.
- Step 2** Log in to the switch using the serial console, and enter "ttg-admin" as the username.
- Step 3** In the console menu, select **Factory-reset and Reboot Switch**.
- Step 4** Select **Convert to NX-OS**.

The console will prompt for 3 parameters: SCP image location, username, and password. The SCP image location must be a hostname, IPv4 address, or IPv6 address with the full path. In the case, of IPv6, you must enclose the address with [].

Hostname example:

```
myhost.mydomain.com:/path/to/image
```

IPv4 example:

```
192.168.10.1:/path/to/image
```

IPv6 example:

```
[2001:db8::1]:/path/to/image
```

- Step 5** If the conversion succeeded, update the terminal server configuration accordingly.

You must update the configuration because the default serial console setting on Nexus HyperfabricNX-OS switches is different than the serial console setting on NX-OS switches. For information about the required serial console settings, see [Configuring the Console Port](#) in the *Cisco Nexus 9000 Series NX-OS Fundamentals Configuration Guide, Release 10.6(x)*.

This configuration example specifies 9600 baud for line 8 for NX-OS:

```
terminal_server# configure terminal
terminal_server(config)# line 8
terminal_server(config-line)# speed 9600
```