



Cisco Nexus 9000 Series FPGA/EPLD Upgrade Release Notes, Release 6.1(2)I2

Part Number: OL-31603-02
Release Date: June 25, 2014

[Table 1](#) shows the online history changes for this document.

Table 1 **Online History Change**

Part Number	Date	Description
OL-31603-01	March 17, 2014	Created for Cisco NX-OS Release 6.1(2)I2(1).
OL-31603-02	May 7, 2014	Updated for Cisco NX-OS Release 6.1(2)I2(2).
	May 14, 2014	Updated the title for all 6.1(2)I2 releases.
	June 25, 2014	Corrected software image name extension.

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Introduction

The Cisco Nexus 9000 Series switches, which include the Cisco Nexus 93xxx and 95xx switches, contain several programmable logical devices (PLDs) that provide hardware functionalities in all modules. Cisco provides electronic programmable logic device (EPLD) image upgrades to enhance hardware functionality or to resolve known issues. PLDs include electronic programmable logic devices (EPLDs), field programmable gate arrays (FPGAs), and complex programmable logic devices (CPLDs), but they do not include ASICs. In this document, the term EPLD is used for FPGA and CPLDs.

The advantage of having EPLDs for some module functions is that when you need to upgrade those functions, you just upgrade their software images instead of replacing their hardware.


Note

EPLD image upgrades for an I/O module disrupt the traffic going through the module because the module must power down briefly during the upgrade. The system performs EPLD upgrades on one module at a time, so at any one time the upgrade disrupts only the traffic going through one module.

Cisco provides the latest EPLD images with each release. Typically, these images are the same as provided in earlier releases but occasionally some of these images are updated. To determine if there are any updated images, see [Table 2 on page 3](#). These EPLD image updates are not mandatory unless otherwise specified. The EPLD image upgrades are independent from the Cisco NX-OS In Service Software Upgrade (ISSU) process, which upgrades the system and kickstart images with no impact on the network environment.

When Cisco makes an EPLD image upgrade available, these release notes announce their availability, and you can download them from <http://www.cisco.com>.

Deciding When to Upgrade EPLDs

When new EPLD images are available, the upgrades are always recommended if your network environment allows for a maintenance period in which some level of traffic disruption is acceptable. If such a disruption is not acceptable at this time, then you might consider postponing the upgrade until a better time.


Note

The EPLD upgrade operation is a disruptive operation. You should execute this operation only at a programmed maintenance time. The system/kickstart ISSU upgrade is a nondisruptive upgrade.


Note

Do not perform an EPLD upgrade during an ISSU system/kickstart upgrade.

Switch Requirements

The Cisco Nexus 9000 Series switch must be running the Cisco NX-OS operating system and include the following hardware:

- Supervisor modules—one or two, each with at least 200 MB of available bootflash memory (Cisco Nexus 9504 and 9508 only)
- System controller modules—one or two (Cisco Nexus 9504 and 9508 only)

- I/O modules—one to eight (Cisco Nexus 9504 and 9508 only)
- Fabric modules—three or six (Cisco Nexus 9504 and 9508 only)
- Fan tray modules (three)
- Uplink module (Cisco Nexus 93128 and 9396 only)

You must be able to access the switch through a console, SSH, or Telnet.

You must have administrator privileges to work with the Cisco Nexus 9000 Series switch.

EPLDs Available for Releases 6.1(2)I2(1) through 6.1(2)I2(2)

Each EPLD image that you can download from <http://www.cisco.com> is a bundle of EPLD upgrades. To see the updated EPLD versions for the current release, see [Table 2](#).

Table 2 EPLD Upgrades for Cisco NX-OS Releases

Switch Type	Module Type EPLD Device	Module Versions	Release	
			6.1(2)I2(1)	6.1(2)I2(2)
Cisco Nexus 93xxx switches and uplink modules				
Cisco Nexus 93128 switch (N9K-C93128)				
	MI FPGA	All	0x09	—
	IO FPGA	All	0x07	—
Cisco Nexus 9396 switch (N9K-C9396)				
	MI FPGA	All	0x13	—
	IO FPGA	All	0x13	—
12-port optical uplink module (N9K-M12PK)				
	MI FPGA ML	All	0x13	—
Cisco Nexus 95xx switch modules				
Supervisor module (N9K-SUP-A)				
	IO FPGA	All	0x19	—
System controller module (N9K-SC-A)				
	IO FPGA	All	0x16	—
36-port 40-Gbps QSFP+ aggregation I/O module (N9K-X9636PQ)				
	MI FPGA	All	0x09	—
	IO FPGA	All	0x10	—
48-port 1-/10-Gbps SFP+ plus 4-port QSFP+ I/O module (N9K-X9564PX)				
	MI FPGA	All	0x07	—
	IO FPGA	All	0x10	—

Table 2 EPLD Upgrades for Cisco NX-OS Releases (continued)

Switch Type Module Type EPLD Device	Module Versions	Release	
		6.1(2)I2(1)	6.1(2)I2(2)
48-port 1-/10-Gbps BASE-T plus 4-port QSFP+ I/O module (N9K-X9564TX)			
MI FPGA	All	0x04	—
IO FPGA	All	0x08	—
Fabric module for the Cisco Nexus 9504 (N9K-C9504-FM)			
IO FPGA	All	0x18	—
Fabric module for the Cisco Nexus 9508 (N9K-C9508-FM)			
IO FPGA	All	0x18	—



Note

To list the EPLDs running on your switch, use the **show version module *module_number* epld** command. If any of the versions that you list are older than what is listed in Table 2, we recommend that you update the EPLDs.

Determining Whether to Upgrade EPLD Images

You can use the **show install impact epld bootflash:** command to determine whether the EPLDs can be upgraded for all the modules or for specific modules on a switch. This command indicates the current EPLD images, new EPLD images, and whether the upgrades would be disruptive to switch operations.

The following example shows the results of using the **show install impact epld bootflash:** command on a Cisco Nexus 93xxx switch. In this case, the MI FPGA and IO FPGA EPLD images can be upgraded for the switch supervisor (slot 1) and the MI FPGA2 EPLD image can be upgraded for the supervisor in the uplink module (slot 2). Both upgrades are disruptive.

```
switch# show install all impact epld bootflash:n9000-epld.6.1.2.I2.2.img
Compatibility check:
Module      Type           Upgradable      Impact      Reason
-----
1           SUP            Yes             disruptive  Module Upgradable
2           Expansion     Yes             disruptive  Module Upgradable

Retrieving EPLD versions... Please wait.

Images will be upgraded according to following table:
Module  Type      EPLD           Running-Version  New-Version  Upg-Required
-----
1      SUP      MI FPGA        0x10             0x12         Yes
1      SUP      IO FPGA        0x12             0x13         Yes
2      SUP      MI FPGA2       0x12             0x15         Yes
switch#
```

The following example shows the results of using the **show install impact epld bootflash:** command on a Cisco Nexus 95xx switch.

```
switch# show install all impact epld bootflash:n9000-epld.6.1.2.I2.2.img
Compatibility check:
Module      Type      Upgradable      Impact      Reason
-----
2           LC        Yes             disruptive   Module Upgradable
6           LC        No              none         Module is not Online
7           LC        Yes             disruptive   Module Upgradable
22          FM        Yes             disruptive   Module Upgradable
23          FM        Yes             disruptive   Module Upgradable
24          FM        Yes             disruptive   Module Upgradable
25          FM        Yes             disruptive   Module Upgradable
26          FM        Yes             disruptive   Module Upgradable
27          SUP       Yes             disruptive   Module Upgradable
29          SC        Yes             disruptive   Module Upgradable
```

Retrieving EPLD versions... Please wait.

```
Images will be upgraded according to following table:
Module  Type      EPLD      Running-Version  New-Version  Upg-Required
-----
2       LC  MI  FPGA      0x06           0x07         Yes
2       LC  IO  FPGA      0x10           0x10         No
7       LC  MI  FPGA      0x09           0x09         No
7       LC  IO  FPGA      0x14           0x15         Yes
22      FM  IO  FPGA      0x17           0x18         Yes
23      FM  IO  FPGA      0x18           0x18         No
24      FM  IO  FPGA      0x17           0x18         Yes
25      FM  IO  FPGA      0x18           0x18         No
26      FM  IO  FPGA      0x17           0x18         Yes
27      SUP IO  FPGA      0x19           0x19         No
29      SC  IO  FPGA      0x16           0x16         No
```

Downloading the EPLD Images

Before you can prepare the EPLD images for installation, you must download them to the FTP or management server.

To download the EPLD images, follow these steps:

-
- Step 1** From a browser, go to the following URL:
<http://www.cisco.com>
The browser will display the Cisco website.
 - Step 2** From the Products & Services tab, choose **Switches**.
The Switches page opens.
 - Step 3** In the Data Center area, click the arrow next to View Products.
The page lists the Data Center products.
 - Step 4** Click **Nexus 9000**.
The Cisco Nexus 9000 Series Switches page opens.
 - Step 5** In the Support area, click **Download Software**.
The Downloads page opens and lists the Data Center switches.

- Step 6** Choose a Cisco Nexus 9000 Series switch from the list under **Data Center Switches > Cisco Nexus 9000 Series Switches**.
- The Log In page opens.
- Step 7** If you are an existing user, enter your username in the **User Name** field and your password in the **Password** field. If you are a new user, click Register Now and provide the required information before returning to the Log In page and logging in with your new username.
- The Downloads page lists the software types that can be downloaded for the switch that you specified.
- Step 8** Click **NX-OS EPLD Updates**.
- The Downloads page lists software releases that you can download.
- Step 9** Choose **Latest Releases > 6.1(2)I2(2)**.
- The Downloads page displays image information, including a link to the downloadable Tar file, to the right of the releases.
- Step 10** Click the link for the Tar file.
- The Downloads page displays a Download button and lists information for the Tar file.
- Step 11** Click **Download**.
- The Supporting Documents page opens to display the rules for downloading the software.
- Step 12** Read the rules and click **Agree**.
- A File Download dialog box opens to ask if you want to open or save the images file.
- Step 13** Click **Save**.
- The Save As dialog box appears.
- Step 14** Indicate where to save the Tar file and click **Save**.
- The Tar file saves to the location that you specified.
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You are ready to prepare the EPLD images for Installation (see the [“.” section on page 7](#)).

Installation Guidelines

You can upgrade EPLDs using CLI commands on the Cisco Nexus 9000 Series switch. Follow these guidelines when you upgrade EPLDs:

- Before you upgrade any EPLD images, be sure that you have updated the Cisco NX-OS operating system to the level required for the images and be sure that you have an EPLD image file.
- You can execute an upgrade from the active supervisor module only. This upgrade is for one or all of the modules as follows:
 - You can upgrade a module individually.
 - You can upgrade all modules sequentially.
 - You can upgrade all modules in parallel.
- You can update the images for one or all modules whether the switch is online or offline as follows:
 - If the modules are online, only the EPLD images with version numbers that differ from the new EPLD images are upgraded.

- If the modules are offline, all of the EPLD images are upgraded.
- On a Cisco Nexus 95xx switch that has two supervisor modules, upgrade the EPLDs for the standby supervisor and then switch the active supervisor to the standby mode to upgrade its EPLDs (the supervisor switchover is not disruptive to traffic on Cisco Nexus 95xx switches). On a switch that has only one supervisor module, you can upgrade the active supervisor, but this will disrupt its operations during the upgrade.
- If you interrupt an upgrade, you must upgrade the module that is being upgraded again.
- The upgrade process disrupts traffic on the targeted module.
- Do not insert or remove any modules while an EPLD upgrade is in progress.

Upgrading the EPLD Images

If you have a Cisco Nexus 9000 Series switch that is running Cisco NX-OS Release 6.1(2)I2(1) build 6.1(2)I2(0.206) or any earlier build of 6.1(2)I2(0.xxx), follow the special upgrade steps presented here.



Note

If you have a Cisco Nexus 9508 switch that is running the n9000-dk9.6.1.2.I1.1.bin image from November 18, 2013, you do not need to enter the **write erase** command in Step 5. We do recommend upgrading EPLD images, but it is not mandatory.

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- Step 1** Copy the n9000-dk9.6.1.2.I2.1.bin image to bootflash.
- Step 2** Change the boot variables to the NX-OS image by entering the following commands:
- ```
switch# configure terminal
switch (config)# boot nxos bootflash:n9000-dk9.6.1.2.I2.2.bin
Cisco Nexus 9000 Series NX-OS Release Notes, Release 6.1(2)I1(2)
```
- Step 3** Enter the **copy running-config startup-config** command to set the startup boot variables to the NX-OS image.
- Step 4** Copy the running-configuration file to a backup-configuration file to ensure that you load the running configuration after you make the upgrade.
- Step 5** Enter the **write erase** command. The boot variables remain set. Enter the **reload** command.  
On a Cisco Nexus 9508 or 9504 switch with dual supervisors, an “Autocopy in progress” message appears when you enter the **reload** command. Enter **No** and wait for the auto copy operation to finish.
- Step 6** Enter the **install all nxos bootflash:n9000-dk9.6.1.2.I2.2.bin** command to upgrade the BIOS. Do not reboot the chassis.
- Step 7** Enter the **install epld bootflash:n9000-epld.6.1.2.I2.2.img module all** command to upgrade the EPLD. The chassis will reboot automatically.
- Step 8** Enter the **install epld bootflash:n9000-epld.6.1.2.I2.2.img module all golden** command to upgrade the golden EPLD. The chassis will reboot automatically.
- Step 9** Restore the configuration that you saved in Step 4 from the bootflash. If this is a fresh install or upgrade, you do not need to restore the previous running configuration.

## Verifying the EPLD Upgrades

You can verify the EPLD upgrades for each slot in the switch by using the commands listed in [Table 3](#).

**Table 3** *Commands Used to Display EPLD Information for Modules*

| Command                                           | Modules Verified           |
|---------------------------------------------------|----------------------------|
| <code>show version module slot_number epld</code> | I/O and supervisor modules |

## Displaying the Status of EPLD Upgrades

To display the status of EPLD upgrades on the switch, use the `show install epld status` command as shown in [Example 1](#).

**Example 1** *Displaying EPLD Upgrades*

```
switch# show install epld status
```

## Limitations

When EPLDs are upgraded, the following guidelines and observations apply:

- If a module is not online, you cannot upgrade its EPLD images.
- If there are two supervisors installed in the switch (Cisco Nexus 9504 and 9508 only), you can either upgrade only the standby supervisor from the active supervisor or upgrade all modules (including both supervisor modules) by using the following commands:
  - `install epld bootflash:image module standby_supervisor_slot_number` (upgrades only the standby supervisor module)
- If there is only one supervisor installed in the switch, your upgrading or downgrading of EPLD images is disruptive.



**Note** After you use this command, you can switchover the active and standby supervisor modules and then upgrade the other supervisor.

- `install epld bootflash:image module all` (upgrades all of the modules)

## Related Documentation

Cisco Nexus 9000 Series documentation is available at the following URL:

<http://www.cisco.com/c/en/us/support/switches/nexus-9000-series-switches/tsd-products-support-series-home.html>

The release notes for upgrading Cisco NX-OS are available at the following URL:



<http://www.cisco.com/c/en/us/support/switches/nexus-9000-series-switches/products-release-notes-list.html>

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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